



United States  
Department of  
Agriculture

National  
Agricultural  
Statistics  
Service

December 1996



# 1996 Agricultural Resource Management Survey (ARMS)

Phase II - Production Practices  
Interviewers Manual

## **THE AGRICULTURAL RESOURCE MANAGEMENT STUDY (ARMS)**

ARMS developed from a combining of the old Cropping Practice Survey (CPS) and the Farm Costs and Returns Survey (FCRS). The initiative to combine these surveys came from:

- A growing interest in tying the resources used in agricultural production and the farm financial information to allow a closer examination of the relationships between various production practices (such as chemical and tillage use) and farm financial conditions;
- The need to improve the efficiency of data collection by combining identical information collected in both the CPS and the FCRS into one survey.

Data collected in the ARMS provides the primary source of information to the U.S. Department of Agriculture on a broad range of issues about agricultural resource use and costs, and farm sector financial conditions. Because of the variety of issues needing to be addressed with ARMS, it was designed with a flexible structure that allows using different questionnaire versions to focus more specifically on topics of interest. For example, commodity versions are used on a rotating basis every 5-6 years so they may focus on resource use and production cost for each commodity. Other versions appear from time to time that focus on specific resource use or financial issues, such as national irrigation use, animal waste management, or risk management strategies such as revenue insurance.

The ARMS is conducted in three phases. The initial phase, which takes place in June, July, and August consists of collecting general farm data such as crops grown, livestock produced, and farm sales. This data is used to screen for farms qualifying for the other phases. With the screening data, we are better able to choose respondents for commodity versions based on whether they had the commodity of interest.

The second phase, conducted in October, November, and December, collects data associated with agricultural production, resource use, and costs-of-production. For the most part, phase II is a combination of the old CPS and the FCRS cost-of-production versions.

Phase III, conducted in February - April, is much like the Farm Operator Resource version of the old FCRS. Data used to examine farm sector financial conditions, such as income, assets, and debt, are collected in phase III. Phase III also includes economic "follow-on" versions to phase II. Respondents to some versions of phase II will be asked to complete a phase III follow-on that includes a shortened set of farm financial, resource use, and cost-of-production questions. It is vital

for both the phase II and III to be completed for each respondent so the link between agricultural resource use and farm financial conditions may be established. This is a cornerstone of the ARMS design.

### **Uses of ARMS Data**

Generally, farmers benefit from the use of ARMS data indirectly. They see the information through contact with extension advisors, in reports issued by State colleges and universities, in farm magazines, newspapers, and on radio or TV spots. Most respondents probably do not realize the data came from this study.

Farm organizations, commodity groups, agribusiness, Congress, and the USDA use the information in evaluating the financial performance of farm/ranch businesses and in making policy decisions affecting agriculture. Producer associations and the USDA Farm Service Agency also ask for ARMS data on the costs of production, particularly when developing proposals for the design and operation of commodity programs.

Specifically, the ARMS is conducted to:

- gather information about the relationships among agricultural production, resources, and the environment. ARMS data provide the necessary background information to support evaluations of these relationships. The data are used to understand the relevant factors in producing high quality food and fiber products while maintaining the long term viability of the natural resource base (Phase II).
- determine what it costs to produce various crop and livestock commodities, and the relative importance of various production expense items (Phase II).
- help determine farmers'/ranchers' net farm income and provide data on the financial situation of farm/ranch businesses, including the amount of debt they have. ARMS data provide the only national perspective on the annual changes in the financial conditions of production agriculture. The Bureau of Economic Analysis uses ARMS data to prepare the farm sector portion of the Gross Domestic Product (GDP) for the Nation. If the ARMS data were not available, the Bureau would have to conduct their own survey of farm operators to collect this data (Phase III).

- help determine the characteristics and financial situations of farm/ranch operators and their households, including collecting information on management strategies and their off-farm income (Phase III).

### **Natural Resource Data and Farm Practices**

To guide policy makers in the decision-making process, it is necessary to have reliable information about the production practices used and the relationship of the practices to changes in water quality and changes in the rate of erosion. Decisions will be made with or without data. It is far better to have factual information to guide the decision process. Farm production covers a major share of the natural resources of the country and as policy suggestions concerning how to manage production are put together, a better understanding of the production process can prevent unwise choices.

The agricultural community is currently faced with many complex issues concerning the environment. ARMS data will be useful in addressing some of these concerns. For instance, fertilizer and pesticide data are used to study water quality. Data on production practices such as machinery use and crop rotation help to identify tillage systems and crop residue levels affecting soil erosion. Pesticide data help measure the economic impact on agricultural production from restricted use or cancellation of a pesticide product or to determine the human and environmental risk of continued use. Data measuring the extent and intensity of pesticide use will aid in the development of residue monitoring programs to improve food safety.

### **Cost of Production**

Congress or USDA mandates exist for the development of annual estimates of the cost of producing wheat, feed grains, cotton, peanuts, tobacco, sugar, and dairy commodities. The legislative background on use of cost estimates by Congress are described in Exhibit 1 at the end of this chapter. Three commodity versions of the 1996 ARMS will collect detailed production data from corn, flue-cured tobacco, and cow-calf producers.

Exhibit 4 displays the law mandating costs of production estimates. To assure accurate and reliable estimates, a comprehensive survey is needed to obtain data on production practices and on the amounts of inputs used. Crop and livestock costs and returns estimates provide a basis for understanding changes in the relative efficiency of crop and livestock production and the break even prices needed to cover all costs. The ARMS provides the data needed to develop commodity

accounts showing costs and input use by size and type of farm in different regions of the country. The "commodity account" shows the costs of resources provided by both this operation and any landlords that are involved with producing the specific commodity (see Exhibit 5 for an example of a commodity account).

For several farm inputs, detailed information is needed to estimate commodity costs. Most farm operations produce more than one commodity, such as corn and soybeans. This farm diversity causes special problems in determining commodity costs. For example, seed corn can easily be allocated to commodity costs for corn because it is only used to grow corn. However, machinery such as tractors and implements are usually used for many activities on the farm and costs for a commodity like corn cannot easily be separated from whole farm costs. Therefore, it is necessary to collect detailed data on each field operation in order to estimate machinery costs for the commodity being surveyed.

USDA is also required to update commodity costs annually while the ARMS is conducted for a specific commodity only once every five or six years. With the physical input data from ARMS, such as seed, fertilizer, and chemical use, analysts can update costs using input prices from other annual surveys. For example, state-level seed prices from the NASS prices paid survey can be used with the seeding rates from ARMS to give an updated estimate of seeding expenses in years when the survey is not conducted. To estimate fuel costs in non-survey years, annual fuel prices can be updated while fuel use from the survey year are kept constant. Minor adjustments can be incorporated based on changes in acreage and yields.

### **Farm/Ranch Income**

Collecting farm/ranch production and expense data to develop an estimate of net farm income each year is necessary because both receipts and production expenses change as production and prices change and as farmers/ranchers use more or less of inputs such as fertilizers or chemicals. Since farmers/ranchers buy most of their inputs, data must be collected every year to permit accurate estimates of annual expenses.

Also, commodity prices, and thus cash receipts, change in response to weather, and national or international events. The ARMS is the only national data source for determining the effect of these changes on different types and sizes of operations on an on-going basis.

Drought, flood, hail, insects or outbreaks of disease may impact specific geographic areas while the rest of the country is unaffected. Several parts of the country experienced adverse conditions in

1996. The financial impact of these will be measured by the 1996 ARMS. It is important to be able to monitor the health of the agricultural economy by region, as well as by size and type of operations.

The USDA's estimate of income earned from farming links receipts and expenses associated with the production and sale of agricultural commodities and measures profit or loss over a calendar year. Two measures of farm income are developed. First, a net cash income measure shows the difference between the cash earnings and expenses of the operation. Second, the estimate of net cash income is adjusted to show how depreciation and changes in the operation's crop and livestock inventory affect earnings. This measure of income is called net farm income and is a measure of the operation's profitability.

Components of gross income, such as net rent received and custom or machine work, also change annually as cash and share rents adjust in response to market conditions or government programs. Custom work and machine hire are directly affected by weather and other natural events which are unpredictable. These income items are measured through the ARMS. It is important to collect the detail of expenses and gross income rather than just net income because individual components may change, but leave the total the same. For example, gross income may increase due to increases in prices for commodities, but expenses for feed or fertilizer may go up as well, resulting in stable or possibly even lower net income. With the detail on expense and income items, the ARMS can monitor changes in the sector.

## **Balance Sheets**

Responses to questions about farm assets and debts are used to develop a balance sheet for the farm as well as to provide a variety of financial ratios for use in measuring financial performance.

Changes in the level of income earned affect rates of return and net worth.

Purchases and sales of assets such as buildings, machinery and land, changes in their value, and any associated debt are very sensitive to changes in farm earnings and economic performance as well as to changes in the general economy. The balance sheet can change rapidly from one year to the next and can be adequately monitored only through data collected on an ongoing basis.

This allows concerns about areas of poor financial performance and pockets of potential stress to be identified. The ARMS provides the data necessary to develop annual estimates of the farm operation's assets, debts, equity, capital gains, capital flows, and the rates of return to agricultural resources, and to determine how these items (and farm household finances) change from one year to the next.

## **Financial Situation**

Annual information from the ARMS on receipts, expenses, debts and assets is needed to evaluate the financial condition of farm businesses. The Office of the Secretary of Agriculture, Congress, agricultural groups, and the public look to NASS and the Economic Research Service (ERS) for reliable, up-to-date information on the financial performance of farms/ranches by size, type and region.

One concern is financial condition, which involves the ability of an operation to pay bills as they come due. The ability of a farm business to meet financial obligations depends on the amount of debt owed by the farm and the amount of cash receipts and other income available to meet mortgage, interest and other obligations of the farm. Being able to pay operating costs and the interest and principal due on debts can change very rapidly in response to drought, flood or other circumstances. The ARMS provides the data to assess the extent and seriousness of financial problems facing farmers, including the likely consequences of recurring financial stress.

## **Use of ARMS for Parity Prices**

ARMS information on farm expenses helps determine the relative importance of production inputs used by farmers. These data are used to update the prices paid index for commodities, services, interest, taxes and wage rates, known as the parity index. This index is used to help determine the parity price for over 100 agricultural commodities.

Parity prices have been a part of farm legislation for over 50 years. (See Exhibit 2 at the end of this chapter.) In 1938, the Agricultural Adjustment Act established that parity prices be computed for agricultural commodities. For example, parity prices currently determine the support prices for tobacco and quota peanuts.

## **Operator Household's Situation**

Operators and their households are of special interest for policy purposes because they incur the risks of farming and most strongly feel the effects of government agricultural policies. Farmers are the most unique resource in U.S. Agriculture. Most of the farms in the U.S. are organized along the traditional lines of one family, or one extended family, operating the farm. However, many farms are operated by operators whose household does not receive all of the profit (or loss) from

the production of the commodities raised by the business. This is especially true for farm operators than have production contracts. In addition, the majority of U.S. farms are small and, on average, lose money farming. Some of these farms have healthy balance sheets and others do not. Understanding the complex relationships between the farm business and the farm operator household, as well as farm work versus off-farm work, is necessary to understand the conditions in U.S. Agriculture today.

Unlike in the years before 1970, we cannot assume that farm/ranch operators and their households depend solely on the income from the farm/ranch business. Off-farm work is critical to the financial well-being of many farm households, and even the households of large commercial farms can have substantial off-farm income. According to past surveys, the following are true of farm operators and their households:

- ! 90 percent of all households have at least one member who receives some off-farm income.
- ! 60 percent of all farm operator households had a member who earned income from off-farm wages or salary.
- ! 44 percent of farm operators have a non-farm occupation as their major occupation.
- ! 20 percent of farm operator households received more income from the farm than off the farm.
- ! the average household income of farm operators is similar to that of the average U.S. household.

Policy makers need to know that an increasing number of farm households are having to resort to off-farm employment in order to sustain the farming enterprise. Current economic conditions, coupled with the geographic isolation which often exists for farm households, pose serious obstacles for the farm household which would like to maintain its farm lifestyle by earning more stable off-farm income. The ARMS is the only national data source that provides the type of information necessary to study these nontraditional financial conditions of farmers.

## Management Practices

Since 1994, we have asked a series of management questions in the FOR version of the FCRS questionnaires. We will continue asking these types of questions in the ARMS. With the change in agricultural policy enacted in the Federal Agriculture Improvement and Reform Act of 1996, farmers will be exposed to increased level of market risk. In the 1996 legislation, commodity safety-net programs which were intended to stabilize supplies and prices through Acreage Reduction Programs and deficiency payments were eliminated for most commodities. These payments have been replaced by fixed and declining Production Flexibility Payments, scheduled to end in 2002. The legislation also specifies the USDA to monitor, analyze, and report problems encountered by farmers and the sector in adjusting to the new policy. Timely design and testing of risk management policies is a responsibility of the USDA. To meet these responsibilities requires increased knowledge of farmers' abilities and willingness to bear the heightened economic risks, and data from the ARMS will allow us to do so.

### **Publication of ARMS**

NASS publishes two reports from the ARMS. The first one is called Agricultural Chemical Usage - Field Crops. This report will be released in April 1997. It will show acreage treated with fertilizer and chemicals and total amounts applied. The second report is called, Farm Production Expenditures. The 1996 survey results will be released in July 1997. It will show expenditures for the U.S., 10 farm production regions, 5 U.S. economic sales classes, and U.S. crop and livestock farms.

Most State offices carry information from these two reports in their State publications.

ERS prepares state, regional, and national reports. These reports show operating and financial characteristics by type of farm, and by income and debt/asset categories. The reports are available to NASS State Offices for publishing the information in State releases.

ERS publishes a number of reports which depend on data from the ARMS:

Annual Report to Congress on the Status of Family Farms

(See Exhibit 3 at the end of this chapter for this report's legislative background.)

Financial Performance of U.S. Farm Businesses

Farm Operating and Financial Characteristics

Characteristics of Farms with Sales of \$50,000 or more

U.S. "Commodity" Production Costs and Returns , 1995: An Economic Base book

The Economic Well-Being of Farm Operator Households

National Financial Summary

Productivity & Efficiency Statistics

ARMS expense, income and financial data are used in the "Farm Business Economics Report" publication which includes the State and National financial summary and costs of production.

ARMS data are also used to develop USDA's Agricultural Income and Finance Situation and Outlook report.

## Exhibit 1

### Legislative Background of Cost Of Production (COP) Estimates

- 1973 Cost of Production Study (see Exhibit 4)
- 1977 COP estimates were to be used directly in adjusting target prices for wheat, corn, cotton, and rice.
- 1978 Emergency Farm Act modified 1977 Act to provide that when set-aside programs were in effect the adjustment in target prices was to be based on costs of set-aside.
- 1981 COP estimates were to be used only indirectly as guides to adjusting target prices for wheat, corn, cotton, and rice; for peanuts, COP estimates were to be used directly in setting support levels.
- Established a National Agricultural Cost of Production Standards Review Board composed of 11 members appointed by the Secretary. Seven members are farmers who produce at least one major commodity, three members have extensive knowledge of production costs by virtue of their training and experience, and one member represents the Department. The responsibility of the Board is to review the adequacy, accuracy, and timeliness of the COP methods used by the Department.
- 1985 COP estimates are to be used in establishing support levels for peanuts. If a wheat marketing quota is established, COP estimates are to be used to set loan rates and target prices. COP estimates are to be used as guides to establishing support levels for sugar.
- 1990 Cost of Production Review Board extended with modifications to membership requirements.
- 1995 Cost of Production review board authorization expired September 30, 1995.

## Exhibit 2

### References to Parity in Statutes Currently in Effect

Agricultural Adjustment Act of 1933, as reenacted and amended by the Agricultural Marketing Agreement Act of 1937: Sec. 2 (7 USC 602) & Sec. 8 (7 USC 608c) - Requires price parity comparisons in administering marketing orders for agricultural commodities.

Agricultural Adjustment Act of 1938, as amended: Sec. 301 (7 USC 1301) - Defines terms related to parity.

Agricultural Act of 1949, as amended:

Sec. 106 (7 USC 1445) - Sets tobacco price support level.

Sec. 201 (7 USC 1446) - Sets honey price support level.

Sec. 401 (7 USC 1421) - Authorizes price support programs.

Agricultural Act of 1954, as amended: Sec. 703 (7 USC 1782) [The National Wool and Mohair Act of 1954] - Sets wool and mohair price support levels.

Foreign Assistance Act of 1961, as amended: Sec. 604 (22 USC 2354) - Prevents procurement of any agricultural commodity or product outside the United States when its domestic price is less than parity.

Food and Agriculture Act of 1977: Sec. 1002 (7 USC 1310) - Establishes loan levels at 90 per cent of parity for certain agricultural commodities when commercial export sales are suspended because of short supply determinations.

Agriculture and Food Act of 1981:

Sec. 007 (7 USC 4103) - Authorizes review of parity formula by the National Agricultural Cost of Production Standards Review Board.

Sec. 1204 (7 USC 1736j) - Sets price support at 100 percent of parity when national security or foreign policy interests mandate an agricultural export embargo.

**Exhibit 3**

**Annual Report to Congress**

United States Code, Title 7, Chapter 55.

2266. Congressional reaffirmation of policy to foster and encourage family farms ; annual report to Congress

- (a) Congress reaffirms the historical policy of the United States to foster and encourage the family farm system of agriculture in this country. Congress believes that the maintenance of the family farm system of agriculture is essential to the social well-being of the Nation and the competitive production of adequate supplies of food and fiber. Congress further believes that any significant expansion of non-family owned large-scale corporate farming enterprises will be detrimental to the national welfare. It is neither the policy nor the intent of Congress that agricultural and agriculture-related programs be administered exclusively for family farm operations, but it is the policy and the express intent of Congress that no such program be administered in a manner that will place the family farm operation at an unfair economic disadvantage.
- (b) # (1) In order that Congress may be better informed regarding the status of the family farm system of agriculture in the United States, the Secretary of Agriculture shall submit to Congress, by July 1 of each year, a written report containing current information on trends in family farm operations and comprehensive national and State-by-State data on non-family farm operations in the United States.
- # (2) The Secretary shall also include in each such report -
  - " (A) information on how existing agricultural and agriculture-related programs are being administered to enhance and strengthen the family farm system of agriculture in the United States;
  - " (B) an assessment of how tax, credit, and other current Federal income, excise, estate, and other tax laws, and proposed changes in such laws, may affect the structure and organization of, returns to,

and investment opportunities by family and non-family farm owners and operators, both foreign and domestic;

- " (C) identification and analysis of new food and agricultural production and processing technological developments, especially in the area of biotechnology, and evaluation of the potential effect of such developments on -
  - Q (I) the economic structure of the family farm system;
  - Q (ii) the competitive status of domestically-produced agricultural commodities and foods in foreign markets; and
  - Q (iii) the achievement of Federal agricultural program objectives;
- " (D) an assessment of the credit needs of family farms and the extent to which those needs are being met, and an analysis of the effects of the farm credit situation on the economic structure of the family farm system;
- " (E) an assessment of how economic policies and trade policies of the United States affect the financial operation of, and prospects for, family farm operations;
- " (F) an assessment of the effect of Federal farm programs and policies on family farms and non-family farms that -
  - Q (I) derive the majority of their income from non-farm sources; and
  - Q (ii) derive the majority of their income from farming operations; and,
- " (G) such other information as the Secretary considers appropriate or determines would aid Congress in protecting, preserving, and strengthening the family farm system of agriculture in the United States.

**Exhibit 4**

**Cost of Production Study**

United States Code, Title 7, Chapter 35A, Subchapter II

1441a. Cost of production study and establishment of current national weighted average cost of production

The Secretary of Agriculture, in cooperation with the land grant colleges, commodity organizations, general farm organizations, and individual farmers, shall conduct a cost of production study of the wheat, feed grain, cotton, and dairy commodities under the various production practices and establish a current national weighted average cost of production. This study shall be updated annually and shall include all typical variable costs, including interest costs, a return on fixed costs, and a return for management.

**Exhibit 5**  
**Example of a Commodity Account**

Table 1--U.S. corn production **cash** costs and returns, 1994 (dollars per planted acre)

Gross value of production (excluding direct Government payments):	
Corn	296.32
Total, gross value of production	296.32
Cash expenses:	
Seed	22.67
Fertilizer, lime, and gypsum	46.07
Chemicals	25.22
Custom operations 1/	10.05
Fuel, lube, and electricity	18.96
Repairs	16.13
Hired labor	7.54
Other variable cash expenses 2/	.44
Total, variable cash expenses	147.08
General farm overhead	13.49
Taxes and insurance	20.68
Interest	15.96
Total, fixed cash expenses	50.13
Total, cash expenses	197.21
Gross value of production less cash expenses	99.11
Harvest-period price (dollars/bu.)	2.07
Yield (bu./planted acre)	143.15

U.S. corn production **economic** costs and returns, 1994 (dollars per planted acre)

Gross value of production (excluding direct Government payments):	
Corn	296.32
Total, gross value of production	296.32
Economic (full ownership) costs:	
Variable cash expenses	147.08
General farm overhead	13.49
Taxes and insurance	20.68
Capital replacement	32.96
Operating capital	3.43
Other nonland capital	13.32
Land	66.48
Unpaid labor	24.03
Total, economic costs	321.47
Residual returns to management and risk	-25.15
Harvest-period price (dollars/bu.)	2.07
Yield (bu./planted acre)	143.15

1/ Cost of custom operations, technical services and commercial drying. 2/ Cost of purchased irrigation water.

**NOTES**

Enumerators working on the ARMS should be familiar with the definitions of the terms listed below. To gain the most benefit from training, enumerators should review the definitions of these terms before attending the State ARMS training workshop. Appendix A of the "Interviewer's Manual" should serve as a reference for many of the definitions. An asterisks after a term indicates the term will not be found in the "Interviewer's Manual" but is defined at the end of this chapter. Descriptions of irrigation systems are also provided in the "Interviewer's Manual" at the end of Appendix H. Those systems not described in that appendix have been described in this manual (Section I, Chapter 5). Check the index located at the conclusion of this manual to identify where these terms may be used in this manual.

**Production Practices and Costs:**

actual nutrients	cost of production
ALS herbicides *	cropland
ALS resistance *	crop insurance *
animal unit (AU)	crop rotation
animal unit month (AUM)	cull
auction pool	
	date, due
beneficial insects *	date, mailing
Bt *	date, reference
	date, release
carousel transplanter *	defoliant
carryover	direct sales
cattle on shares *	double crop
check-off	drip irrigation
commission charges	dryers
commodity	batch *
confidentiality	bin *
conservation tillage	continuous flow *
contract	drying
contract, marketing	aeration *
contract, production	high temperature *
contract sale	low temperature *
contractee	
contractor	editing
contour farming *	EIN
Cooperative State Research, Education, & Extension Service (CSREES)	electronic information service
	expenses, production

Chapter 2  
Terms & Definitions

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fallow	mail maintenance system (MMS)
farm	micronutrient
feeder	military time
fertilizer	
fertilizer analysis	N-P-K
field	name & address master
finish	Natural Resources Conservation Service (NRCS) *
forage	nitrogen (N)
fringe benefits *	nitrogen crediting
fungicide	nonresponse
	no-till *
gallons per minute *	
grassed waterways *	on feed
grazing allotment	operator
grazing association	out-of-business
grazing fee	
greenhouse	partner
gypsum	permanent pasture *
	pesticide
harvested acres	pheromone lures *
hay	phosphate (P)
highly erodible land (HEL) *	plant tissue test *
herbicide	potash (K)
hundredweight (cwt)	power-take-off (PTO)
	purchased water *
idle land	
implement	questionnaire
improvements	
inaccessible	rangelands
input	record status code
input provider *	refusal
insecticide	rent
integrated pest management	rent, cash
irrigation set *	rent, share
	respondent
landlord	
lime	sample, list

sample, multi-frame  
sample, probability  
sampling frame  
sampling unit  
scouting\*  
seed  
set-aside  
software  
solar power  
SSN  
state EIN  
stocker cattle\*  
straw  
strip cropping\*  
sub-irrigation\*  
surface water sources\*  
surfactant  
survey  
survey period  
survey, statistically defensible

tank mix\*  
terraces\*  
tobacco bin/boxes\*  
tobacco trailer\*

underground outlets\*

wages  
water rights  
wetting agent  
work, agricultural  
work, contract  
work, custom  
work, service  
worker  
well casing\*  
wetlands\*

Chapter 2  
Terms & Definitions

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ALS (acetolactate synthase) herbicides	Herbicides that bind to the ALS enzyme in the plant.
ALS resistance	Resistance is caused by a modified ALS enzyme that no longer allows herbicide binding at the site of action. When a modified ALS enzyme has been identified, the enzyme is likely to be resistant to other ALS inhibitor herbicides as well.
Beneficial insects	Natural insect enemies used to control important insect pests.
Bt (Bacillus Thuringiensis)	A bacterial organism which causes fatal diseases in specific insect pests when ingested. Several varieties of the bacteria are available to control a number of target pests on corn, cotton, fruits, vegetables, and many other crops. The Bt varieties control European corn borer, cotton bollworm, army worm, tobacco budworm, loopers, gypsy moth, and many other foliar eating larvae when applied at appropriate insect development stages. In addition, some new varieties of corn contain natural genes and genes produced from the soil bacteria Bt to give them host plant resistance to certain insect pests.
Carousel transplanter	A flue-cured tobacco transplanter which has a carousel or circular attachment to assist workers in handling the transplants.
Cattle on shares	An arrangement very similar to a production contract. Typically a cattle owner (like a contractor) will place cattle on a operation with excess grazing land (like a contractee), and the land owner will receive a share of the calves as the fee for grazing the cattle.
Contour farming	The practice of performing tillage operations and planting crop rows across the slope of the land. Furrows, crop rows, and wheel tracks across the slope act as miniature terraces which detain water, resulting in increased infiltration.
Cooperative State Research, Education & Extension Service (CSREES)	A USDA agency providing leadership, coordination, and evaluation to farmers and rural people in support of state and county educational programs. It provides access to ag research and information on federal regulations and policy, food safety, ag

	marketing, disaster awareness, sustainable agriculture, waste management, water quality and youth at risk. The agency formerly called Extension Service is now a part of CSREES.
Crop insurance	Any Federal, state, or private insurance (multi-purpose or specific to hail or wind).
Dryers, Batch	Facilities outside of a bin into which a batch of wet grain is added and dried. The batch dryer is then emptied and another batch is added. These dryers are used almost exclusively with high temperature drying but may also be used for cooling.
Dryers, Bin	Facilities attached to a grain bin which dry grain added to the bin. Bin dryers are commonly used with both high and low temperature drying as well as aeration.
Dryers, Continuous Flow	Facilities outside a bin in which wet grain is continuously added at the top and is dried as it moves down through the facility. These dryers are used almost exclusively for high temperature drying although they may have stages where the grain is cooled.
Drying, Aeration	Involves no heating; just the removal of moisture by blowing air through the grain.
Drying, High Temperature	Removing of the moisture by blowing air heated 100 - 200 degrees through the grain. If the air blown through the grain is heated to 25 or more degrees above the temperature around the dryer, the drying method should be considered high temperature.
Drying, Low Temperature	The use of fans to blow air (heated to 5 - 10 degrees higher than the temperature around the dryer) through the grain.
Fringe benefits	Employer provided cash payments for such items as health insurance, life insurance, holiday pay, vacation pay, sick leave, time-off with pay, Workers' Compensation, employer's share of Social Security and Medicare, pensions and retirement plans.

## Chapter 2 Terms & Definitions

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Gallons per minute	A water flow-rate measurement. The quantity of water flow (or pumped) during one continuous minute measured in gallon units.
Grassed waterways	Water drainage channels located in a field, often shaped or graded, with a permanent vegetative cover established. Include channels used as outlets for terraces and for the disposal of runoff from diversion channels, stabilization structures, contoured rows, and natural depressions.
Highly erodible (HEL land)	Erodibility is a function of rainfall, soil erodibility, field slope, and length. NRCS uses these characteristics and a measure of soil loss tolerance to construct an erodibility index. If the Index is greater than 8 the field is highly erodible.
Input provider	The company or individual selling or contributing products used in the production of agricultural commodities.
Irrigation set	The area of the field irrigated by an irrigation system as it moves across a field while not ceasing operation.
Natural Resources Conservation Service (NRCS)	A USDA agency charged with the national soil and water conservation program in cooperation with landowners, operators, other land users, developers, community planning agencies, and other local, state and federal agencies. The Agency called Soil Conservation Service is now part of the NRCS.
No-till	The soil is left undisturbed from harvest to planting except for the injection of nutrients. Planting is completed in a narrow seedbed or slot created by coulters, row cleaners, disk openers, in-row chisels or roto-tillers.
Permanent pasture	Pasture planted and established with perennial or self-seeding annual plants that have been maintained through several years of grazing.
Pheromone lures	Insects of the same species can communicate with one another by releasing small quantities of chemical substances from their bodies

into the air. These distinct scents, called pheromone, attract others to the source of the scent. Because the chemical composition of the pheromone differs from species to species, the attraction of an insect's pheromone is specific to that species alone. Researchers have been able to chemically identify many of these individual pheromone and duplicate them. As a result, it is now possible to attract certain insects by using these synthesized pheromone, enabling us to disrupt them from their normal behavior.

Plant tissue test

Plant tissue analysis provides information on how the plant is using particular nutrients and can give important clues for deciphering nutrient deficiency or excess problems

Purchased water

Water is considered purchased if the

operator and/or landlord paid a fee for water used on the selected field and the water originates from an off-farm source. Even if an

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irrigation district, water-supply ditch association, or canal company does not charge a water fee, but only charges the producer for the cost of water delivery or for the maintenance cost of water delivery facilities, report the water as purchased water.

Scouting

A process of checking a field for the presence of weeds, insects, or diseases and gathering information about pest population levels, activity, size and/or density.

Stocker cattle

Cattle being backgrounded prior to finishing. In many parts of the country these are referred to as yearling cattle.

A process where cultivated crops, typically row-crops and close growing crops,

Strip cropping  
such as grasses, are planted in alternate strips

across the slope of the land. The water runoff from the cultivated

	crop is slowed by the close growing crop, resulting in greater moisture absorption and deposition of sediment.
Sub-irrigation	Maintenance of a water table at a predetermined depth below the field surface by using ditches or sub-surface drains and water-control structures
Surface water sources	Water stored in natural ponds or lakes, flowing in streams and rivers, and water stored in man-made reservoirs
Tank mix	Two or more pesticide products mixed in the spray tank by the farmer/custom applicator immediately before application and applied to the field as a single treatment.
Terraces	Raised level areas of a field supported on one or more sides by a wall or bank of turf. Terraces are usually classified according to the method of runoff disposal, the shape of the terrace cross section, or by the alignment between terraces.
Tobacco bin/box	A large metal or wooden container in which the flue-cured tobacco is placed and cured. Some designs allow the bins or boxes to be setup so tobacco can be cured by attaching a curing furnace as the last bin. Other designs require the boxes to be placed inside a curing bin.
Tobacco trailer	A flatbed trailer used to haul the flue-cured tobacco leaves out of the field to the barn. A trailer could haul leaves that are looped and attached to sticks in stacks, in racks with the racks on the trailer, or in boxes on the trailer.
Underground outlets	Systems of water runoff control carrying water through an underground pipe to disposal areas. The underground outlet consists of vertical intake risers carrying water to an underground outlet conduit such as tile drainage.
Water sources include only surface water	Water sources and/or ground water. Surface water consists of water stored in natural ponds or lakes, water that flows in streams and rivers, and

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water stored in man-made reservoirs.

Surface water may originate on farm, but also includes all water supplied by an off-farm water supplier. Ground water is water stored beneath the ground surface in aquifers. Water pumped from on-farm wells is ground water.

The outer metal or concrete liner of an in ground well. Within the well casing will be the pipe through which the water is pumped.

**Well casing**  
**Wetlands**

Areas inundated or saturated by surface or ground water at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions. This is the normal condition of the soil.

**Yield map**

A map prepared from data collected by a yield monitor attached to harvesting equipment.

A yield map shows variation in yields for small areas within a field and is a key component in the detailed planning inherent in precision farming.

**Yield monitor**

A monitor mounted on harvesting equipment that measures yields continuously as the harvester moves through a field. These yield measures can be tied to specific locations in the field through GIS and converted into yield maps. Such yield maps can then be compared with the fertilizer or pesticide application map, and used to customize a new application map for the next season.



This chapter provides an overview of the questionnaire and other materials for the ARMS, and general guidelines for collecting data. Administrative matters are covered in the NASDA Enumerator Handbook.

**You will receive the following from your State Office:**

- Copies of pre-survey publicity letters mailed to each respondent
- Copies of the publicity brochure
- Questionnaires with labels identifying the assigned operations
- A few questionnaires without labels
- Screening Report from the Screening Survey conducted during the summer of 1996
- Respondent Booklets containing code tables and a burden statement
- Calendar/Target Pest Showcard
- Supplements for any questionnaire(s) you are assigned
- County maps for recording field locations
- Maps, photos, and other materials for enumerating the special Natural Resources Conservation Service (NRCS) samples
- Envelopes for mailing completed questionnaires
- Several copies of NAS-011 (Time, Mileage, and Expense Sheet) and envelopes for mailing them
- (Other materials may also be provided by your State Office)

**You should have these materials on hand:**

- Interviewer's Manual
- Highway and/or street maps
- Black lead pencils
- Name tag
- NASDA Identification Card
- NASDA Enumerator Handbook
- Ball point pen for completing NAS-011

You will need to use a calculator for this survey; a clipboard may also be handy.

## QUESTIONNAIRE VERSIONS

Nine QUESTIONNAIRE versions will be used in this year's Fall interview of the ARMS. The names, version numbers, and paper colors of each version appear in EXHIBIT 1 below.

**EXHIBIT 1:**  
**ARMS QUESTIONNAIRE VERSION NAMES, NUMBERS, AND COLORS**

<b>VERSION NAME</b>	<b>VERSION NUMBER</b>	<b>COLOR</b>
Corn Production Practices and Costs Report	2	Buff
Flue-Cured Tobacco Production Practices and Costs Report	3	Blue
Cow-Calf Production Practices and Costs Report	4	Blue
Corn Production Practices Report	5	White with Blue Ink
Soybean Production Practices Report	6	Green
Wheat Production Practices Report	7	Yellow
Cotton Production Practices Report	8	Salmon
Potato Production Practices Report	9	Salmon
Crop Production Practices Report (Multi-crop)	10	White

Version number 1 has been reserved for the Farm Operator Resource Version of the ARMS spring survey.

*Versions 2, 3, 4, 5, 6, 7, 8, and 9* are used to enumerate information for one target crop or commodity. Samples drawn for *Version 10* have been selected for TWO target crops, so you will collect information for both crops on the *Version 10* questionnaire. If you are using *Version 10* in your state, labels inside the questionnaire will tell you which crops to enumerate. In some states, *Version 10* will also be used for samples for the Natural Resources Conservation Service (NRCS); information for only one target crop will be collected on *Version 10* for these samples. (NRCS sample procedures are explained in Chapter 4.)

Be sure to be familiar with the questionnaire versions being used in your state. Also be familiar with which commodities are the target commodities in your state.

All versions have a Face Page. Some questionnaires will have a Screening Supplement inserted in the questionnaire by the State Office. *Versions 5, 7, 8, 9, and 10* also have special instructions and questions for samples being collected for the NRCS. Chapter 4 of this manual gives instructions for the Face Page, the Screening Supplement, and procedures for the NRCS samples.

All the remaining sections are identified by both letter and title. The letter and title pairings do not change. For example, Section F is always "Pesticide Applications -- Selected Field" and the topic "Pesticide Applications -- Selected Field" is always covered in Section F. However, the amount of detail asked in a section may vary from one questionnaire version to another. These sections are discussed in Chapter 5. Most of them appear in more than one questionnaire version and some appear in every version. Although this approach makes for a more lengthy chapter, it greatly reduces the duplication that would result from discussing each questionnaire in separate chapters. To help you find instructions, dividers are provided at key intervals, and the letter of the section discussed on a page is shown at the bottom of the page along with the chapter and page number (i.e. A-5001).

### **Respondent Booklets**

Seven RESPONDENT BOOKLETS have been prepared to use with the questionnaires listed in EXHIBIT 1. Which respondent booklet you use depends on the questionnaire version. The Respondent Booklets, the questionnaire version to use them with, and their paper colors appear in EXHIBIT 2 on the next page.

**EXHIBIT 2:  
RESPONDENT BOOKLETS AND QUESTIONNAIRE VERSION NUMBER TO BE USED WITH**

<b>RESPONDENT BOOKLET</b>	<b>TO BE USED WITH QUESTIONNAIRE VERSION :</b>	<b>BOOKLET COLOR</b>
Corn	2, 5, or 10	Buff
Flue-Cured Tobacco	3	Blue
Cow-Calf	4	Blue
Soybeans	6 or 10	Green
Wheat	7 or 10	Yellow
Cotton	8 or 10	Salmon
Potatoes	9 or 10	Salmon

There is not a single Respondent Booklet specifically for *Version 10*. If you are using *Version 10* for a sampled operation for which two crops are to be enumerated, you will need Respondent Booklets for both crops. For example, if you are using *Version 10* for a sampled operation drawn for both soybeans and cotton, you will need to take with you a Soybean Respondent Booklet and a Cotton Respondent Booklet.

If you are using *Version 10* for an NRCS sample, you will need to take with you Respondent Booklets for each of the target crops in your state. This is because you will not know before you contact the operator which crop you will be enumerating. (Special instructions for the NRCS samples appear in Chapter 4.) For example, for each NRCS sample in Minnesota, you will need a *Version 10* questionnaire and one Respondent Booklet each for Corn, Soybeans, Wheat and Potatoes.

The Respondent Booklets contain information that respondents will need for answering some of the survey questions, such as Code Lists and more detail on some items. In many cases, this information does not appear in the questionnaire.

The purpose of the Respondent Booklets is to **help** the respondents in answering the questions. Use of the Respondent Booklets can save confusion and interview time.

In some cases, you may need to help the respondents become familiar with how to use the booklet. This is especially important when using the longer Code Lists, such as Chemicals and Pesticides, and Machinery and Implements. Take a minute when you first turn to these pages to show them how to look things up in the booklet. This should help the interview go more quickly.

Some lists in the Respondent Booklets are there to let the respondent know what types of items we are looking for in response to certain questions. For example, in Section E or F, when you ask the respondent "How was this (fertilizer or pesticide) product applied?", show the respondent the Fertilizer/Pesticide Application Method Code List printed in the Respondent Booklet. Then the respondent will know what categories we're interested in. Otherwise the respondent may explain in detail how the material was applied, which will take additional time, when all you really wanted to know was that the material was "banded in the row" (method code 7).

Another example is use of the Cow-Calf Respondent Booklet for completing *Version 4* COW-CALF PRODUCTION PRACTICES AND COSTS REPORT. Most of the Code Lists printed in the Respondent Booklet are also printed in the questionnaire. This is so you can more easily verify respondents' answers to questions using the Code Lists in the Respondent Booklet. It is important that the respondents be able to look over the items listed when selecting answers to questions. For example, respondents may not know how to classify their "pasture land" or "forage type" in the Section Q questions if you do not show them the classifications we're interested in by using the Code Lists in the Respondent Booklet.

### **Calendar/Target Pest Showcards**

Two CALENDAR/TARGET PEST SHOWCARDS have been prepared to use with questionnaire *Versions 2, 5, 6, 7, 8, 9, or 10*. The WHITE showcard displays a calendar containing the months July, 1995, through December, 1996, and is to be used when enumerating Corn, Soybeans, Cotton, Potatoes, Durum Wheat, or (Other) Spring Wheat. The YELLOW showcard displays a calendar containing the months July, 1994, through July, 1996, and is to be used when enumerating Winter Wheat with *Version 7 or 10*. Both Showcards display the Target Pest Code List for use with all these crops.

Many dates are asked in these versions: planting date, fertilizer and pesticide application dates, and dates of field operations. Some operators have good records of these dates. For other operators, the CALENDAR SHOWCARD will be helpful in jogging their memories about when these activities were done.

The Calendar and the Target Pest Code List were printed on a separate SHOWCARD because they are needed at the same time as Code Lists in the Respondent Booklet for answering some questions. For example, you will need the Pesticide Code List, the Fertilizer/Pesticide Application Methods Code List, the Calendar, and the Target Pest Code List for completing the Pesticide Application Table in Section F. Having the Calendar and the Target Pest Code List on a separate Showcard makes it easier to look at all of these lists at the same time. If they were all printed in the Respondent Booklet, you could get lost flipping back and forth among several pages.

### **Respondent Burden**

Be thoroughly familiar with each questionnaire version you will be using and the instructions for it so you won't waste the respondent's time.

Follow skip instructions to avoid asking questions needlessly. If no skip instructions appear after an item, continue with the next item.

Also be aware of the estimate of average completion time in the Burden Statement for each version. Since ARMS is a new survey this year, the estimated average completion time is based on the length of pretest interviews and the judgement of NASS and the Office of Management and Budget (OMB). (The OMB is an agency that approves all surveys conducted by the federal government.) The expected average interview length for each questionnaire version appears in EXHIBIT 3 on the next page.

**EXHIBIT 3:  
EXPECTED INTERVIEW LENGTHS BY QUESTIONNAIRE VERSION**

<b>VERSION NAME</b>	<b>VERSION NUMBER</b>	<b>EXPECTED AVERAGE INTERVIEW LENGTH</b>
Corn Production Practices and Costs Report	2	75 minutes
Flue-Cured Tobacco Production Practices and Costs Report	3	90 minutes
Cow-Calf Production Practices and Costs Report	4	60 minutes
Corn Production Practices Report	5	40 minutes
Soybean Production Practices Report	6	40 minutes
Wheat Production Practices Report	7	40 minutes
Cotton Production Practices Report	8	40 minutes
Potato Production Practices Report	9	40 minutes
Crop Production Practices Report (Multi-crop)	10	70 minutes for two crops; 40 minutes for NRCS samples

Burden Statements are printed on the back cover of the Respondent Booklet used with each questionnaire version. At the end of the interview, call the respondent's attention to the burden statement on the Respondent Booklet for that questionnaire version. Respondents who have questions or comments about the Burden Statement or paperwork reduction should send them to the OMB. The mailing address is shown in the burden statement.

The Burden Statement printed on the Corn Respondent Booklet lists the expected interview completion time for *Version 2* separately from that for *Version 5*.

Since *Version 10* does not have its own separate Respondent Booklet, you will use the Burden Statements from two Respondent Booklets for samples drawn for two crops.

However, we expect the average interview length for *Version 10* to be shorter than for two single crop Production Practices Reports (2 x 40 = 80 minutes), because of being able to collect information about both target crops at the same time.

### Questionnaire Format

The following formatting conventions apply to the ARMS questionnaires:

- A. Enumerator instructions are printed in italics and enclosed in brackets.

#### Example A Enumerator instructions

6. [*Ask only if HERBICIDES (pesticide codes 4000 - 4999) were entered in Section F, item 1 column 2; else go to item 11.*]

Did you apply herbicides to this field BEFORE weeds emerged?

YES - [*Enter code 1 and continue.*]

NO - [*Go to item 8.*] . . . . .

CODE
0243

- B. A special type of enumerator instruction is a fill-in:

B1. When the reference to a previous item number is printed in italics and enclosed in brackets, you should take the data that you just entered in that previous item and use it to FILL IN for the item number when you read the question. In Example B1 below, you would read the question filling in the data entered in Item 1, saying "On what date was the first of the 110 weaned calves born?" when 110 was the figure reported in Item 1.

#### Example B1 Data fill-in

5. On what date was the first of the [*item 1*] weaned calves born? . . . . .

MM DD YY
0052 — — — — —

- B2. Questions in table headers frequently refer to text in the rows that you should use to FILL IN to complete the wording of the question.

**Example B2 Text fill-in**

1	2 How many head of [column 1] are on hand today?  NUMBER	3 How many head of [column 1] were on hand 12 months ago? NUMBER
a. <b>REPLACEMENT HEIFERS</b> . . . . .	0068	0075
b. <b>BEEF COWS</b> , including bred heifers . . . . .	0069	0076

- C. Prompts, "includes and excludes", and other instructions for respondents are also printed in italics but enclosed in parentheses. Read these only when needed.

**Example C Instructions for respondents**

8. Was manure applied to this field for the 1996 corn crop?  
(*Exclude commercially prepared manure.*)

CODE

YES - [*Enter code 1 and continue.*]  NO - [*Go to item 9.*] . . . . . 0176

- D. Optional wording for items or questions is shown in plain print enclosed in parentheses.

**Example D Optional Wording**

3. How many head (or what percent) of the weaned calves were (or will be) implanted with growth implants? . . . . .
- PERCENT  
0049
OR
NUMBER  
0050

- E. Office-use boxes are printed with thick solid lines in dark type (boldface).

**Example E Office Use Boxes**

1. I need to locate the selected field of corn on this map.

What county is the selected corn field in?

OFFICE USE-- COUNTY FIPS CODE
0021

F. Item code boxes for interviewer use are generally printed with thin solid lines.

**Example F Item code boxes for interviewer use**

13. What was the cost per unit of the **purchased** seed for this field?  
(**Include** landlord's cost.) . . . . .

DOLLARS AND CENTS PER UNIT	UNIT CODE 1=APPROX. 80,000 KERNEL BAG 2=POUNDS 4=BUSHELS
0068 . _ _	0069

G. Some item code boxes have a printed decimal point followed by 1 or 2 marked spaces. They show that the data should be reported to the tenth or hundredth place. When entering data into these cells, locate the number correctly in relation to the decimal points, and fill in every space printed after them. Fill in zeros when answers are not given to as many decimal places as allowed for, or when answers are given in whole numbers. For example, if a cell has a decimal point followed by one underlined space, responses are supposed to be recorded in TENTHS, and an answer like 40 should be entered as 40.0.

**Example G Item code boxes with decimal points**

1. How many acres of corn did this operation plant in the selected field in 1996? . . . . .

ACRES
0055 . _ _

- H. Some item code boxes are set up for recording dates in MM DD YY format. These cells have six preprinted underlines. MM stands for the two digits that refer to the month, DD is for the 2-digit date for the day, and YY is for the two digits for the year. Sometimes the year is preprinted. Leading zeros are only needed for the DD portion of the date. For example, April 2, 1996, should be entered as \_4 02 96; April 24, 1996, should be entered as \_4 24 96; December 12, 1996, would be 12 12 96; and January 1, 1996, would be \_1 01 96.

**Example H Item code boxes for recording the MM DD YY date**

5. On what date was this field planted?

MM DD YY					
0062	_	_	_	_	96

- I. Boxes made of dot-dash lines in boldface are for data which will be broken down into greater detail in later questions.

**Example I Boxes made of dot-dash lines in boldface**

1. How many acres of corn did this operation plant in 1996 with the intention of harvesting them for grain?  
(**Exclude seed corn.**) .....

TOTAL PLANTED ACRES OF CORN FOR GRAIN					
0045	_	_	_	_	_

2. How many of the [*item 1*] corn acres were--

- a. owned by this operation? .....
- b. rented for CASH? .....
- c. SHARE rented? .....
- d. used RENT-FREE? .....

ACRES					
0046	_	_	_	_	_
0047	_	_	_	_	_
0048	_	_	_	_	_
0049	_	_	_	_	_

[Total must equal  
*item 1.*]

J. **Boxes outlined with dashed lines in boldface** are for totals of previous items or they are for items to be referenced later.

**Example J Boxes outlined with dashed lines in boldface**

1. How many beef calves were weaned (or will be weaned) by this operation on the total acres operated during 1996?

[If fewer than 10 calves weaned, review information on Screening Report. Make notes, then go to item 2 of Conclusion, back page.] . . . . .

NUMBER OF WEANED CALVES
0045

K. For some items, respondents have a choice of two different units for reporting. When two boxes appear for recording the respondent's answer, only one box should be used. The outline of the box indicates which unit, if any, is the preferred unit for reporting:

K1. One box in a pair of boxes has a dotted outline and the other box has a solid outline. The box with the dotted outline is okay, but is less preferred. The box with the solid outline is the preferred cell for reporting.

**Example K1 Boxes with dotted outlines indicate the less preferred unit for reporting**

a. [If field is CASH RENTED, item 2 is 2, ask--]  
What was the cash rent paid (per acre)? . . . . .

TOTAL DOLLARS OR	DOLLARS & CENTS PER ACRE
0057	0058 . _ _

K2. Pairs of boxes with solid outlines indicate both units are equally preferred.

**Example K2 Boxes with solid outlines indicate that both units are equally preferred**

10. What was the TOTAL MATERIALS cost for all fertilizer, soil conditioners, micronutrients, etc. applied to this field for the 1996 corn crop? (**Include landlord costs. Exclude lime or purchased manure. If custom applied, include the cost of materials ONLY, unless materials and application costs cannot be separated. Include materials applied to this field if it was fallow in 1995.**) . . . . .

DOLLARS & CENTS PER ACRE	OR	TOTAL DOLLARS
0188 . _ _		0189

L. There are two formats for YES/NO questions. Answers to YES/NO questions should be recorded the same way in either case. If the answer to a YES/NO question is YES, enter code 1. If the answer is NO, then you must enter a dash in the box to indicate that the question was asked and the respondent answered NO. Since you are not entering a number for NO, this is the only way to indicate that the answer was NO. If the respondent doesn't know whether the answer is YES or NO, then record DK or "DONT KNOW" in notes. If the respondent refuses to answer, then record REFUSED" in notes.

L1. One format for YES/NO questions is to use check boxes. These are used when there is a "GO TO" instruction associated with either the YES or NO answer.

**Example L1 YES/NO check boxes**

8. Did you apply herbicides to this field AFTER weeds emerged?

YES - [Enter code 1 and continue.]  NO - [Go to item 10.] . . . . . 

0248
------

L2. The other format for YES/NO questions is the response code YES=1 printed next to the code box.

**Example L2 YES=1**

21. Have you (the operator) completed courses leading to certification for applying "Restricted Use" pesticides? . . . . . YES = 1 

0286
------

- M. Multiple choice questions are when the respondent must choose only ONE answer from several possible answer choices that you offer. Each response category is given a code number and the group of answer choices are enclosed in a box with a solid outline. When you enter the respondent's answer, you are entering a code number.

**Example M Multiple choice questions with coded response categories**

9. Was one of these pest resistant varieties of seed used in this field--  
[Show respondent Seed Variety Code List in Respondent Booklet.  
Choose one and enter code.]

<p><b>1 an herbicide resistant hybrid or variety</b> (such as Pioneer 3162R, Beck's 6868IRT)?</p> <p><b>2 a Bt variety for insect resistance,</b> (such as Nature Guard or Maximizer with Knockout)?</p> <p><b>3 a gray leaf spot resistant variety?</b></p> <p><b>5 none of these?</b></p>	.....	<table border="1"><tr><td style="text-align: center;">CODE</td></tr><tr><td style="text-align: center;">0066</td></tr></table>	CODE	0066
CODE				
0066				

N. Questions with more than one sub-part are separate questions. The main question or the “stem” of the question is attached to an item number, and the different endings for the question, the sub-parts, are identified with a lower-case letter. Each sub-part is a separate question and must be asked separately. You should read the question stem followed by the ending sub-part associated with the letter. If there are lots of sub-parts, you will probably only need to read the stem for the first two or three sub-parts. Once the respondent understands that the stem is repeated, though unspoken, then you can continue reading only the sub-parts.

**Example N Questions with more than one sub-part**

		CODE
20. Did your land-use practices for this field include--		0117
a. grassed waterways? .....	YES = 1	0118
b. terraces? .....	YES = 1	0119
c. contour farming? .....	YES = 1	0120
d. strip cropping? .....	YES = 1	0121
e. underground outlets such as tile drainage? .....	YES = 1	0122
f. other drainage channels or diversions? .....	YES = 1	

0. In some tables, the direction to go through the table is indicated by an arrow. A vertical arrow pointing down means to go down each column in the table, completing all the rows for the column before moving to the next column. A horizontal arrow pointing right means to complete all the columns for a row before moving to the next row.

**Example O Direction through tables indicated by an arrow**

1 →	2 How many [column 1] did this operation sell?  NUMBER	3 What was the total amount received for sales of [column 1] (net of marketing charges)? DOLLARS	4 What was the average weight per head of the [column 1] sold?  POUNDS
a. <b>FINISHED CATTLE</b> ( <i>from feedlots</i> ) . . . . .	0123	0133	0143
b. <b>CULL BULLS</b> . . . . .	0124	0134	0144

- P. Some tables have columns outlined with bold dot-dash borders. Complete these columns first. After completing as many lines of the bold dot-dash column as are needed, then complete all the columns of the table for each row with data entered.

**Example P Table columns outlined with bold dot-dash borders**

1	2 [Enter number of workers.]	3 <b>Was</b> (worker)--	4 <b>Was</b> (worker)--
<b>WORKERS</b>		1 PAID 2 UNPAID [--Go to column 6.]	1 FULL TIME 2 PART TIME 3 SEASONAL
<input type="checkbox"/> <b>You</b> (the operator)		<b>CODE</b>	<b>CODE</b>
<input type="checkbox"/> <b>Partners</b>	0684		
<input type="checkbox"/> <b>Spouse</b>		0686	0687
	0690	0703	0716
	0691	0704	0717

Q. Skip instructions for one or more columns of a table are placed outside the table above the columns they apply to. Like all other enumerator instructions, they are printed in italics and enclosed in brackets.

**Example Q Skip instructions for column(s) of a table**

1 <i>[Use Harvested Forages Codes.]</i>	2 How much <i>[column 1]</i> was fed to all beef cattle?	3 UNIT CODE  3 TONS 5 BALES 6 STACKS	4 What was the weight of the bales or stacks (in pounds)?	5 What percent of this <i>[column 1]</i> was purchased?	6 What was the TOTAL cost for this <i>[column 1]</i> ?
CODE	NUMBER	CODE	POUNDS	PERCENT	DOLLARS
0255	0262	0269	0276	0283	0290
0256	0263	0270	0277	0284	0291

**How to Use Version 10: MULTI-CROP for 2-crop samples**

In some states, *Version 10*: CROP PRODUCTION PRACTICES REPORT (Multi-crop) questionnaires will be used to collect information for operations that have been sampled for two target crops. The names of each target crop will be printed on the Random Number Labels placed in Section C of the questionnaire for field selection.

After randomly selecting the field for each of the target crops according to the procedures explained in Section C of Chapter 5, you will complete the questionnaire for both of these target crops.

There are some additional questionnaire formatting conventions used in *Version 10* to guide your path through the questionnaire, and to help keep the respondent on track. These include:

R. Text fill-ins: Fill in the name of the target commodity when you see the [*commodity*] notation.

**Example R - Version 10 Text fill-ins**

1. How many acres of [*commodity*] did this operation plant in the selected field in 1996? ..... ACRES

S. Units for reporting the answer appear to the left of the answer boxes instead of above them.

**Example S - Version 10 Units for reporting the answers**

1. How many acres of [*commodity*] did this operation plant in the selected field in 1996? ..... ACRES

CORN	SOYBEANS	COTTON
0055 .....	1151 .....	1231 .....

T. Commodity-specific cell boxes: Enter the data for the target commodity in the column of cells labeled with the commodity name in the header. Answer cell boxes for a particular commodity are always in the SAME column position throughout the questionnaire. If a cell is missing in that commodity's column for a particular question, then that question is skipped for the commodity. In example T below, the cell for potatoes is missing in the second row of cells. This means that the question associated with that row of cells would not be asked for potatoes.

**Example T - Version 10 Commodity-specific cell boxes**

CORN	SOYBEANS	COTTON	WINTER OR DURUM WHEAT	(OTHER) SPRING WHEAT	POTATOES
0114	1164	1242	1321	1396	1472
0115	1165	1243	1322	1397	

- U. Questions that are to be asked only for some of the target commodities are indicated by enumerator instructions just before them. Enumerator instructions are printed in italics and enclosed in brackets, as usual. The commodity name(s) for which the question is to be asked appears in bold italics print.

**Example U - Version 10 Crop-specific enumerator instructions**

8. [*For soybeans or wheat, ask--*]  
Was there (will there be) a yield monitor on the equipment used to harvest the [*commodity*] field? . . . . . YES = 1

- V. Arrows are used to indicate the path to the next question for a particular target crop. Sometimes arrows are used to direct the path to the next question when some questions are skipped for a particular crop. Sometimes arrows are used to indicate that you continue to the next question for one crop, but not the others.

**Example V - Version 10 Arrows**

	CORN	SOYBEANS
16. Did you--		
a. have a biological soil analysis done on the [ <i>commodity</i> ] field to detect the presence of soil pests, such as insects, diseases or nematodes? . . . . . YES = 1	0274	1208
b. consider beneficial insects in selecting and using pesticides on the [ <i>commodity</i> ] field? . . . . . YES = 1	0275	1209
c. [ <i>For corn, continue--</i> ] remove weeds in infested areas in this corn field to prevent insect egg laying? . . . . . YES = 1	0276	↓
d. use seed treatments on corn for seedling blight control? . . . . . YES = 1	0277	
e. submit diseased plants from this corn field to a lab for diagnosis? . . . . . YES = 1	0278	
17. Did you--		
a. purchase and release beneficial insects in the [ <i>commodity</i> ] field? . . . . . YES = 1	0279	1210

- W. Skip instructions are placed UNDER the cell boxes where you record responses.

**Example W - Version 10 Skip instructions**

CORN	SOYBEANS	COTTON	WINTER OR DURUM WHEAT	(OTHER) SPRING WHEAT	POTATOES
0166	1176	1254	1333	1408	1482

[For fields with code **YES = 1**, continue. If none are code 1, go to item 5.]

When you are completing *Version 10* for an operation that was sampled for two crops, proceed with the interview by asking each question first for the selected [*commodity 1*] field, then for the [*commodity 2*] field. For some items, such as harvested acreage and yields, you will ask a short series of questions for the selected [*commodity 1*] field, and then ask a similar series for the [*commodity 2*] field.

For many of the questions on *Version 10*, you will be able to “abbreviate” the question somewhat when you ask it for *commodity 2*. For example, an operation has been selected for both corn and soybeans. You may ask Item 14 of Section D for corn first, like this: “Has harvest of the corn field been completed?” Then you immediately follow this question by asking “How about the soybean field?”

Be careful not to use this procedure too much. It will not be possible to use this procedure for EVERY question, because some questions are not so straightforward.

You will need to be sure that the respondent is answering each question for the correct selected commodity field. You may find that it helps the respondent to stay focused on each selected field if you refer to them occasionally during the interview using the same description that the respondent used when first listing the fields for you. For example, when you originally listed the operation’s fields of corn, the respondent described the selected field as “45 acres on Smitty’s.” The respondent described the selected soybean field as “30 acres north of the highway.” Several times during the interview, refer to the selected corn and soybean field using these same words. For example, when you ask Item 1 in Section E, say, “What fertilizers were applied to the 45 acres on Smitty’s for the 1996 corn crop?” Then ask, “What fertilizers were applied to that 30 acres soybean field north of the highway for the 1996 crop?”

This procedure of referring to the fields using the respondent’s words as you alternate between the two target commodities may reduce or avoid confusion for the respondent. It will also reassure you that the respondent’s answers are for the correct field.

As you continue, the respondent will catch on to the procedure, and the interview will go quickly, smoothly, and efficiently.

Be sure you record the response for each question in the cell box for the appropriate commodity. When preparing for each of your *Version 10* interviews, you may find it helpful to circle the crop name headers over the answer boxes for the two target crops you will be enumerating, or highlight them with a colored highlighter pen. This will help you identify the answer cells for recording data for each target crop quickly and easily during the interview.

### How to Use *Version 7*: WHEAT PRODUCTION PRACTICES REPORT

The *Version 7* WHEAT PRODUCTION PRACTICES REPORT questionnaire will be used to collect information for operations that have been sampled for only ONE type of wheat. The name of the target type of wheat will be printed on the Random Number Label placed in Section C of the questionnaire for field selection.

This questionnaire has been set up for recording data for any of the three types of wheat:

	WINTER OR DURUM WHEAT	(OTHER) SPRING WHEAT
1. How many acres of wheat did this operation plant in the selected field in 1996? . . . . . ACRES	1311	1386

Use the **column** of cell boxes labeled for the type of wheat you are enumerating.

The **lefthand** column of cells is labeled for either WINTER or DURUM WHEAT. If you are enumerating WINTER WHEAT for a particular sample in your state, enter responses in this column. If you are enumerating DURUM WHEAT for a particular sample in your state, enter responses in this column. No state is enumerating both these types of wheat.

The **right-hand** column of cells is labeled for (OTHER) SPRING WHEAT. If you are enumerating (OTHER) SPRING WHEAT for a particular sample in your state, enter responses in this column.

Be sure you record the response for each question in the cell box for the appropriate type of wheat.

In North Dakota, both DURUM WHEAT and OTHER SPRING WHEAT are target crops. In Montana, both WINTER WHEAT and SPRING WHEAT are target crops. **DO NOT use *Version 7* for samples**

that have been selected for **BOTH** of these target crops. You must use *Version 10* MULTI-CROP for any operations that have been selected for two target crops. That includes operations selected for two types of wheat.

### Entering Data

Use a black lead pencil to record data and make notes; never use ink on a questionnaire. Make all entries clear and easy to read. Entries in check boxes and item code boxes must be entirely inside the boxes.

Record responses in the unit required (such as acres, bushels, or dollars). If a respondent gives an answer in a different unit, write the answer outside the printed box, convert it to the required unit, and record the converted data in the box. If the answer is "none", enter a dash, and not a zero.

For questions answered with a code number, enter the number that goes with the respondent's answer. If the respondent answers using only the code number, verify that the code is correct by repeating back the answer in words.

For YES/NO questions, enter code 1 if the answer to the question is YES. If the answer is NO, then you must enter a dash in the box to indicate that the question was asked and the respondent answered NO. Since you are not entering a code number for NO, this is the only way to indicate that the answer was NO.

For any question, if the respondent doesn't know the answer, then record DK or "DONT KNOW" in notes next to the question. If the respondent refuses to answer, the record "REFUSED" in notes next to the question.

The office must always be able to tell the difference between questions that have been asked and the answer was NO or ZERO and questions that were asked but the respondent could not answer (DK) or did not answer (REFUSED).

Record data to the nearest whole number, unless a decimal point is printed in the box. Locate numbers correctly in relation to decimal points, and fill in every space printed after them. Use zeros as fill when answers are not given to as many decimal places as allowed for, or are given in whole numbers.

If answers appear unreasonable but really are correct, make notes in the margins or blank spaces to explain. Do not write notes or make unnecessary entries in answer boxes.

## **The Sample**

The operator or operation name, mailing address and ID number are on the questionnaire label, along with any other information the State Office has that might be helpful. In addition, the samples for the Natural Resources Conservation Service (NRCS) are identified on the label. The abbreviation "NRCS" will be printed on the line below the 9-digit ID and above the name of the operation or the operator. (Special instructions for the NRCS samples appear in Chapter 4.)

Mark on a map the location of each of the operations assigned to you before you start to interview. Show the location by a small circle with the ID number written beside it. Use this map to plan your daily travel; this will help keep travel expenses down and save time.

You may need to ask Post Office staff or Farm Service Agency employees for directions to some operations. Try to do this early in the survey so you can put the information on your map as soon as possible. Tell your supervisory enumerator (or the State Office if that is what you are told to do) about any operator whose home or office you cannot locate.

## **Interviewing**

Interview the farm operator, if possible, because information collected from other people often is less accurate. If the operator says someone else is more knowledgeable, interview that person. If the operator is not present when you visit but is expected soon, either wait or make other contacts nearby and return a little later.

If the operator is too busy to be interviewed at that time, set up an appointment at his or her convenience. Be sure to keep the appointment, and be on time! If an emergency prevents you from doing so, inform the operator beforehand and re-schedule the interview.

If the operator will not be available before the survey is over, try to interview someone who is well informed about the operation. A partner, family member or an employee may know enough about the aspects of the farm operation covered in the questionnaire to give you the information needed.

The NASS rule-of-thumb is to make up to three visits (the first visit plus two callbacks), if necessary, to get an interview. If you have an appointment or information from a neighbor on

when to try to reach the operator, you should return then. If not, make each visit at a different time of the day or evening.

Respondents often ask how long the interview will take. Never contradict the Burden Statement; however, it is okay to add to it. For example, you might say something like this: "The official nationwide average for this survey is 60 minutes, but the interviews I have done in this area averaged about X minutes." Be honest about the average time, even if your interviews are averaging longer than the time estimate in the Burden Statement.

Encourage respondents to have the farm records at hand. If records are used, accurate information will be readily available and answering will take less interviewing time.

Always read questions exactly as they are worded in the questionnaire. If the respondent didn't hear or didn't understand a question, repeat it using the same wording. You may also use any optional wording or explanations printed with the question in the questionnaire. If the respondent still doesn't understand, or asks you to explain, then use what you learned in training and information from this manual to explain what is needed.

Always ask every question and ask the questions in exactly the same order they appear in the questionnaire. Do not skip any questions unless instructions allow you to do so.

Sometimes you find out information you need later in the interview. This does not mean you can skip the question the information goes with. Instead, when you get to a question that the respondent already answered, take the opportunity to verify the information. Say something like, "I think you told me this earlier, but let me just be sure I got it right." And then ask the question exactly as worded. This doesn't make you look like you weren't listening in the first place. On the contrary, it emphasizes to the respondent the need to get things right.

Sometimes you will need to probe in order to get an adequate answer to a question. You should probe when the respondent can't answer the question, when the answer isn't exact enough to record, when you think the answer may be incorrect because it doesn't fit with information you've already obtained, and when you think the respondent didn't understand the question.

The purpose of probing is to verify unusual data or to correct misreported data. You must be careful when you phrase your probing questions that you don't influence the respondent's

answers. Probes should be “neutral,” that is, they should not suggest one answer over another. In fact, all questions should be asked in a neutral manner.

For example, don’t say things like, “Purchase and release beneficial insects in this field, you didn’t do any of that, did you?” Instead, say, “Did you purchase and release beneficial insects in this field?” And if the respondent asks for more information, explain that, “Beneficial insects are insects like green lacewings or ladybugs that are natural enemies of crop pests.”

In another example, if a respondent tells you that an expense is between two amounts, such as, “Oh, I guess the cost was between three and four dollars an acre,” you should ask, “Would you say it was closer to \$3.00 per acre or \$4.00 per acre, or what amount exactly?”

Probes should also be “non-threatening.” Be careful that you don’t appear to be questioning or challenging the respondent’s answers. Don’t say, “That can’t be right! Twelve tractors sounds like an awful lot of tractors to use just for the beef cattle!” Instead, say, “Were all twelve of these tractors used for the beef cattle production? Tractors that were used only for producing hay should be excluded. Have these been excluded?” Then make corrections to data items if necessary or make notes of the respondent’s answer if it is correct.

Be sure to make good notes. This is especially important when you find unusual situations or the respondent explains why information that seems incorrect actually is correct. Also write down any complicated calculations you have to make to come up with an answer.

These notes will help the survey statistician understand this operation when reviewing the questionnaire. Make sure the notes are clear and can be read. Never erase a note unless it is wrong! Notes can be the single most valuable editing tool available to the office statistician.

After completing each interview, be sure to review the questionnaire while the interview is still fresh in your mind. Make sure all the answers are recorded correctly and the questionnaire is complete. Check your calculations. Make sure all notes are clear.

### **Framework and Reference Period for Reporting Data**

The questionnaires for *Versions 2 and 3* PRODUCTION PRACTICES & COSTS REPORTS, and *Versions 5, 6, 7, 8, 9, and 10* PRODUCTION PRACTICES REPORTS are set up to collect information about production practices used to produce the 1996 crop of the target commodity on a randomly selected field. *Versions 2 and 3* collect several expense items associated with production of the 1996 crop. Many of these expense items should be reported in the dollar per acre cost for the

selected field. Some expenses and practices information are collected at the enterprise level on *Version 3* FLUE-CURED TOBACCO PRODUCTION PRACTICES & COSTS REPORT.

For *Version 4* COW-CALF PRODUCTION PRACTICES & COSTS REPORT, all data are collected for the beef cow-calf enterprise and all questions refer to the time period of the "last 12 months." Many questions are about production practices used to produce the calf crop, and the reference period of the "last 12 months" covers a full production cycle. There are also some questions about costs of inputs used in beef cattle production during the last 12 months. By "last 12 months," we mean the last 12 FULL months, not from a specific day exactly one year ago from the date of the interview.

### **Nonresponses**

If an interview cannot be conducted, explain why on the questionnaire. Make a note about whether the operation appears to be a farm, whether it appears any of the target commodities were grown, and any other information you think might be helpful to the State Office.

Most farmers are willing to furnish the information asked for in NASS questionnaires, but in every survey some will refuse to do so.

The key to reducing the chances of getting refusals is to be courteous and friendly, but persistent. Try to get cooperation by explaining the purpose of the survey, the need for accurate agricultural statistics, and the confidentiality of the data. Make use of materials on the survey purpose provided at your State training workshop.

Above all, do not become discouraged when you get a refusal. Continue to meet farm operators with ease, friendliness and optimism as you contact the others in the sample.

### **Supervision**

Your supervisory enumerator will set up an appointment to meet with you early in the survey. This visit will help you get off to a good start by spending some time to review a few of the interviews you have done. Hold all your completed work until this review takes place unless you are told to do otherwise.

Your supervisory enumerator or someone from the State Office will contact a few of your respondents to conduct a quality check. The quality check will verify that you spoke with the person named in the questionnaire and that the respondent understood the survey procedures.

### **Completed Questionnaires**

Turn in your completed questionnaires according to the instructions you receive. If you think that under these procedures the last few questionnaires you complete might not reach the State Office before the final due date, call your supervisor.

Keep a record of when you complete each questionnaire and when you passed it on to your supervisor or mailed it to the State Office. This will help the Office locate survey materials if they are delayed.

## FACE PAGE, SCREENING SUPPLEMENT, AND NRCS SAMPLE PROCEDURES

### FACE PAGE

#### Introduction

Before introducing yourself and this survey to an operator, create an introduction you're comfortable using. In the introduction include who you are, whom you represent and what you want. Become familiar with the information in Chapter One of this manual and be prepared to answer questions about the survey.

Some of the operators may have already heard about the ARMS on radio or television ag broadcasts or short spots. They may also have read about the survey in a pre-survey letter from the State office or in newspaper or farm magazine articles.

When making your introduction, be sure to remind the respondent that the data are strictly confidential and used to make state, regional, and national estimates. Mention that some farm financial records, particularly those for expenses (such as receipts for inputs) are extremely helpful in answering some of the survey questions on *Version 2* Corn Production Practices and Costs Report and *Version 3* Flue-Cured Tobacco Production Practices and Costs Report. In addition, for these versions, as well as for the Production Practices Reports, *Versions 5, 6, 7, 8, 9,* and *10*, records of fertilizer or pesticide applications will be useful, along with any notes or records of when field operations took place. For *Version 4* Cow-Calf Production Practices and Costs Report version, records of the breeding, calving, and weaning activities may be useful, along with their expense records for beef cow-calf production.

#### Response Codes

Upon completion of the interview, enter the response code in cell 0001 on the Face Page of the questionnaire. Response codes are:

Code 3- **COMPLETE**: The questionnaire is complete. You have obtained all of the data needed for the operation.

Code 4 - **SCREEN OUT** (or Out of Business): If the operation does not qualify as a farm or ranch, assign Response Code 4 (make notes). Also, out of business firms and institutional operations are

coded a "4". Institutional operations include prison farms, private or university research farms, not-for-profit farms operated by religious organizations, and Indian reservations.

**Code 5 - NO TARGET COMMODITY (or COMMODITIES):** In 1996 the operation was in business but did not grow any of the target commodities in your State. This code can also be used for refusals or inaccessibles when you can get enough information through other sources to be sure the operation was in business but did not grow the target commodities during 1996. Be certain none of the target commodities were grown in 1996 before using code 5 for refusals or inaccessibles.

In order to use response code 5 on *Version 10* Multi-Crop for samples drawn for 2 crops, the operation must not have grown either one of the target crops for which it was sampled. For example, if an operation was sampled for both winter wheat and potatoes but did not grow either one of these crops for harvest in 1996, then enter code 5 in cell 0001 on the Face Page. If the operation grew only one of these commodities, but not the other, then enter response code 3 when the *Version 10* questionnaire is completed for the commodity that was grown.

**Code 8 - REFUSAL:** The respondent refused to cooperate or grant an interview, **but you have identified the target name qualified as a farm operator AND grew the target commodities in 1996.**

**Code 9 - INACCESSIBLE / INCOMPLETE:** The operator was not available throughout the survey period, "inaccessible," **but you have identified the target name qualified as a farm operator AND grew the target commodities in 1996.** Also use code 9 if the respondent gave an interview but couldn't or wouldn't answer a lot of the questions (incomplete questionnaire).

### Starting Time

Record the **starting time** (military) of the interview when the respondent agrees to cooperate on the survey and you actually start the interview. We use the interview times to find out how much respondent time we're using (as a measure of respondent burden) in collecting data. We are trying to reduce interview times as much as possible and still collect the high quality data that we need. Also, by using different questionnaire versions each year, we need to estimate their interview times since we have no recent history.

### Name, Address, and Partners Verification -- LIST

All the questionnaires will have labels. If the first line (primary name line) of the label after the ID number line has an individual name (JOHN SMITH), this is the target name, (unless the Record

Status Code (RS) is 99). If the first line contains a combination of individual names (JOHN AND BILL SMITH) or an operation name (SMITH FARMS), then the name on the next line (the secondary name line) is the target name. If the RS is 99, then the operation named on the primary name line is the target. *When RS= 99, the operation name is the key.*

**Remember: The target name NEVER CHANGES. The person actually operating the farm (the farm operator) may change, but the target name is always the person identified on the label.**

The first thing you will do is verify the operation's name and address label and the names and addresses of any known partners. If there are partner labels, be sure that the partner names and addresses are correct, and that all partners are listed. Mark through the names of any partners no longer involved in the operation. If all partners aren't listed, record the names and addresses of those partners who aren't listed.

### **Name, Address, and Partners Verification -- AREA**

*Version 2: Corn Production Practices & Costs*

*Iowa, Illinois, Nebraska, & Wisconsin only*

All of the area frame tracts selected for the ARMS were part of the June Agricultural Survey.

In the ARMS we are interested in the operation the way it existed in June, so if changes have occurred in the operation since then, ignore them. Collect interview data for the operation as it existed in June. For example, if the tract was individually operated in June and changed to a partnership in September, get data for the individual operation for the time it existed (January through August). Do not collect any data for the partnership.

We know that by using this rule we'll lose some data for those few farms or ranches that were formed after June 1. They wouldn't have much impact on the overall estimates from the survey, however, because there usually aren't very many of these operations and they are relatively small.

If you find out that an error was made in June (the operating arrangement was incorrectly identified), make notes to explain the error, but complete the questionnaire for the operation **as it actually existed in June**. *If you have time between your first contact with the respondent (when you find out that the June report was wrong) and your appointment to complete the ARMS interview, call the state office and let them look up the corrected operating arrangement. If it's overlap with the list, you won't have to do an interview.*

**EXAMPLE:** The June survey questionnaire showed a partnership between Leroy and Wade Johnson. When you're verifying the name, address, and partners, you find out that Leroy and Wade have always farmed as individuals and have never farmed in partnership. In this case, you would complete two questionnaires, one for Leroy's individual operation and one for Wade's.

### Screening Report - LIST

Most list operations sampled for ARMS were screened during June, July, and August, 1996, for operation description and presence of the target commodity. The State office will insert a Screening Report inside the questionnaire with information from the screening interview.

Information on the Screening Report includes:

- ! the number of acres or the number of head of the target commodity reported on the Screening Survey.
- ! the reporting unit (individual, partnership, managed).
- ! respondent code.
- ! enumerator ID.
- ! an indicator showing if a contact was made during the Screening Survey or whether the information came from another source such as the June Agricultural Survey.
- ! the sequence (sample) number. This number also appears on the ID label. The sequence (sample) number will be used in plotting the field locations on maps (for *Versions 2, 3, 5, 6, 7, 8, 9, and 10*). (See Chapter 5, Conclusion.)
- ! the name of the crop that is designated as *Commodity 1* and the name of crop that is designated as *Commodity 2* on *Version 10*.

You should verify that the reporting unit, as listed on the Screening Report, is still correct, particularly if you made any corrections to the name, address, and partners on the Face Page.

### Screening Report - AREA

*Version 2: Corn Production Practices & Costs*  
*Iowa, Illinois, Nebraska, & Wisconsin only*

The Screening Report for the area samples will show:

- ! the reporting unit.
- ! respondent code.
- ! enumerator ID from the June Agricultural Survey.

! the sequence (sample) number.

### Screening Box on Face Page

If a question or problem exists with the operation description information picked up during the Screening Survey, the State office will want you to ask the screening questions again. This may be because the screening data were collected from sources other than the Screening Survey, the respondent to the Screening Survey may have been someone other than the operator, or incomplete information was obtained on the Screening Survey (for example, partner information was not collected).

If code 1 has been entered in the Screening Box on the Face Page, the Office will have included a Screening Supplement with the questionnaire for you to complete for this operation. If the Screening Box is not marked, then do not screen this operation, and begin the interview.

### **SCREENING SUPPLEMENT - LIST ONLY**

Farm operations in each state were sampled for the screening phase of the ARMS based on list frame information about crop acreage, livestock, and gross value of farm sales. Agri-business firms and agricultural services that do not have crops or livestock of their own should have been excluded from the sample, but it is possible some names were misclassified. Screening questions help us find out if the selected name is eligible for this survey.

Institutional farms such as prison farms, private or university research farms, not-for-profit farms operated by religious organizations, and Indian reservations are to be excluded from the study. If your assignment includes any of these farms, notify your supervisor or the survey statistician.

If an operation was in business during part of 1996 but went out of business during the year, **complete a questionnaire for the part of the year during which the operation did business.** If the operation was taken over by another operator or operation when it went out of business, make a note of this. This note should include a name, address, phone number and any other pertinent information.

Item 1      Other operation name

Even though you've already verified the label, you need to ask this item to avoid duplication and to make sure the List is up-to-date.

**Item 2        Crops, livestock or poultry**

Check YES if the operation grew any crops (field crops, fruit/nut crops, vegetables, oilseeds, specialty crops, hay) or had cattle, hogs, sheep, poultry or other livestock during 1996 on the total land operated. If YES, go to Item 5. If NO, continue with Item 3.

For an operation to qualify as growing a crop, it must have made the decisions on planting, caring for and harvesting the crop.

**INCLUDE:**        field crops, fruit and nut crops, vegetables, mushrooms, flowers, nursery stock, greenhouse crops, hay, Christmas trees, etc.

**EXCLUDE:**        home gardens and crops received in the 1996 crop year as payment for land rented to someone else.

This screening question would also be checked YES if the target name had any livestock or poultry, regardless of ownership, on the total acres operated at any time during 1996.

**INCLUDE:**

- 1)        all cattle, hogs, sheep, mules, goats, chickens, turkeys, ducks, geese, bees, rabbits, mink or other fur bearing animals, and fish that are raised commercially or for home consumption. FFA and 4-H livestock projects should also be included.
  
- 2)        operations that have five or more pleasure horses.

**EXCLUDE:**

- 1)        operations that have ONLY FOUR OR LESS pleasure horses, and any number of other animals kept only for pleasure use or as pets.
  
- 2)        horse boarding operations, riding stables, or race horse training operations that do not have other agricultural items.

- 3) **Slaughter or packing houses, auction barns, stockyards or order buyers.** These operations have livestock which are committed for slaughter. The presence of these livestock alone does not qualify an operation for the survey.

**Item 3      Sales of agricultural products or receipt  
                 of government agricultural payments**

Include sales of crops, livestock, fish and other products from the total land in the operation. Include any government payments received under the 7-year market transition program, conservation programs, etc.

This item should be answered NO when the respondent is a landlord who sold agricultural products from or received government farm payments only for land which was rented out.

If this item is checked YES, go to Item 5.

**If Items 2 and 3 are both NO, continue with Item 4.**

**Item 4      Enumerator Action (RS = 99 and Out of Business)**

Use this item only if both of the screening questions (Items 2 and 3) were answered NO. This is an item you handle yourself unless the state office has marked it for you. It's not an item you ask the respondent. If the state office hasn't marked this, you may want to circle the Record Status (RS) code on all of the questionnaires with Screening Supplements assigned to you before you go out into the field to enumerate. Check the label on the Face Page of the questionnaire. The state survey statistician will give you a label diagram to show you the location of the Record Status (RS) code on the label. If the RS is not 99 enter code 2 and skip to Item 7. If the RS is 99 enter code 1 and skip to Item 9.

**Item 5      Decision-maker for this operation**

What we're interested in is how the operation was **managed** on a day-to-day basis. We don't care what the **LEGAL** definition of the operation is.

Definitions of individual, partnership, and managed land are printed in the *Interviewer's Manual*. Landlord-tenant, cash-rent and share crop arrangements should not be considered partnerships.

When an individual operation is reported, enter code 1. When a partnership is reported, enter the number of partners. Include the person listed on the Face Page and all of the other partners. When a manager is reported, enter code 8.

#### **Item 6          Enumerator Action**

This is an item you handle yourself unless the state office has marked it for you. It's not an item you ask the respondent. If the operation is an RS 99 sample, begin the interview.

The state office may have marked RS 99 for you. If they haven't handled this, you may want to circle the Record Status (RS) code on all of the questionnaires with Screening Supplements assigned to you before you go out into the field to enumerate. Check the label on the Face Page. The state survey statistician will give you label diagrams for the location of the Record Status (RS) code on the list frame label.

#### **Item 7          Other operations**

This is a screening question to find out if the target name made day-to-day decisions for any other operations in 1996. Each additional operation must be listed or verified on the back side of the Screening Supplement. If there is more than one additional operation, additional copies of the Screening Supplement should be used. The information collected on the Screening Supplement will be used to update your State's list sampling frame.

**IF THE OPERATOR HAS OTHER OPERATIONS (Item 7 checked YES):**

If the operator had another operation, turn the Screening Supplement to its back side and complete or verify the information for the second operation. If the operator had a third operation, complete or verify the information on an additional Screening Supplement for this operation. If the operation on the Face Page is still in business (Item 4 is blank), then you'll complete the questionnaire for the operation named on the Face Page.

If the state office already knows about additional operations associated with the target name, there should be labels for Operation 2 on the Screening Supplement. There will be an additional Screening Supplement for Operation 3, if there is a third operation. Verify that the target name is still involved with each of these operations. Also, there may be partner labels for any or all of these operations. Verify the names and addresses of additional operations and of partners associated with them. Mark out any operations the target name was not associated with in 1996. If any partner names are not listed, add them.

If the target name is involved (either as individual operator or as a partner) with any other operations which aren't listed on a Screening Supplement, record these. In the partner space record the names of all of the partners other than the target name associated with each of the additional operations.

**IF THE OPERATOR DOES NOT HAVE OTHER OPERATIONS (Item 7 checked NO):**

If there weren't any other operations, and Item 4 was blank (you didn't have to complete it), begin the interview. If Item 4 was code 2 (the operation on the Face Page was out of business), go to Item 9.

#### **SPECIAL SITUATIONS**

Don't include any operation not already listed for which the target name is a hired manager.

A special situation exists if any of the operations for which there is a label on the questionnaire (Face Page, or Screening Supplement) is a managed operation. If the target name is still the hired manager, there is no problem. Handle it as you would normally. If the target name is no longer the hired manager, how you should handle it depends upon whether the label for that operation is on the Face Page or on a Screening Supplement.

If the label for the managed operation is on the Face Page, and the operation was still in business in 1996 under a new hired manager, you'll contact the new hired manager and collect data for the operation named on the Face Page. You'll contact the target name to verify the other operations listed, and if that individual has any additional operations you'll add them to the list on one or more Screening Supplement(s).

If the label for the managed operation is on the Screening Supplement, update the label for the managed operation to show the name of the new hired manager. If the operation on the Face Page is still in business, complete the interview for the operation named on the Face Page.

**Item 7a Day-to-day decisions for additional operation**

For each of the additional operations, enter the appropriate code to explain who made the day-to-day decisions in 1996. What we're interested in is how the operation was managed on a day-to-day basis. We aren't interested in the LEGAL definition of the operation.

**Item 8 Enumerator Action**

If Item 4 was blank, then you will complete the interview for the operation named on the Face Page. If you've just finished verifying other operations, be sure to tell the respondent you're interviewing for the operation named on the Face Page. Then begin the interview.

If Item 4 was code 2, enter code 4 in Response Code cell 0001 on the Face Page of the questionnaire. Then go to the Conclusion on the back page, and complete the items in the black-outlined box at the bottom of the page.

**Item 9 Out-of-business determination**

Determine if anyone else is now operating the land formerly operated by the target name on the face page. Ask this item only if the respondent answered NO to all of the screening questions. (Either the operation is out of business or there's been a major name change.) If another operation has taken over from the target name on the label, or if there was a major name change, record the name of the operator or operation now operating the land.

This item gives us the information we need to update the List Frame when operations have gone out of business. Record the name, address, and phone number (if available) of the individual or operation now operating land that used to be operated by the target name. If the respondent answers NO to this item, probe to determine what happened to the land, and make notes.

**NRCS SAMPLE PROCEDURES**

All States using the Production Practices Report questionnaires (*Versions 5, 6, 7, 8, 9, or 10* for corn, soybeans, wheat, cotton, or potatoes) will have additional samples for the Natural Resources Conservation Service (NRCS). These samples are identified on the ID label on the Face Page. On the

label, the abbreviation "NRCS" will be printed on the line below the 9-digit ID and above the name of the operation or the operator.

The NRCS samples in this survey are points of land. The field containing the selected points (and not the operator) is what we're interested in. It's possible that in some cases the name on the questionnaire won't be the correct operator of the selected point.

Names and addresses were provided to the State offices by the NRCS as a convenience to you in locating the correct operator. The NRCS attempted to get the land operator's name but in some cases they may have only gotten the land owner's name.

If a name and/or address is incorrect, just treat these samples as you would in any area frame survey where the segment is new. Find the point, and then locate the operator. Once you've found the right operator, correct the name and address on the Face Page of the questionnaire. If you have any problems locating the operator, you may find it helpful to contact the local NRCS office and talk to the person who provided this information for NASS. Each State office will be provided with information sheets containing the name and telephone number of the person in the local NRCS office who obtained the information on the operator's name and address and any supplementary information for each point.

While locating an NRCS sample point is similar to locating an area segment, there are several major differences.

### **Locating the Primary Sampling Unit (PSU) containing the sample point for NRCS samples**

Before locating the sample field, make sure to have the following materials for each NRCS sample:

- ! Questionnaire with operator's name and address. The questionnaire version you use will depend on which crop or crops are being targeted with the Production Practices Report questionnaire in your State. A list of States with NRCS samples, the target crops you will collect information on, and the questionnaire version you will use appears in the EXHIBIT 1 on page 415 at the end of this chapter.

- ! Respondent Booklets for each of the target crops in your State will be needed for each NRCS sample. For example, for each NRCS sample in Nebraska, in addition to a *Version 10* questionnaire, you will need one Respondent Booklet each for Corn, Soybeans, and Wheat.
  
- ! Only one Calendar/Target Pest Showcard will be needed for each NRCS sample. If Winter Wheat is one of two or more target crops in your State, then take a yellow Winter Wheat Calendar/Target Pest Showcard along with a white Calendar/Target Pest Showcard for all other crops. For example, for each NRCS sample in Nebraska, you will need one YELLOW Winter Wheat Calendar/Target Pest Showcard and one WHITE Calendar/Target Pest Showcard for all other crops.
  
- ! USGS or BLM topographical map or county map with PSUs marked in color.
  
- ! PSU aerial photo with sample point marked.
  
- ! Red pencil for drawing field boundary.

### **Locating the PSU in the county**

Each sample point is located within a square called the Primary Sampling Unit (PSU). The PSU is simply a square parcel of land, similar to a segment. They are typically a quarter section (160 acres) in most parts of the country. But, in some States they may be only 40 acres and in other States (especially in the West) they may be as large as a full section (640 acres).

You will first use the topographical map to find the general location of the PSU in the county. This map will show roads and geological features of the area. All of the NRCS PSUs will be identified and outlined in color. (For some counties you may receive a Department of Transportation county map instead of a topographical map.) The PSUs containing points which NASS will sample are shaded red. There may be one or several PSUs in a county. Each PSU outlined in color contains a field which you will collect information for. Make sure you have identified the correct PSU based on its identification number.

### **Locating the sample point in the field**

Once you have determined the location of the PSU, you will refer to the PSU aerial photo to find the exact location of the sample point and its surrounding field. This photo will show a closer view with

the PSU boundary marked. This will enable you to locate precisely where the point falls. Each photo will have a northerly arrow marked and a label containing the State and County name and FIPS code, the PSU identification number and the number of the selected point.

More than one point may be shown on the photo; the sample point will be circled. In some cases, you may have 2 sample points that have been selected and circled. Ignore those points not circled. If the point falls on the boundary of two fields, an arrow will indicate which field is selected.

If two selected points fall in the same field, collect information for the field on one questionnaire. On the questionnaire for the second point, write "Information for this field recorded on questionnaire ID #xxxxxxx" and write the 9-digit ID number for the first questionnaire. Return these two questionnaires together.

### **Item 1            Operator identification**

First find the point and the person whom you believe is the operator of the field containing the point. Show the operator the sample point on the photograph, and ask if he or she makes any of the day-to-day decisions involving the field containing that point. If so, ask for help in defining and drawing on the photo (in red) the boundaries of that field. If this person doesn't operate the field, ask for the name of the person who does and how to find that person. Then go find the correct person and interview that operator.

If you have to correct a name on an NRCS sample, and the corrected name is the same as one of your ARMS samples, then call the office or your supervisor for instructions.

### **Item 2            Crop or Land Usage**

Write in the name of crop that was planted for harvest in 1996. If the field was double cropped, or more than one crop was harvested, write in the name of the first crop harvested in 1996.

If the crop grown is one of the target crops in your state, ask the respondent to identify the boundaries of the field containing the sample point and draw them on the photo in red. Then go to Section D - Field Characteristics and begin the interview.

If the crop grown is not one of the target crops for your state, write in the name of the crop and go to Item 2 of the Conclusion, back page, and conclude the interview.

If no crop was grown in the field for harvest in 1996, write in the land use. Include cover crops, perennial crops, fallow or idle, or any other land use. Then go to Item 2 of the Conclusion, back page, and conclude the interview.

Make sure to make notes on the questionnaire for any unusual situations.

### **Special Situation**

It is possible that you will find the same operator with 2 fields associated with 2 different NRCS points. Determine if any of the target crops in your State were grown in the fields containing the points, and enumerate these fields. This will require completing 2 questionnaires for the same operator.

If you find target crops being grown in 3 or more fields containing NRCS points for the same operator, pick the 2 questionnaires with the target crops that have the lowest POINT NUMBERS. The POINT NUMBER is the last digit of the 9-digit ID. It is always 1, 2, or 3. For the remaining questionnaires that are not completed, enter response code 5 in cell 0001 on the Face Page.

EXHIBIT: 1  
QUESTIONNAIRE VERSION TO USE FOR NRCS SAMPLES, BY STATE

<b>STATE</b>	<b>TARGET CROP(S)</b>	<b>QUESTIONNAIRE VERSION</b>
Arkansas	Cotton, Soybeans	10
California	Cotton	8
Colorado	Winter Wheat	7
Georgia	Cotton	8
Idaho	Potatoes, Winter Wheat	10
Illinois	Corn, Soybeans	10
Indiana	Corn, Soybeans	10
Iowa	Corn, Soybeans	10
Kansas	Winter Wheat	7
Louisiana	Cotton, Soybeans	10
Maine	Potatoes	9
Michigan	Corn	5
Minnesota	Corn, Potatoes, Soybeans, Spring Wheat	10
Mississippi	Cotton, Soybeans	10
Missouri	Corn, Soybeans	10
Montana	Winter Wheat, Spring Wheat	7
Nebraska	Corn, Soybeans, Winter Wheat	10
North Dakota	Potatoes, Durum Wheat, Spring Wheat	10
Ohio	Corn, Soybeans	10
Oklahoma	Winter Wheat	7
Oregon	Winter Wheat	7
South Dakota	Corn, Winter Wheat	10
Tennessee	Cotton, Soybeans	10
Texas	Cotton, Winter Wheat	10
Washington	Potatoes, Winter Wheat	10
Wisconsin	Corn	5



## OVERVIEW OF CHAPTER 5

This section provides an overview of how Chapter 5 is organized. It also describes notations used in the chapter for guidance.

Chapter 5 contains question-by-question instructions for every item in every section of the 9 questionnaire versions being used for the Fall interview of the 1996 Agricultural Resource Management Study. Versions 2, 3, and 4 are the Production Practices and Costs Reports for corn, flue-cured tobacco, or cow-calf. Versions 5, 6, 7, 8, 9, and 10 are Production Practices Reports for the target commodities, corn, soybeans, wheat (winter, durum or other spring wheat), cotton, or potatoes.

The notation *V#s* used throughout Chapter 5 as a shorthand indication for the version number. For example, *V2* means Version 2, which is the Corn Production Practices and Costs Report; *V8* stands for Version 8, the Cotton Production Practices Report; and so forth.

Version 10, the Crop Production Practices Report, is also frequently referred to as *V10* MULTI-CROP. You will notice that this is the shorthand notation printed in the upper right-hand corner of the questionnaire under the project code. Version 10 is called MULTI-CROP because it will be used for interviews with sampled operations selected for two target crops. All the other versions enumerate only one target commodity -- corn, flue-cured tobacco, cow-calf, soybeans, winter wheat, durum wheat or (other) spring wheat, cotton, or potatoes.

*Version 10* will also be used for the NRCS point samples in states with more than one ARMS target commodity. Enumerators assigned these samples will use *V10* MULTI-CROP to record information for a only one target commodity -- whichever target crop is grown in the field where the NRCS point falls. Special instructions for enumerating NRCS point samples appear in Chapter 4.

The ARMS questionnaire sections and versions are listed in the EXHIBIT 1 on page 5004 at the end of this overview.

Sections A - M appear in one or more of the questionnaire versions being used for CROP commodities. They are set up to be a stand-alone manual for the crops versions of ARMS, *Versions 2, 3, 5, 6, 7, 8, 9, and 10*. There is no special notation for sections that appear in all of these versions. Sections that do not appear in each of these versions are marked with the version number(s). For example, Section A appears only in *V3* FLUE-CURED TOBACCO PRODUCTION PRACTICES & COSTS. When you turn to Section A in this manual, you will see the notation for *Version 3* under the section title, indicating that this is the only version that Section A appears in.

Many questions are the same on *Versions 2, 3, 5, 6, 7, 8, 9, and 10*, and their instructions are the same. If questions are the same on all these versions, there is no special notation associated with the Item number.

Some questions do not appear in every version or they are not asked for every target crop. For questions that do not appear on all of *Versions 2, 3, 5, 6, 7, 8, 9, and 10*, there are two notations to help you keep track of both the version number and the crop for which the question is to be asked:

1. The notation *V#*(in **BOLDITALICS**) appears under the question Item number in the question-by-question instructions in this manual. This notation indicates which version(s) the question is on. For example, if the notation *V2, V5, & V10* appears under Item 12 in this manual, this indicates that Item 12 is asked on *Versions 2, 5, and 10*.
2. The name of the *Crop(s)* for which the question is asked appears in *italics* beneath the *V#* indication. This is to assist you in keeping track of which questions are asked for more than one crop OR for only one crop on the *V10*. MULTI-CROP version.

For example, the following notation is for Item 9 of Section D:

**Item 9      Pest resistant seed varieties**  
**V2, V5, V6, V8, V9, & V10**  
*Corn, Soybeans, Cotton & Potatoes only*

Item 9 appears on *Version 2* CORN PRODUCTION PRACTICES & COSTS, *Version 5* CORN PRODUCTION PRACTICES, *Version 6*. SOYBEAN PRODUCTION PRACTICES, *Version 8*. COTTON PRODUCTION PRACTICES, *Version 9*. POTATO PRODUCTION PRACTICES, and *Version 10*. CROP PRODUCTION PRACTICES (Multi-crop). This question should be asked for target commodities *Corn, Soybeans, Cotton* and *Potatoes*. If you are enumerating SOYBEANS and COTTON in your state, using a *V10*. Multi-crop questionnaire, then you will ask this question for both the selected **soybean** field and the selected **cotton** field.

A variation on these notations identifies questions that appear only on *Version 2* CORN PRODUCTION PRACTICES & COSTS and/or *Version 3* FLUE-CURED TOBACCO PRODUCTION PRACTICES & COSTS. For example, the following notation is for Item 10 in Section E:

**Item 10      Total fertilizer materials cost**  
**V2 & V3 only**  
*Corn & Flue-Cured Tobacco Production Practices & Costs only*

This item appears on only the *Version 2* and *Version 3* questionnaires.

As you read the manual, you should have copies of your State's questionnaire versions to refer to. If you're working in a state not doing a particular version, ignore instructions that don't apply to you.

As you read and study this manual, you will become familiar with these notations. They will become guides, especially when you use the manual as a reference during the survey period.

Finally, Chapter 5 is organized so that you can easily remove sections for questionnaire versions not being enumerated in your state:

Sections A, B, L, and M only appear in *V3* FLUE-CURED TOBACCO PRODUCTION PRACTICES & COSTS. If *Version 3* is not being used in your state, you can remove Sections A, B, L, and M from this manual.

Section G does not appear in *Version 3*. *Version 3* is the only ARMS questionnaire version being collected in Virginia, so Virginia enumerators may remove Section G from this manual.

Section J appears only in *V2* CORN PRODUCTION PRACTICES & COSTS. If you are not doing *Version 2* in your state, you can remove Section J from this manual.

Section K appears only in *Version 2* and *Version 3*. If you are not doing either of these versions in your state, Section K can also be removed.

Sections N - V only appear in *V4* COW-CALF PRODUCTION PRACTICES & COSTS. If you are not doing *Version 4* in your state, you can remove Sections N - V from this manual.

Sections N - V are set up to be used separately from the rest of Chapter 5. They can stand alone as a separate manual of question-by-question instructions for *V4* COW-CALF PRODUCTION PRACTICES & COSTS. If *Version 4* is the only ARMS questionnaire version being enumerated in your state, you can remove Sections A - M, because you will not need to refer to them.

**If you are doing any of *Versions 5, 6, 7, 8, 9, and 10* in your state, you must keep Sections C - I in this manual.**

**EXHIBIT: 1**  
**QUESTIONNAIRE SECTIONS BY VERSION**

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**CROPS VERSIONS**

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<u>VERSION NUMBER</u>	<u>SECTION</u>	<u>SECTION TITLE</u>
3	A	Tobacco Acreage and Quota
3	B	Tobacco Greenhouses, Plant Beds and Float Beds
2, 3, 5, 6, 7, 8, 9, 10	C	Field Selection
2, 3, 5, 6, 7, 8, 9, 10	D	Field Characteristics
2, 3, 5, 6, 7, 8, 9, 10	E	Fertilizer and Nutrient Applications
2, 3, 5, 6, 7, 8, 9, 10	F	Pesticide Applications
2, 5, 6, 7, 8, 9, 10	G	Pest Management Practices
2, 3, 5, 6, 7, 8, 10	H	Field Operations, Labor and Custom Services
2, 3, 5, 6, 7, 8, 9, 10	I	Irrigation
2	J	Drying
2, 3	K	Vehicles and Tractors-enterprise
3	L	Tobacco Labor
3	M	Tobacco Harvesting Methods and Curing Barns

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**COW-CALF VERSION**

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<u>VERSION NUMBER</u>	<u>SECTION</u>	<u>SECTION TITLE</u>
4	N	Stock Flow and Inventory
4	O	Contract Placements and Removals
4	P	Purchases and Sales
4	Q	Grazed Feed
4	R	Harvested Forages and Supplemental Feed
4	S	Feed Storage and Livestock Housing Facilities
4	T	Cow-Calf Labor
4	U	Horses, Vehicles and Tractors
4	V	Machinery and Equipment

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## **SECTION A - TOBACCO ACREAGE AND QUOTA**

### **Version 3: Flue-cured Tobacco Production Practices & Costs**

#### **What's Section A for anyway? How is the information used?**

Section A gets information for calculating costs of production per planted acre. This is because, if a crop was planted, costs were incurred, regardless of whether the crop was harvested or not. Cost items are handled differently depending on whether the crop was grown on owned or rented land.

Tobacco is grown under quota arrangements. A quota is set by USDA to control the quantity of the crop that is available for sale, and ultimately, to control the price.

#### **Item 1 Total acres of flue-cured tobacco planted by operation**

If flue-cured tobacco was planted on any of the total acres operated, enter the total number of acres planted and continue. Flue-cured tobacco should be reported in tenths (1/10) of an acre.

**ONLY FLUE-CURED TOBACCO PLANTED ACRES SHOULD BE INCLUDED.**

#### **INCLUDE:**

- 1) acres planted even if they were abandoned. To be counted as abandoned acres they must have been planted to flue-cured tobacco and originally intended for harvest. These acres are included since the operator usually has had expenses associated with them.
- 2) acres planted to flue-cured tobacco and later replanted or reset to that crop. Even if for some reason the operator had to replant or reset some of the flue-cured tobacco acres (poor seed germination and weather are common causes of replanting), count these acres only one time. If acres originally planted to flue-cured tobacco had to be replanted, they should not be counted as abandoned unless the replanted or reset acres were abandoned.
- 3) Acres intended for harvest which were later plowed down and planted to some other crop for harvest.

If no flue-cured tobacco acres are reported in Item 1, review the information on the Screening Report inserted with the questionnaire. Make good notes about the reason why the current report of no flue-cured tobacco acres is different from the information reported on the Screening Report. Then go to Item 2 of the Conclusion, back page, and conclude the interview.

Even though no flue-cured tobacco acres are being reported on the Production Practices and Costs Report, this operator will be re-contacted in the spring for the financial information to be collected at that time.

There are many good, logical reasons why the Item 1 acreage may be different from the Screening acreage. The information on the Screening Report will be useful to you for determining a likely reason for any differences. For example, the respondent to the Screening Survey may have been a different person from the respondent you are interviewing for the Production Practices and Costs Report. Or the Screening acreage may have represented intentions and not crops that had already been planted. Don't assume that something is wrong. It may not be wrong, just different. You may tell the operator your notes from the Screening Survey conducted in July and August show the operation with "X" acres, and ask the operator to explain the difference. Make a note of the explanation on the questionnaire, or make corrections to Item 1 acreage, if necessary.

## **Item 2      Land tenure**

Complete Items 2a - 2d by recording the number of acres of the commodity which the operation had in each category: owned by the operation, rented for cash, share rented, or used rent-free. Flue-cured tobacco should be recorded in tenths (1/10) of an acre.

### **Item 2a      Flue-cured tobacco planted on owned acres**

Record the number of flue-cured tobacco acres planted on land the operation owned.

### **Items 2b,      Land rented 2c & 2d**

Record the total acres of the flue-cured tobacco planted on rented acres, by type of rental arrangement.

#### **INCLUDE:**

- 1) all land for which the operator paid cash rent on a per acre basis (Item 2b).
- 2) all land for which the operator paid the landlord a share of the crop (either standing or harvested). The respondent may need to add all the share rented units together to get a total share rented figure (Item 2c).
- 3) all land belonging to others (private individuals, federal, state, railroad, etc.) which the operator used rent free (Item 2d).

## **Items 3 & 4    Effective Quota**

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This series of items establishes the flue-cured tobacco effective quota for the operation. Flue-cured tobacco production is regulated by a Federal poundage quota price-support program. Growers are guaranteed a minimum price through supports in exchange for their limiting production. Flue-cured tobacco quota is allocated among individual allotment holders. Individual farms receive a farm marketing quota based on their share of the national marketing quota. This is called the flue-cured tobacco basic quota. This quota may be leased (rented) or sold under certain conditions.

The amount of tobacco a grower can market in a given year varies from the basic quota because provisions are made to carry forward under-marketings from previous years and to borrow over-marketings from the next year. These adjustments result in the effective quota.

A producer is allowed to market 103 percent of the basic quota. The operator may consider this to be the effective quota. The effective quota is only the 100 percent quota, not including the additional 3 percent. Be sure to record only the 100 percent quota.

### **Item 3      Effective quota**

Tobacco quotas can be owned or leased, and can be rented along with land in the Spring or in the Fall without land. This question asks how many pounds of quota were under each of the possible arrangements.

#### **Item 3a      Owned quota**

Record the pounds of flue-cured tobacco basic quota assigned to the operator's owned land in 1996, after adjustments were made in the basic quota for over-production in previous years. This adjustment is made because the operator "borrowed" from the 1996 quota to market the 1995 crop. Adjustments for under-production, or under-marketings carried forward from 1995, are recorded in Item 3b.

#### **Item 3b      Under-marketings carried forward from 1995**

Record the pounds of flue-cured tobacco quota that the operation carried forward from 1995 as under-marketings. This is quota carry-over because 1995 production was less than the operation's 1995 effective quota.

#### **Items 3c      Quota cash rented with land**

Record the total pounds of quota rented or transferred in for flue-cured tobacco production on cash rented land. Quota is rented with land in the Spring only. Quota cash rented with land goes in Item 3c. In Item 6, record the cost per pound and/or per acre from their rental agreements or total cash payment.

If there are multiple agreements, add all of the leased quota poundage together and enter the sum in Item 3c. It will be helpful to make good notes of the pounds leased and the rental rates for each rental arrangement.

**Items 3d      Quota cash leased without land**

Record the total pounds of quota rented or transferred in without land for flue-cured tobacco production. Under special provisions, quota may be cash rented without land in the Fall. In Item 7, record the cost per pound from the operation's rental agreements or total cash payment.

If there are multiple lease agreements, add all of the leased quota poundage together and enter the sum in Item 3d.

**Item 3e      Share rented quota**

Record the pounds of quota rented on a share rent basis and grown on the farm to which the quota was assigned.

**Item 3f      Quota leased, transferred out, or sold to others**

Record the pounds of quota leased, transferred out, or sold to some other operation without land. Include quota owned by the operator and quota transferred in to this operation, but was later leased, transferred out, or sold without land to another operation.

This can be done under special provisions with approval of the USDA Farm Service Agency (FSA). This results in a reduction in the operation's effective quota for 1996.

**Item 3g      Quota cash or share rented with land to others**

Record the pounds of quota cash or share rented to another operation with land owned by this operation. This results in a reduction in the operation's effective quota for 1996.

**Item 4      Total effective quota**

Complete the calculation of Items 3a+3b+3c+3d+3e-3f-3g. The result is the total effective quota for this operation in 1996. Verify this figure with the respondent. If necessary, go back and correct any errors in Items 3a-g.

**Item 5 Under-marketings carried forward to 1997**

Growers may be able to carry forward "under-marketings" or unused quota from 1996 to 1997 because of poor production. That is, if 1996 production is less than the operation's 1996 effective quota, this unused quota, or "under-marketings," may be carried forward for use in 1997. In this item, record the pounds of "under-marketings" carried forward.

**Item 6 Cash rents for quota rented with land**

Record the cents per pound and/or dollars and cents per acre paid for cash rental agreements, or enter the total cash payment, for quota and land rented together. If the operator had more than one rental arrangement, sum all of the cash rents paid for these arrangements and enter the total in Item 6.

Cash rental arrangements for land and quota rented together are usually priced one of two ways: (1) separate rates of so many dollars per acre of land plus so many cents per pound of flue-cured tobacco quota, or (2) a single rate per acre or total dollar amount may be charged.

In some cases, the rental arrangement for quota and land rented together may be priced only in cents per pound, with no additional rate per acre. For example, an operator may have a rental contract written for 42 cents per pound for quota rented with land. Enter 42 in the cell labeled CENTS PER POUND in Item 6, and dash the cell labeled DOLLARS & CENTS PER ACRE. Be sure to make a note for the Office.

If there are multiple agreements, add up the total rental amounts and enter TOTAL DOLLARS only. For example, if a producer has two rental agreements: One rental arrangement is for 40 cents per pound for 2200 pounds per acre of flue-cured tobacco per acre and \$55 per acre for 5 acres. For the other rental arrangement, the operator paid a total of \$2985 for a total of 6300 pounds of quota and 2.5 acres of land. The total pounds of cash leased quota is  $(2200 \times 5) + 6300 = 11000 + 6300 = 17300$ , which is entered in Item 4c. The total cash rent paid for leased quota and land in the first rental arrangement is  $(\$40 \times 11000) + (5 \times \$55) = \$4675$ . Add this to the amount paid for the second arrangement to get the TOTAL DOLLARS paid for quota and land rented together, or  $\$4675 + \$2985 = \$7660$ . Enter this figure in the cell labeled TOTAL DOLLARS in Item 6.

**Item 7 Cash rents for quota rented without land**

Record the cents per pound or total dollar amount paid for agreements to rent quota without land. If the operator had more than one rental arrangement, sum all of the cash rents paid for these arrangements and enter the total in Item 7.

## **SECTION B - TOBACCO GREENHOUSES, PLANT BEDS, AND FLOAT BEDS**

### **Version 3: Flue-Cured Tobacco Production Practices & Costs Report**

#### **What's this Section for? How is the information used?**

Tobacco is unique among major field crops in that the crop is not seeded directly into the field. Instead, seedlings are raised in special beds and then transplanted into the field. This has been the case for many years, but recently there has been major technological change in this stage of production.

Many tobacco growers now grow seedlings in special plant beds or float beds, and greenhouses are being used more and more. Growing seedlings is a very high-cost operation and the transplant process is complex. This section of the questionnaire collects detailed physical information on the use of greenhouses, plant beds, or float beds in flue-cured tobacco operations to be able to cost the transplants. This data will also be used for updating the costs between survey years using annual prices from other surveys.

In this section, you will find out where all the flue-cured tobacco plants used for this operation's 1996 crop came from. Plant sets for the flue-cured tobacco crop can be purchased from other operations and then transplanted in the field, and/or they can be grown in this operation's greenhouses, plant beds, or float beds.

If this operation grows its own plant sets, there will likely be seed cost, since plants are grown from seed in greenhouses, plant beds, or float beds. If float beds are used, the operation can also purchase float trays from other operations that are already prepared and seeded. If this was the only way plants were grown, then there may be no seed cost.

If plant beds or float beds are used, this section also collects costs for any fertilizers or pesticides used on them. Additionally for plant beds, operations performed by machines are enumerated.

#### **Item 1 Purchased flue-cured tobacco plants or sets**

Record the percentage of flue-cured tobacco plants (or plant sets) used by this operation for the 1996 flue-cured tobacco crop that were purchased from other operations. A plant set is defined as the plant that is actually transferred to the field. This plant is taken from the plant bed and transplanted to the field.

Plants grown by this operation in float trays should not be included. Only plants or plant sets which are ready to be transferred directly to the field should be included. If this operation grew all the plant sets it used for the 1996 crop and didn't purchase any from other operations, then skip to Item 2.

**Item 1a Cost of purchased flue-cured tobacco plants or sets**

Record the operation's total costs to purchase the flue-cured tobacco plants reported in Item 1. Exclude landlord's expense.

**Item 1b Landlord's expense for purchased flue-cured tobacco plants or sets**

If the operation had cash or share rented flue-cured tobacco land (Item 2b or 2c in Section A is positive), the landlord may have paid some of the cost for flue-cured tobacco plant sets. This is likely more common with share rented land, but it can happen in cash rental arrangements. Record the landlord's expense for purchasing the flue-cured tobacco plants reported in Item 1.

**ENUMERATOR INSTRUCTION:**

If ALL of the flue-cured tobacco plant sets this operation used for the 1996 crop were purchased from other operations (item 1 is 100%), go to Section C after completing Items 1a and 1b.

**Item 2 Screener for greenhouses**

This item screens for whether this operation grew flue-cured tobacco plants in its own greenhouses during 1996. These plants may have been used on the operation or they may have been sold to other operations. If greenhouses were used, complete the table. If no greenhouses were used for growing flue-cured tobacco plants in 1996, go to Item 5.

**Items 2a, 2b, & 2c Number and ages of greenhouses used for flue-cured tobacco  
Column 2**

In Column 2, record the number of greenhouses used for flue-cured tobacco in 1996, by age group. In Item 2a, enter the number of greenhouses that were less than 5 years old. In Item 2b, enter the number of greenhouses that were 5 years old but less than 10 years. In item 2c, enter the number of greenhouses that were more than 10 years old.

**Items 2a, 2b, & 2c Average size of greenhouses used  
Column 3**

For the greenhouses counted in Column 2 by age group, record their total size in square feet.

**Items 3a, 3b, 3c, 3d, 3e, 3f, & 3g**      **Cost of inputs for greenhouses**

Record this operation's costs for each of the inputs and/or supplies used in the greenhouses for the 1996 flue-cured tobacco crop. Exclude landlord expense.

In Item 3a, enter the total cost for seeds used in the greenhouses. Include the amount spent for seed held over from previous years, even though the expense was not incurred in 1996.

In Item 3b, enter the total cost for fertilizers used in the greenhouses.

In Item 3c, record the cost for all chemicals and pesticides used in the greenhouses for the 1996 flue-cured tobacco crop.

In Item 3d, enter the cost for plastic and fiber used in the greenhouses, such as those used for liners and covers.

In Item 3e, record the cost of potting soil, and in Item 3f, enter the cost of trays used in the greenhouses.

In Item 3g, record the cost of any other greenhouses supplies not already entered in Items 3a - 3f. Exclude costs for labor, fuels, lubricants, and utilities.

**Items 4 & 4a Sales from greenhouses**

In Item 4, record the percentage of flue-cured tobacco plants grown in this operation's greenhouses that were sold to other operations. If none of this operation's greenhouse plants were sold to other operations, then go to item 5.

If Item 4 is not zero, record in Item 4a the amount received by this operation from the sale to other operations of flue-cured tobacco plants grown in this operation's greenhouses in 1996.

**Item 5**              **Number of plant beds**

Report the total number of plant beds that this operation had in 1996. A plant bed is defined as an area used to grow flue-cured tobacco by planting seed in the ground. These flue-cured tobacco plants will later be transplanted to the field.

**Item 5a Total square yards of plant beds**

Record the total area in square yards of all plant beds. This is equal to the sum of the areas of the individual plant beds. The calculation for area is length times width.

Typically, plant beds measure 15 feet by 60 feet, which equals 5 yards by 20 yards. The square yards of a typical plant bed are 5 yards x 20 yards = 100 square yards. Many operators refer to the size of a plant bed as "100 yards," dropping the word "square" in their everyday language. For example, an operator may tell you that there were 5 plant beds, 100 yards each. Then the total square yards is 5 x 100 square yards = 500 square yards. Verify that the plant beds are the standard size. Enter 500 in Item 5a.

**Item 5b Percent of operation's plants from plant beds**

Record the percentage of this operation's total flue-cured tobacco plants which were grown in its own plant beds.

**Item 6 Number of float beds**

A float bed is defined as an area used to grow flue-cured tobacco plants by planting seed above ground in float trays. Float beds consist of float trays made of Styrofoam or plastic with cells for individual flue-cured tobacco plants. The float trays are placed on top of a frame, which is an area of ground framed with wood and covered with plastic to hold in water (it also controls temperature and weeds). Flue-cured tobacco grown in float beds is transplanted at a later time to the field.

Record the total number of float beds that this operation had in 1996. INCLUDE only float trays grown outside. EXCLUDE float trays in the greenhouse. These, and costs associated with them, have already been accounted for in Items 2 and 3.

**Item 6a Total square yards of float beds**

Record the total area in square yards of all float beds. This is equal to the sum of the areas of the individual float beds. The calculation for area is length times width. For example, if one float bed is size 5 yards wide by 20 yards long, and another bed is 2 yards wide by 30 yards long, the total square yards is the sum of the areas of the two beds, or  $(20 \times 5) + (30 \times 2) = 100 + 60$ , which equals 160 square yards. Enter 160 in Item 6a.

**Item 6b      Number of float tray cells**

Float trays are made of Styrofoam or plastic with cells for growing individual flue-cured tobacco plants from seed placed in these cells. The float trays are placed in float beds, where flue-cured tobacco plants are grown for transplant.

Record the total number of float tray cells in the float beds. For example, if an operator has 6 float trays with 252 cells in each tray, the total number of float tray cells is  $6 \times 252 = 1512$ . The figure 1512 is entered in Item 6b.

**Item 6c      Percent of float plants purchased**

Record the percentage of flue-cured tobacco plants grown in this operation's float beds which were purchased from other operations. Floats containing flue-cured tobacco seedlings can be purchased at any time during the development process before the plants are ready to be transplanted in the field.

If any float plants were purchased from other operations, continue with Item 6c(1). If none were purchased from other operations, go to Item 6d.

**Item 6c(1)    Cost of purchased flue-cured tobacco float plants**

Record the operation's total costs to purchase the flue-cured tobacco float plants reported in Item 6c.

**Item 6d      Percent of operation's plants from plant beds**

Record the percentage of this operation's total flue-cured tobacco plants which were grown in its own float beds.

**ENUMERATOR INSTRUCTION:**

If this operation did not use any plant beds or float beds to grow plants for the 1996 flue-cured tobacco crop (Items 5 and 6 are both zero), then go to Section C. If any plants were grown in plant beds and/or float beds, continue.

**Item 7      Seed Cost for plant and float beds**

Record this operation's total cost for seed used in the plant beds and/or float beds for the 1996 flue-cured tobacco crop. Exclude cost of seed used in greenhouses. Exclude landlord costs.

**Item 8 Custom fertilizer application cost for plant and float beds**

Record the cost of custom application of fertilizers to the plant beds and/or float beds for the 1996 flue-cured tobacco crop. Record only the application cost. DO NOT include the cost of fertilizer materials. Exclude landlord costs. Exclude costs for custom application of lime. Enter cost in total dollars for the plant and/or float beds only.

If material and application costs can't be separated, record the total in Item 9 and skip Item 8.

**Item 9 Total fertilizer materials cost for plant and float beds**

Record the TOTAL MATERIALS cost for all fertilizer, soil conditioners, micronutrients, etc., applied to the plant beds and/or float beds for the 1996 flue-cured tobacco crop. Include materials applied to the beds if they were fallow in 1995. Exclude landlord costs. Exclude the cost of lime or purchased manure. If custom applied, include the cost of materials ONLY, unless materials and application costs cannot be separated. Enter cost in total dollars for the plant and/or float beds only.

**Item 10 Pesticide custom application costs for plant and float beds**

Record the amount spent for CUSTOM APPLICATION of chemicals and pesticides on the plant beds and/or float beds for the 1996 flue-cured tobacco crop. Exclude landlord cost. Record only the application cost. Do NOT include the cost of pesticides or chemical materials. Enter cost in total dollars for the plant and/or float beds only.

If material and application costs can't be separated, record the total in item 11 and skip item 10.

**Item 11 Pesticide material costs for plant and float beds**

Record the TOTAL MATERIALS cost for all insecticides, herbicides, fungicides, surfactants, and wetting agents applied to the plant beds and/or float beds for the 1996 flue-cured tobacco crop. Exclude landlord costs. Include materials applied to the beds if they were fallow during 1995. Include materials applied to the beds before planting. If custom applied, include the cost of materials ONLY, unless materials and application costs cannot be separated. Enter cost in total dollars for the plant and/or float beds only.

**Item 12 Cost of plant and float bed supplies**

Record this operation's total cost for plant and/or float bed supplies in 1996. Include such items as plastic, canvas covers, liners, potting soil, trays, tubes, wood, fiber, etc. Exclude costs for seeds,

chemical, fertilizers, and custom applications just reported in Items 7-11. Also exclude costs for fuel and lubricants, labor, and utilities.

**Items 13, 13a & 13b      Sales of plant and float bed plants**

Item 13 screens to determine if this operation sold to other operations any flue-cured tobacco plants grown in its plant and/or float beds. If it did sell any of these plants to other operations, continue with Items 13a and 13b. If it did not sell any of these plants to other operations, go to Item 14.

In Item 13a, record the percentage of flue-cured tobacco plants grown in this operation's plant and float beds that were sold to other operations.

Record in Item 13b the amount received by this operation from the sale to other operations of flue-cured tobacco plants grown in this operation's plant and float beds in 1996.

**Items 14-18    Landlord costs for plant and/or float beds**

Ask these questions only if any flue-cured tobacco acres were CASH or SHARE rented (Item 2b or 2c of Section A is positive). In either a cash or share rent arrangement, the landlord may have paid some of the input costs. This is more common with share rented land, but it can happen in cash rental arrangements.

**Item 14      Landlord's expense for seed for plant/float beds**

Record the landlord's total costs for flue-cured tobacco seed used in the plant beds and/or float beds for the 1996 crop.

**Item 15      Total landlord custom fertilizer application cost for plant/float beds**

In Item 15, record the total landlord cost of custom fertilizer applications made on the plant beds and/or float beds for the 1996 flue-cured tobacco crop. Exclude material costs; these should be recorded in Item 16. Enter total dollars.

**Item 16      Total landlord fertilizer materials cost for plant/float beds**

Record the total landlord cost of fertilizer materials (fertilizers, soil conditioners, and micronutrients) applied to the plant beds and/or float beds for the 1996 flue-cured tobacco crop. Exclude application costs; these should be recorded in Item 15. Enter total dollars.

**Item 17 Total landlord custom pesticide application cost for plant/float beds**

In Item 17, record the total landlord cost of custom pesticide **applications** made on the plant beds and/or float beds for the 1996 flue-cured tobacco crop. Exclude material costs; these should be recorded in Item 18. Record total dollars.

**Item 18 Total landlord pesticide materials cost for plant/float beds**

Record the total landlord cost of pesticide **materials** applied to the plant beds and/or float beds for the 1996 flue-cured tobacco crop. Exclude application costs; these should be recorded in Item 17. Record total dollars.

**Items 19-21 Custom services, tractors and machine operations on plant beds**

If this operation used plant beds to grow flue-cured tobacco plants for the 1996 crop (Item 5 is positive), continue with Items 19-21. If no plant beds were used, go to Section C.

**Items 19a & 19b Cost for the custom/technical service on plant beds  
Column 2**

In Column 2 of Item 19a, record the operation's total cost for technical services such as soil testing and insect scouting performed on the plant beds for the 1996 flue-cured tobacco crop. Record the cost in total dollars paid for this service for the plant beds only. Exclude landlord costs; record these in Column 3.

In Column 2 of Item 19b, record the operation's total cost for all other custom and/or technical services performed on the plant beds for the 1996 flue-cured tobacco crop. Record the cost in total dollars paid for these services for the plant beds only. Include custom land preparation and custom planting or reseeding. Exclude custom fertilizer and pesticide applications; these were reported earlier in Items 8 and 10. Exclude landlord costs; record these in Column 3.

**Item 19a & 19b Landlord custom and technical fees  
Column 3**

In Column 3 of Item 19a, record the landlord's cost for technical services such as soil testing and insect scouting performed on the plant beds for the 1996 flue-cured tobacco crop. Record the cost in total dollars paid for this service for the plant beds only.

In Column 3 of Item 19b, record the landlord's cost for all other custom and/or technical services performed on the plant beds for the 1996 flue-cured tobacco crop. Record the cost in total dollars paid for these services for the plant beds only. Include custom land preparation and custom planting or reseeding. Exclude custom fertilizer and pesticide applications; these were reported earlier in Items 15 and 17.

## **Item 20                      Tractors Table**

Include tractors that were owned, rented, leased or borrowed by the operation and used on the plant beds only. Tractors owned in partnership should also be included if they were used on the plant beds. Don't count tractors used by custom operators. Also don't count tractors owned by the operation which were ONLY used for custom work, ONLY used for other commodities or ONLY used on other operations. Don't list the same tractor on more than one line.

If more than the available number of lines are needed, use a TRUCKS AND TRACTORS SUPPLEMENT. Copy the identification as it appears on the main questionnaire to the identification box on the supplement. The line numbering on the SUPPLEMENT picks up with line number 7 and continues through number 11.

The line number is used to identify tractors used for the plant bed activities recorded in Item 21.

### **TRACTORS                      Make and model Column 2**

List the make and model for each tractor used on the plant beds, such as John Deere 4050. Since PTO horsepower may need to be verified in the office, the make and model are important items.

List all tractors which were used on the plant beds for 1996 flue-cured tobacco plant beds, not just those actually used in 1996. In some cases this will involve recording a tractor which was not used on the plant beds at all for the flue-cured tobacco crop in 1996. This can happen because some of the work for the crop was done in the fall of 1995.

**TRACTORS**            **Model year**  
**Column 3**

List the model year for each tractor recorded in column 2, using the last two digits. For example, if the model year is 1990, enter 90.

**TRACTORS**            **Drive**  
**Column 4**

Enter the code for the type of drive for the tractor listed in column 2:

- Code 2 - 2-WHEEL DRIVE
- Code 3 - 2-WHEEL DRIVE WITH FRONT WHEEL ASSIST
- Code 4 - 4-WHEEL DRIVE
- Code 5 - CRAWLER
- Code 6 - OTHER

**TRACTORS**            **PTO HP**  
**Column 5**

Record the power take-off (PTO) horsepower rating. If the operator is not sure of the PTO rating, get his best estimate and write a note in the margin. Be sure the make and model are correctly listed so the PTO horsepower can be looked up in the State Office.

**TRACTORS**            **Fuel type**  
**Column 6**

Enter the code for the type of fuel the tractor used:

- Code 1 - DIESEL
- Code 2 - GASOLINE
- Code 3 - LP GAS (liquefied petroleum or propane)
- Code 9 - OTHER

In many states, products sold as gasoline contain ethanol. For the purposes of this survey, if the product is sold as gasoline or gasohol, record it as gasoline (code 2). If the fuel used for the tractor is ethanol or mostly ethanol, use code 9.

### **Item 21      Machine operations on plant beds**

List ALL of the work performed by machines on the plant beds for the 1996 flue-cured tobacco crop. Start by asking for the first activity to prepare the plant beds for seeding. Then continue listing the operations in the order they were performed, up to and including removing the flue-cured tobacco plant sets from the plant beds for transplanting to the fields.

Sometimes respondents forget to report an operation in its right order. When this happens, just add the forgotten operation wherever you are in the table when they remember it, and draw an arrow in the margin showing where it should have been. If the operator repeated an operation, acres may be added together as long as the tractor, and machine are the same.

When the operator reports an operation identical to one already listed (same machine and tractor), you can go back to the line where it was originally listed and add the additional acres.

If the machine and tractor are not the same as the ones already listed, the operation has to be listed separately. If possible, identical plant bed operations should be combined and entered on one line, adding square yards covered multiple times into the total square yards (Column 6) on which an operation was performed.

The machine code listings in the Respondent Booklet show most of the machines commonly used in plant bed operations. Let the respondent report the codes of the machines used. It will help you to get better data if you're using a copy of the Respondent Booklet, too.

NOTE: Include plant bed operations done by neighbors, friends, etc. on a "swap" basis. If these people use their own tractors, the tractors should be recorded in Item 20 in this section.

### **Item 21      Implements Used Column 1**

Record either the operation or the equipment the operator reports using, such as a plow, disk, or harrow. Include fertilizer and pesticide implements.

If the operator reports using a machine for which a code is not available, ask the operator which one of the implements in the Respondent Booklet best describes it, or describe the machine as completely as possible in notes.

Enter the name of each implement used on a separate line. Each line entry should indicate one complete pass over the plant beds. Record operations in the order that they were performed. Do not leave blank lines.

**Important:** If more operations were completed on the plant beds than there are lines available on the questionnaire, use a FIELD OPERATIONS SUPPLEMENT. Copy the identification as it appears on the main questionnaire to the identification box on the supplement. Continue enumerating operations on the SUPPLEMENT.

**Item 21      Implement Code**  
**Column 2**

For each operation in Column 1, record the appropriate implement code in column 2. The codes are listed in the Respondent Booklet to be used during the interview. If the implement is not listed in the Respondent Booklet, write a description of that implement in notes on the questionnaire. Probe to see if any names in the Respondent Booklet may be applicable.

For a tandem or multiple hookup of individual implements, record each implement of the set in separate lines and enter the appropriate implement code in Column 2. Maintain the order of tandem hook-ups.

If an implement is not included in the Machinery Code List in the Respondent Booklet, enter the implement name on the appropriate line in column 1, and briefly describe the implement in notes. Be as complete as possible in your description. The equipment will have to be coded in the State office based solely on the specified name and description that record. PROBE for the specific type of implement so that it can be coded correctly (for example, plow=regular chisel plow, disk=tandem disk, harrow or drag = spike tooth harrow, etc.).

**Item 21      Size of Machine**  
**Columns 3 & 4**

Enter the width of the area covered by the equipment on a single pass over the plant beds. Size means the swath covered by the machine, not necessarily how wide the equipment is. For instance, a broadcast fertilizer spreader may be only 6 feet wide, but it can spread fertilizer over a swath of 30-40 feet. In this case, 35 feet would be the right entry.

**Item 21      Unit code for machine size**  
**Column 4**

Enter the code for the unit of width associated with the swath size recorded in Column 4. The unit codes for width are:

Code 1 - FEET  
Code 2 - ROW  
Code 3 - MOLDBOARD (bottoms)

Unit codes 4 and 6 should only be used for operations hauling the flue-cured tobacco plants from the plant beds in carts or wagons pulled by a tractor.

**Item 21      Line number of tractor used**  
**Column 5**

Enter the line number of the tractor (lines 1 through 6 of Item 20) that was used to pull the equipment. If the equipment was self-propelled, enter code 99. If horses, mules or other draft animals were used to pull the equipment, enter code 66. If it was pulled by a pick-up, enter code 77. If a truck other than a pick-up was used to pull the piece of equipment, enter code 88.

For a tandem or multiple hookup of individual implements, record the first implement of the set in Column 1 and its machinery code in Column 2. Along with other data in this line, complete Column 5 identifying the Item 20 line number of the tractor used. Then record the second implement on the next line, completing Columns 1 and 2. In Column 5 on this line, enter the cell code where the Item 20 line number of the tractor pulling the equipment is recorded. This will indicate which tractor provided the power to pull the tandem implements. If more than two implements are in such a set, list them in the appropriate hookup order, each one on its own line, and enter the cell code of the tractor identified as pulling the first implement in the set.

**Item 21      Total square yards covered**  
**Column 6**

Record the total square yards covered during all the times this machine was pulled by the tractor listed in Column 5. For example, if 500 square yards were disked twice with the same disk and tractor, enter 1000 square yards in Column 6.

For land forming equipment, Column 6 should be completed by recording the **total hours** that the equipment was used in production of the target commodity. These machines are used to make or close ditches, and the entire plant beds are not covered.

## SECTION C - FIELD SELECTION

### What's this section for anyway?

The field level sample is used to supply the specific details needed for the economic analysis of the Production Practices and Costs Reports and the Production Practices Reports for field crops. In order for the field samples to be representative of all fields of the target crop of interest (corn, flue-cured tobacco, soybeans, wheat, cotton, or potatoes), each field must be randomly selected from all of the operation's fields of that crop. Simple random sampling procedures are used for field selection.

Beginning with this section, most of the questions in Sections D - J on *Version 2* Corn Production Practices and Costs (PP&C) Report and in Sections D - I on *Version 3* Flue-cured Tobacco Production Practices and Costs Report are about the field selected here in Section C. Most questions will ask for quantities, rates, and costs to be reported on a per acre basis.

On the Production Practices Versions 5, 6, 7, 8, 9, and 10, most of the questions in the entire questionnaire are about the field of the target commodity selected here in Section C. In *Version 10*, Multi-Crop, a single field of each of two target crops will be selected. Then you will proceed to enumerate information about only the selected fields of these two target crops.

On *Version 2* Corn PP&C, we begin by obtaining the total acres of corn planted on the operation with the intention of harvesting them for grain. Then we proceed to field selection.

### Item 1 Total corn acreage planted for grain

#### **V2 ONLY**

*Corn Production Practices & Costs only*

Enter the total number of acres of corn that this operation planted with the intention of harvesting the corn for grain. Acres should be recorded in tenths (1/10) of acres. For example, 180 acres of corn planted for grain should be entered as 180.0.

#### **INCLUDE:**

1) corn acres planted with the intention of harvesting the corn for grain even if they were abandoned or cut for forage or silage. The reason we include these acres is that the operator usually has had expenses associated with them.

2) acres planted to corn and later replanted to that crop. Even if for some reason the operator had to replant some of the corn acres (poor seed germination and weather are common causes of replanting), count these acres only one time. If acres originally planted to corn had to be

replanted to corn, they should not be counted as abandoned unless the replanted acres were abandoned.

3) corn acres intended for harvest of grain which were later plowed down and planted to some other crop for harvest.

**EXCLUDE:**

1) acres of corn planted for the sole purpose of being harvested as silage, forage, or fodder.

2) acres of corn planted for the sole purpose of pasturing or grazing.

3) acres of seed corn.

If the operator planted corn with the intention of harvesting some of it for some other purpose (such as silage), but at the time of planting did not know how much or which acres would be harvested for purposes other than grain, include those acres in this section. Also, include all fields containing these acres when listing fields for field selection in Item 3.

If no corn acres are reported in Item 1, review the information on the Screening Report inserted with the questionnaire. Make good notes about the reason why the current report of no corn acres is different from the information reported on the Screening Report. Then go to Item 2 of the Conclusion, back page, and conclude the interview. Even though no corn acres are being reported on the Production Practices and Costs Report, this operator will be re-contacted in the spring for the financial information to be collected at that time.

There are many good, logical reasons why the Item 1 acreage may be different from the Screening acreage. The information on the Screening Report will be useful to you for determining a likely reason for any differences. For example, the respondent to the Screening Survey may have been a different person from the respondent you are interviewing for the Production Practices and Costs Report. Or the Screening acreage may have represented intentions and not crops that had already been planted. Don't assume that something is wrong. It may not be wrong, just different. You may tell the operator your notes from the Screening Survey conducted in July and August show the operation with "X" acres, and ask the operator to explain the difference. Make a note of the explanation on the questionnaire, or make corrections to Item 1 acreage, if necessary.

**Item 2      Land tenure**

**V2 ONLY**

*Corn Production Practices & Costs only*

Complete Items 2a - 2d by recording the number of acres of corn which the operation had in each category: owned by the operation, rented for cash, share rented, or used rent-free. Acres should be recorded in tenths (1/10). The total number of corn acres must equal those recorded in Item 1.

**Item 2a      Corn planted on owned acres**

**V2 ONLY**

*Corn Production Practices & Costs only*

Record the number of acres of corn planted for grain on land the operation owned.

**Items 2b,      Land rented**

**2c & 2d**

**V2 ONLY**

*Corn Production Practices & Costs only*

Record the total acres of the corn planted on rented acres, by type of rental arrangement.

**INCLUDE:**

- 1) all land for which the operator paid cash rent on a per acre basis (Item 2b).
- 2) all land for which the operator paid the landlord a share of the crop (either standing or harvested). The respondent may need to add all the share rented units together to get a total share rented figure (Item 2c).
- 3) all land belonging to others (private individuals, federal, state, railroad, etc.) which the operator used rent free (Item 2d).

**FIELD SELECTION**

**Item 3      Number of Fields**

Item 3 asks for the number of fields of the target commodity planted on the operation for the 1996 crop. The name of the target commodity is printed on the Random Number Label placed in this section.

On *Version 2* Corn Production Practices and Costs Report, include only corn fields that were planted with the intention of being harvested for grain and exclude seed corn fields. This is different than on

*Version 5* Corn Production Practices Report and *Version 10* Crop Production Practices Report, where all fields of corn should be included, regardless of intended use.

On *Version 7* Wheat Production Practices Report and *Version 10* Crop Production Practices Report, when enumerating WINTER WHEAT, include only fields harvested for grain. For durum wheat and other spring wheat, include all fields, regardless of intended use.

On *Version 8* Cotton Production Practices Report and *Version 10* Crop Production Practices Report, include only fields of upland cotton. Exclude fields of American Pima cotton.

If the operator had only 1 field of the target commodity, enter a 1 here in Item 3 and go to item 5.

When the operator has more than 1 field of the target commodity, enter the number of fields here in Item 3 and continue with item 4.

**NOTE:** If the operator had no fields of the target commodity, conclude the interview. Go to Item 2 of the Conclusion, back page. On *Version 10*. Multi-crop, be sure to ask about fields of both target *Commodity 1* and target *Commodity 2*. If the operator had no fields of *commodity 1* and *commodity 2*, then conclude the interview by going to Item 2 of the Conclusion, back page.

#### **Item 4 Identification of Fields**

Ask the respondent to list the fields of the target commodity for the operation. If there are more than 18 fields, list only the 18 fields closest to the operator's permanent residence. Record these fields on the lines provided in the questionnaire. The fields do not have to be listed in any particular order as long as they are the (up to 18) closest fields to the operator's permanent residence. Do not skip any lines when completing this listing.

Operators can list these fields using any description that is meaningful to them. Some operations have a formal field numbering or naming system, but others may use informal names or descriptions for their fields. Many operators identify fields of crops using some combination of their location and acreage. Many refer to their fields by the name of the current or previous property owner. It does not matter what kind of field identification system is used as long as the respondent can list the fields by these names, numbers, or other description and knows which field is which.

If the operator is unable to list the fields of the target commodity by number, name, or other description, use a Field Selection Supplement grid. The grid is printed in the questionnaires for Version 2, 5, 7, 8, and 9; for Versions 3, 6, and 10, you will need to use a Field Selection Supplement.

Use the Field Selection Supplement grid to draw off (up to 18 of) the operation's fields closest to the operator's permanent residence, in order to select one from the group.

The grid can also be used if the respondent cannot adequately describe the target crop fields without drawing them. Prior experience has shown the grid to be very beneficial in these cases. However, experience has also shown grid use to be necessary only in a few cases each survey.

**When you select a field, the respondent must be able to focus on that field, and provide you with information for only that field.**

### **Item 5      Random Number Selection**

The State Office staff will have affixed a Random Number Label in the designated box on the Field Selection page in each of the questionnaire versions. Read across the FLD (field) line to match up with the number of fields you listed in item 4. On the SEL (selected) line below is the number of the randomly selected field for this operation.

Circle the pair of numbers on the label associated with the last numbered field line in item 4. Write the randomly selected field number in the cell. Circle the randomly selected field in the item 4 listing.

If there is only ONE field of the target commodity (Item 3 is 1), enter 1 in the Item 5 cell and continue.

### **Item 6      Informing Respondent of Field Selection**

Tell the respondent which field of the target commodity you have selected, and be certain that both of you can identify that field.

#### **EXAMPLE:      Random Number Selection**

The respondent tells you that there are 14 fields of corn planted for grain in the operation, and describes each field using a combination of location, landlord's name and acreage. It is evident that the respondent will be able to identify the fields from their description.

For item 3, enter "14" in cell 0050.

Continue with item 4, and list the 14 fields as the respondent identifies them.

Looking at the Random Number Label, you search along the FLD line for the number 14.

ST:99	CORN								
FLD:	1	2	3	4	5	6	7	8	9
SEL:	1	2	2	4	3	5	7	6	2
FLD:	10	11	12	13	14	15	16	17	18
SEL:	5	6	10	9	10	14	11	8	16

Circle the pair of numbers on the label associated with the number 14.

For this operation, the corn field listed on line 10 of Item 4 is selected as the random field.

Write the randomly selected field number, number 10, in cell 0051 of Item 5.

Circle field 10 in the Item 4 listing.

Identify this field for the respondent as the selected field for this interview. Be sure that the respondent knows which field this is. Tell the respondent that most of your questions will be about this selected field, and that these questions should be answered with information about this field only.

You may find that it helps the respondent to stay focused on the selected field if you refer to it occasionally during the interview using the same description that the respondent used when first listing the fields for you. For example, when you originally listed the operation's 14 fields of corn, the respondent called field #10 "45 acres on Smitty's." Several times during the interview, refer to this selected corn field using these same words. For example, when you ask Item 1 in Section E, say, "What fertilizers were applied to these 45 acres on Smitty's for the 1996 corn crop?"

You may find this procedure of referring to the field using the respondent's words to be especially helpful when completing the *Version 10* Multi-Crop questionnaire, where you will be alternating questions for selected fields of two different target commodities. This may reduce or avoid confusion for the respondent and reassure you that the respondent's answers are for the correct field.

## FIELD SELECTION on VERSION 10: MULTI-CROP

When you've completed field selection for *Commodity 1* identified on the Random Number label on page 3 in Section C of *Version 10* Multi-Crop, proceed with field selection for *Commodity 2* identified on the Random Number label on the page 4. Use the same procedures for Items 3, 4, 5, and 6. Be sure the respondent understands that you will be asking questions about **each** of these fields, and **only** these selected fields of each commodity.

Proceed with the interview, asking each question first for the selected [*commodity 1*] field, then for the [*commodity 2*] field. For some items, such as harvested acreage and yields, you will ask a short series of questions for the selected [*commodity 1*] field, and then ask a similar series for the [*commodity 2*] field. As you continue, the respondent will catch on to the procedure, and the interview will go quickly, smoothly, and efficiently.

Be sure you record the response for each question in the cell box for the appropriate commodity.

If the respondent had no fields of target *Commodity 1* AND had no fields of target *Commodity 2*, then conclude the interview. Go to Item 2 of the Conclusion, back page.

### **USING the FIELD SELECTION SUPPLEMENT GRID**

The reason we use the Field Selection Supplement grid is to be able to list the respondent's fields systematically so that a single field may be randomly selected. You will not need this procedure if the respondent has names or numbers for the fields, or is able to describe them. The exception may be when the operator has more than 18 fields, and it is difficult to identify the 18 fields closest to the operator's permanent residence. Several years experience of doing field selection on the Vegetable Chemical Use surveys and the Fruit Chemical Use surveys has show that this supplement is used very few times during the survey. Most of the time operators have little problem identifying their fields using some sort of description or using field names or numbers.

### **GRID MAPPING**

Beginning with the field of the target commodity closest to the operator's residence, draw off the operation's fields. There is no need to draw off more than 18 fields, since the Random Number Label accounts for up to 18 fields. Sketch in any boundaries such as roads and rivers which may help you and the respondent locate the fields accurately. It may be helpful to use a county map along with the grid.

Do not spend a lot of time trying to make your map a work of art. Drawing to scale is not important, but the relative location of fields to the operator's permanent residence is important. The field furthest north should be nearest the top of the grid, and the field furthest west should be at the far left of the grid. When the fields are located, you are ready to begin numbering them.

### **USING FARM/RANCH MAPS**

If the respondent has a farm or ranch map you can write on, locate and mark (an X is fine) up to 18 of the operation's fields of the target commodity. Begin numbering the fields as you mark them.

Remember, we are locating the fields closest to the operator's permanent residence. Continue marking and numbering up to a maximum of 18 fields per operation.

Some operators have copies of maps or aerial photos from their local county office of USDA's Farm Service Agency (FSA). The operator's fields are drawn off on these maps or aerial photos and identified with letters and numbers. These maps may also be helpful in the field selection process for this survey. On these FSA field maps, identify the operation's fields of the target commodity, mark them and number them beginning with number 1. Or you may use the FSA letters and numbers when listing the fields in Item 4. Be sure the operator can identify the selected field when you've completed field selection.

## NUMBERING THE FIELDS

Begin numbering the fields. If there are 18 or less fields, you can number in any sequence you want. If there are 19 or more fields, you must number the 18 fields closest to the operator's permanent residence. However, the field closest to the residence does **not** have to be "1", and the next closest "2". You only need to make sure that the closest 18 fields to the residence are listed.

See page 5036 for an example of grid mapping and numbering.

### **EXAMPLE:     Random Number Selection** *Grid only*

The respondent tells you that there are 5 fields of winter wheat on the operation, but does not have identifying names or numbers for them. The respondent is doesn't feel confident about describing them very well, but says drawing them would help.

For Item 3, enter "5".

Instead of completing Item 4, turn to the Field Selection Supplement grid in the questionnaire. You may also use a map of fields supplied by the respondent.

Complete the drawing of the 5 winter wheat fields in relation to the operator's permanent residence. Number the fields. Look at the Random Number Label, and search along the FLD line for the number five.

ST:99	WINTER WHEAT								
FLD:	1	2	3	4	5	6	7	8	9
SEL:	1	2	2	4	3	5	7	6	2
FLD:	10	11	12	13	14	15	16	17	18
SEL:	5	6	10	9	10	14	11	8	16

For this operation, the field drawn and numbered as field 3 is selected as the random field.

Write "3" in Item 5.

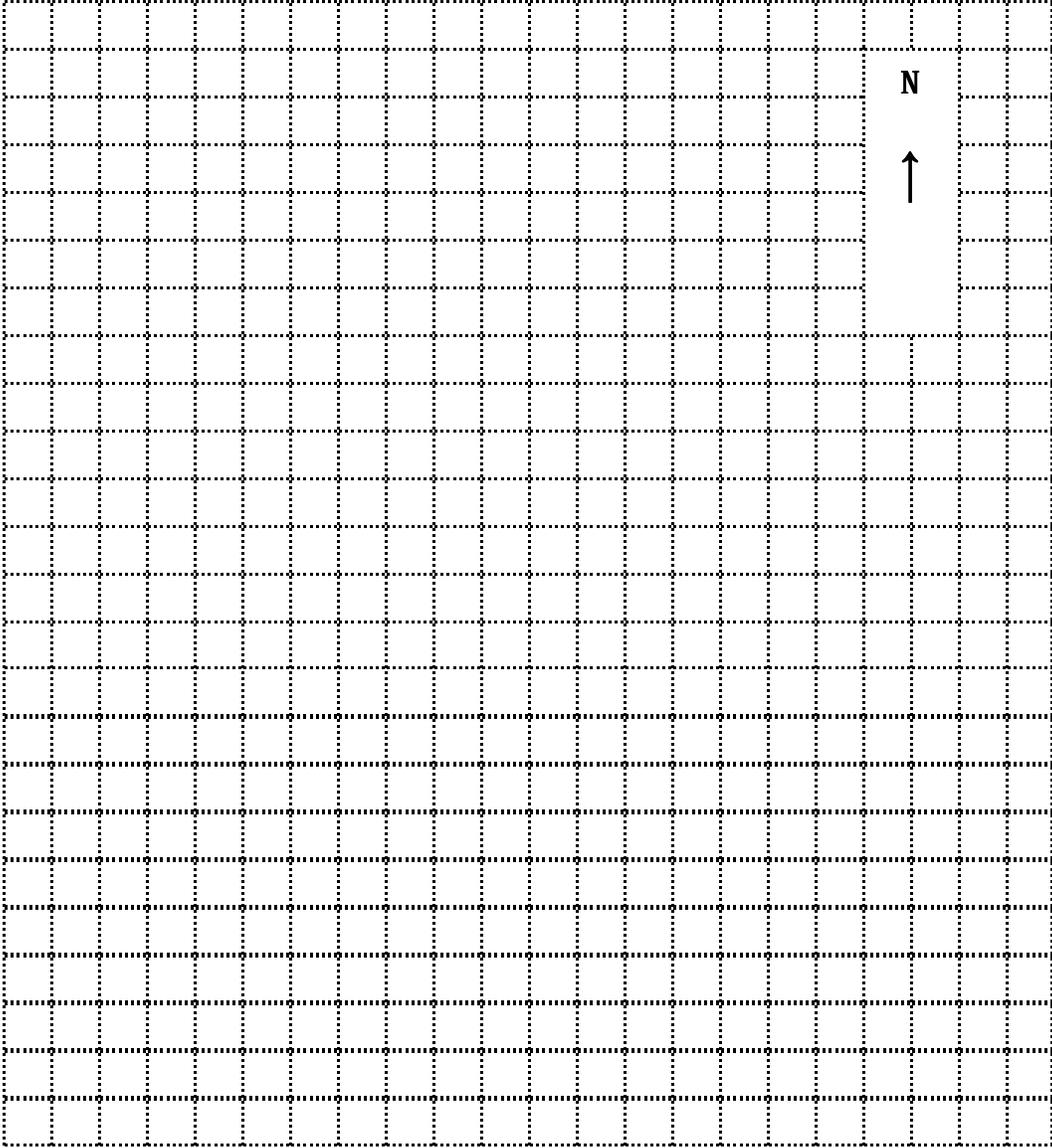
Circle this field in the drawing on the Field Selection Supplement grid.

Identify this field for the respondent as the field selected for this interview.

Continue with Section D.

There is no need to list in Item 4 the fields you have just drawn.

**EXAMPLE:  
GRID MAPPING**



## SECTION D - FIELD CHARACTERISTICS

### What's Section D for anyway? How is the information used?

Section D gets information for calculating costs of production per planted acre on the selected field. This is because, if a crop was planted, costs were incurred, regardless of whether the crop was harvested or not. Cost items are handled differently depending on whether the crop was grown on owned or rented land. If rented land was used, you must have the cost of that rent.

In some parts of the country, it is common to let land lie fallow (no crop harvested) for an entire season to conserve moisture and/or improve soil quality. In calculating cost estimates, this fallow land has a cost, and this cost is assigned to the crop that is planted and harvested following the fallow period. If the fallow acres were planted to a cover crop, that seed cost is needed. In non-survey years, knowing what the cover crop was allows ERS to adjust cover crop seed costs using NASS' annual seed prices.

For the crop, the seeding rate and costs of any purchased seed are needed to determine the cost of planting the crop. The seeding rate allows ERS to adjust seed expenses between survey years using NASS' annual seed prices.

To estimate the value of the crop, we have to know yields. Producers often ask why we ask both actual yields and expected yields. The cost and return accounts published by ERS use actual yields reported by farm operators. However, policy makers often ask about the "typical" situation. It may be that crop conditions were unusual during the survey year and the operators' responses reflected an unusual situation. With "expected" yields, ERS can see how conditions would have changed if operators had harvested what they thought they would harvest.

The previous crop data provide information on cropping patterns, which is important in analyzing fertilizer and pesticide use. In addition, USDA is required to evaluate conservation tillage systems. The previous crop is used in conjunction with the machinery data collected in Section H to estimate residue levels and determine tillage systems. The resulting information is used to evaluate soil erosion losses and water quality. Fertilizer and manure data are needed to address water quality issues. USDA is responsible for publishing estimates of the amount of fertilizer used in crop production.

### Item 1      **Field acres**

Enter the number of acres planted in the selected commodity field. Round to nearest tenth (1/10) of an acre.

On 1/2 FLUE-CURED TOBACCO, include only the acres planted to flue-cured tobacco, even though some field acres will be taken up by "slide" or "skip" rows. These are unplanted areas that allow equipment to pass. Operators must report only the acres planted to flue-cured tobacco to their local county office

of USDA's Farm Service Agency, so this is likely the figure they will provide here. However, later in Section H when field operations are enumerated, the acres covered by these slide or skip rows should be included when recording activities, such as pre-plant tillage operations, that cover all the field acres.

**Item 2      Tenure arrangement**

Determine if the selected field was owned by the operation, or if it was rented for cash or for a share of the crop produced from the selected field, or if it was used rent free. Use the following codes to indicate the tenure arrangement for the field:

- Code 1 - OWNED
- Code 2 - CASH RENTED
- Code 3 - SHARE RENTED
- Code 4 - USED RENT-FREE

This item, along with Items 2a and 2b on V2 and V3, are used to determine the cost of land for crop production. In addition, tillage practices on owned fields may differ from those used on leased fields.

**Item 2a      Cash rent paid**

**V2 & V3 only**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

If the selected field is cash rented (Item 2 is code 2), ask how much was paid in cash rent. Record cash rent in dollars and cents per acre. If this figure cannot be obtained, ask for the total dollars paid in cash rent for the field. This alternative may be needed for flue-cured tobacco fields rented with quota.

**Item 2b      Landlord's share or the crop**

**V2 & V3 only**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

If the selected field is share rented (Item 2 is code 3), record the percent of total production from the selected field that belonged to the landlord.

**Item 3      Expected yield**

**V2 & V3 only**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

Record the yield per acre the operator expects the (corn, flue-cured tobacco) crop on the selected field to yield during a normal or typical growing season. For CORN, ask for the yield expected for grain.

Most operators budget for the crop season based on an expected yield per acre for each of the crops they grow. If you have to probe to obtain the yield, it may help to ask the operator what yield he budgeted for in 1996.

The reason we ask this item is that 1996 yields may not have been normal, and data from this survey will be used as the basis for estimating production costs for several years. Asking the operator about the yield he expected should provide a good measure of "normal" yields.

**Item 4          Expected price at planting**

***V2 only***

*Corn Production Practices & Costs only*

Record the price the producer was expecting for the crop at planting time. Enter the expected price in dollars and cents per bushel (for example, 2.35).

The purpose of the question is to determine how producers make their decisions about planting and what crops to plant. When the producer decided to plant corn, costs of producing the crop were likely considered. The producer probably also had an expectation about the price that would likely be received when the crop was sold. If the budget for expenses exceeded the expected return per acre, the producer would probably not have planted corn.

Some producers intend to feed the crop to livestock and never intend to sell it. These producers still had the option of buying corn rather than growing it themselves. They probably had some expected harvest time market price in mind when the crop was planted. Ask operators what they considered at planting time might be the price they could end up paying for corn if they would have to purchase it for livestock feed.

**Item 5          Planting date**  
**V2, V5, V6, V7, V8, V9, & V10**  
*Corn, Soybeans, Wheat, Cotton, Potatoes*

Record the date on which the selected field was planted. Use the CALENDAR showcard to aid the operator in identifying the date as closely as possible. Circle the date on the CALENDAR showcard -- this will be a handy reference for later questions about dates of fertilizer and pesticide applications and field operations. (If the operator has detailed records of the dates of all field activities, the CALENDAR showcard may not be needed for this purpose.)

If the operator does not know the planting date, ask what week the field was planted. Then enter the date for the WEDNESDAY of that week, using the CALENDAR showcard.

Record month, day, and year, in digits. For example, May 8, 1996, will be entered as 50896. The year is preprinted on the questionnaire as **96** for all crops except in the cell for winter or durum wheat in *V7* and *V10*. Be sure to record the correct year for the planting date of these crops.

If the field was reseeded or replanted, record the date the field was planted the first time. If more than one day was needed for planting the field (the first time), enter the date planting was completed.

**Item 6          Soybeans drilled**  
**V6 & V10 only**  
*Soybeans only*

For the selected soybean field, determine if the soybeans were drilled. Enter code 1 for YES and go to Item 8. If soybeans were not drilled, continue to Item 7 for row width.

**Item 7          Row width**  
**V2, V5, V6, & V10**  
*Corn & Soybeans only*

Record the row width in whole inches.

**Item 8            Seeding rate**  
**V2, V5, V6, V7, V8, V9, & V10**  
*Corn, Soybeans, Wheat, Cotton, Potatoes*

Determine the initial (first) seeding rate per acre for the selected field. Do NOT include any reseeding or over seeding (full or partial) as part of this rate.

Enter the RATE of seeding and also the UNIT for the seeding rate. Rate and unit may vary by crop. Record the units to the nearest TENTH (1/10). For example, if the operator responds in bushels per acre, be sure to record the tenths of bushels. For example: 1.0 bushels per acre. Enter 1.0 in the cell labeled RATE PER ACRE. Enter code 3 for bushels in the cell labeled UNIT CODE.

**Item 9            Pest resistant seed varieties**  
**V2, V5, V6, V8, V9, & V10**  
*Corn, Soybeans, Cotton & Potatoes only*

Determine if a pest resistant seed variety was used on the selected field. Show the operator the Seed Variety Code List in the Respondent Booklet. The Code Lists printed in the Respondent Booklet identify various seed varieties by name. The operator may need this visual aid as a reminder that such a variety was planted. Determine if one of the TYPES of varieties listed was used.

Different types of resistance cannot be "stacked." That is, seed varieties currently on the market do not carry more than one type of resistance.

If more than one type of variety was used on the field, select the variety used on the most acres in the field.

The pest resistant seed varieties for CORN are:

Code 1- AN HERBICIDE RESISTANT HYBRID OR VARIETY, such as *Pioneer 3162R, Beck's 6868IRT*

Code 2- A Bt VARIETY FOR INSECT RESISTANCE, such as Nature Guard or Maximizer with Knockout

Code 3 - A GRAY LEAF SPOT RESISTANT VARIETY

The pest resistant seed varieties for SOYBEANS are:

Code 1 - AN HERBICIDE (*ROUNDUP*) RESISTANT VARIETY, such as  
Asgrow AG3001, AG3501, AG4401, AG4701, AG5601, AG6101;  
Monsanto/Harts H5088RR, H5164RR, H5566RR, H6686RR, H7550RR;  
**OR** Pioneer 9294 or 9363

The pest resistant seed varieties for COTTON are:

Code 1 - AN HERBICIDE RESISTANT VARIETY, such as BXN57, BXN58

Code 2 - A Bt VARIETY FOR INSECT RESISTANCE, such as Bollgard, Deltapine 33B or 35B

The pest resistant seed varieties for POTATOES are:

Code 2 - A Bt VARIETY FOR INSECT RESISTANCE, such as Nature Mark

Code 4 - A POTATO SCAB RESISTANT VARIETY, such as Superior

For each of these commodities, if no pest resistant seed variety was used, enter

Code 5 - NONE OF THESE

For CORN, COTTON, and POTATOES, code 2 is for a Bt variety for insect resistance. "Bt" means *Bacillus thuringensis*, which is a bacteria that is used to control many larva, caterpillar, or insect pests. Some new seed varieties contain genes from the bacteria Bt, which provides resistance to certain insect pests as the plants grow.

**Item 10      Seed treatment**  
**V6, V7, V8, V9, & V10**

*Soybeans, Wheat, Cotton, Potatoes only*

Determine if the seed used on the selected field was treated with an insecticide and/or a fungicide. The seed could have been treated by the seed company before the operator bought it or the operator may have treated the seed after purchase. Seed treatment does not include a separate pesticide applied the same time as seeding. That application should be recorded in the Pesticide Table in Item 1 of Section F.

**Item 11      Seed source**  
**V6, V7, V8, V9, & V10**

*Soybeans, Wheat, Cotton, Potatoes only*

Record the source of the seed used on the selected field. Use the following response categories:

---

Code 1- HOMEGROWN OR TRADED: "Homegrown" is seed grown on the farm by the respondent in 1995 and used for planting the selected field in 1996. "Traded" is when the operator swaps seed with no cash changing hands, such as swapping with a neighbor.

Code 2 - PURCHASED: This is seed that was bought from a seed dealer or another operator.

Code 3- BOTH: The operator used both homegrown or traded AND purchased seed to plant the selected field. If both were used on the farm and the operator cannot determine which was used on the selected field, use code 3 (BOTH).

If any of the seed used on the selected field was PURCHASED (code 2 or 3), then the cost of the portion purchased must be recorded in Item 13. If all of the seed used on the selected field was homegrown or traded (code 1), and none was purchased, then go to Item 13 for CORN or go to Item 14 for SOYBEANS, COTTON, WHEAT, or POTATOES.

#### **Item 12      Reseeding or replanting/resetting**

**V2 & V3 only**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

In *Version 2* CORN, record the total number of acres of the selected corn field that were reseeded. In *Version 3* FLUE-CURED TOBACCO, record the total number of acres of the selected flue-cured tobacco field that were replanted or reset. Enter acres to the nearest TENTH of an acre.

If some acres were reseeded more than once, count them again: number of acres reseeded times number of times reseeded. **EXAMPLE:** In a 30 acre field, if 10 acres were reseeded three times and 10 acres were reseeded once, the total would be 40.0 acres.

#### **Item 13      Seed cost**

**V2, V5, V6, V7, V8, V9, & V10**

*Corn, Soybeans, Wheat, Cotton, Potatoes*

Record the per unit cost of the purchased seed for the selected field. If both homegrown or traded seed and purchased seed were used on this field, record the cost per unit for the portion that was purchased only. Include landlord's cost.

Record the cost in dollars and cents per unit and enter the code for the appropriate unit. The unit may vary by crop. *Example:* \$11.90 per bushel. Enter 11.90 in the cell labeled DOLLARS & CENTS PER UNIT. Enter code 4 for bushels in the cell labeled UNIT CODE.

CORN may be purchased in bags that are measured by the number of kernels in the bag. When such a measure is used, the number of kernels in a seed corn bag may vary from 60,000 to over 90,000. If the measure of the bag size is in kernels, enter code 1 for APPROX. 80,000 KERNEL BAG.

On *V5* CORN and *V10* MULTI-CROP, if seed corn was grown on the selected field and the operator does not know the cost of the seed because it was provided by the contractor, be sure to make notes and record DK (Don't Know) to indicate that the operator did not know the cost.

**Item 13a Landlord seed cost**

*V2 ONLY*

*Corn Production Practices & Costs only*

If the selected field was CASH or SHARE rented, the landlord may have paid some of the cost of the seed. This is more common with share rented land, but it can happen in cash rental arrangements. Record the landlord's share of the seed cost for the selected field, either in percent or in total dollars.

**Item 14 Harvest**

*V2, V5, V6, V7, V8, V9, & V10*

*Corn, Soybeans, Wheat, Cotton, Potatoes*

Determine if harvest of the selected field has been completed at the time of the interview. If harvest has not been completed, use alternative wording in parentheses in the next few questions about what the operator expects to be the result of harvest.

**Item 15 Commodity name**

*V10 ONLY*

In the header over the lefthand set of Columns 2, 3, and 4, write in the name of target *commodity 1*. Then complete Columns 2, 3, and 4 for whichever of Items 15a-h are identified for that target commodity. Items 15i and 15j are completed for all target commodities.

In the header over the right-hand set of Columns 2, 3, and 4, write in the name of target *commodity 2*. Then complete Columns 2, 3, and 4 for whichever of Items 15a-h are identified for that target commodity. Items 15i and 15j are completed for all target commodities.

If you accidentally reverse the order of the commodities, for example, because the respondent answers for the target commodity 2 field first, simply record in the appropriate header the name of the commodity for which Items 15a-j are answered. The Office will code the Office Use boxes accordingly and the computer will get it straight. You don't need to transfer data just because the order of commodity 1 and 2 were accidentally reversed.

The target commodities are:

CORN  
SOYBEANS  
COTTON  
WINTER WHEAT  
DURUM WHEAT  
(OTHER) SPRING WHEAT  
POTATOES

If more than one type of wheat are target crops in your state, be sure to identify the type of wheat when writing in the name of target *commodity 1* or *2*.

**Item 15a-j Harvest purpose**

**Column 1**

*V2, V5, V6, V7, V8, V9, & V10*

*Corn, Soybeans, Wheat, Cotton, Potatoes*

Determine how many acres in the selected field were harvested for each purpose identified in Items 15a-j, depending on the commodity. If harvest of the field has not been completed at the time of the interview, use the alternative wording in parentheses and ask how many acres **will be** harvested for each purpose listed. Record acres in each use to the nearest TENTH of an acre.

For CORN, ask the number of acres harvested (or to be harvested) for:

Item 15a - GRAIN  
Item 15b - SILAGE (green chop)  
Item 15c - SEED for planting (*V5 & V10 only; not in V2*)  
Item 15i - ABANDONED  
Item 15j - OTHER USE

For SOYBEANS, ask the number of acres harvested (or to be harvested) for:

Item 15a - GRAIN (or beans for oil or meal)  
Item 15i - ABANDONED  
Item 15j - OTHER USE

For WHEAT, ask the number of acres harvested (or to be harvested) for:

Item 15a - GRAIN  
Item 15b - SILAGE (green chop)  
Item 15c - SEED for planting

Item 15i - ABANDONED

Item 15j - OTHER USE

For COTTON, ask the number of acres harvested (or to be harvested) for:

Item 15d - COTTON LINT

Item 15e - COTTON SEED FOR PLANTING (and lint)

Item 15i - ABANDONED

Item 15j - OTHER USE

For POTATOES, ask the number of acres harvested (or to be harvested) for:

Item 15f - PROCESSING POTATOES

Item 15g - TABLE STOCK POTATOES

Item 15h - SEED FOR PLANTING

Item 15i - ABANDONED

Item 15j - OTHER USE

### **Item 15a -h Yield per acre**

#### **Columns 3 & 4**

*V2, V5, V6, V7, V8, V9, & V10*

*Corn, Soybeans, Wheat, Cotton, Potatoes*

If the selected field has been harvested, record average yield per acre for each use identified in Column 2. If harvest of the selected field is not complete, use the alternative wording in parentheses and ask the operator what yield per acre is expected at harvest. In Column 3, record the appropriate unit for the commodity.

### **Item 16 Flue-cured tobacco harvested acres**

#### **V3 ONLY**

*Flue-Cured Tobacco Production Practices & Costs only*

Determine the number of acres in the selected field that were actually harvested.

### **Item 16a Flue-cured tobacco yield**

#### **V3 ONLY**

*Flue-Cured Tobacco Production Practices & Costs only*

Record the actual yield per acre (in pounds) obtained at harvest of the selected field.

**Item 17      Commodity name**  
**V10 ONLY**

In the header over the **left-hand** set of Columns 2 and 3, write in the name of target *commodity 1*. Then complete these columns of Items 17a-e for that target commodity.

In the header over the **right-hand** set of Columns 2 and 3, write in the name of target *commodity 2*. Then complete these columns of Items 17a-e for that target commodity.

If you accidentally reverse the order of the commodities, for example, because the respondent answers for the target commodity 2 field first, simply record in the appropriate header the name of the commodity for which Items 17a-e are answered. The Office will code the Office Use boxes accordingly and the computer will get it straight. You don't need to transfer data just because the order of commodity 1 and 2 were accidentally reversed.

The target commodities are:

CORN  
SOYBEANS  
COTTON  
WINTER WHEAT  
DURUM WHEAT  
(OTHER) SPRING WHEAT  
POTATOES

If more than one type of wheat are target crops in your state, be sure to identify the type of wheat when writing in the name of target *commodity 1* or *2*.

**Item 17      Previous crops**  
**V3: Flue-Cured Tobacco Production Practices & Costs**  
**Column 2**  
**V2, V5, V6, V7, V8, V9, & V10**  
*Corn, Soybeans, Wheat, Cotton, Potatoes*

In the series of Items 17a-e, you will ask the operator to identify the crops that were previously planted on the selected field during the time periods working backwards to 1994 for FLUE-CURED TOBACCO or 1993 for ALL OTHER CROPS.

Include cover crops.

The **action** of planting the crop must have occurred during the time period named in each individual item. If a perennial crop is growing on the field during a particular time period, but it was not planted during that period, then code 318 (for fallow, idle/diverted) should be entered in the appropriate cell. Perennial crops, such as alfalfa, clover, or other grasses, should only be captured in the time period during which they were actually planted. The one exception to this rule is Item 17e (SPRING/SUMMER of 1993). If a perennial crop was growing on the field at that time, it should be recorded, even if it was not planted at that time.

Completing this question has presented some difficulties, especially when double-cropping occurred. To address these problems we have defined the planting periods as Spring/Summer and Fall.

The reason for including summer in the spring planting period is that in some States when double cropping occurs, the second crop may not be planted until late June or early July. Thus, the spring/summer period really extends up to the fall planting period. The fall period would be for planting winter crops, such as winter wheat or cover crops.

Enter the crop code for the crop previously planted on the selected field for **each** of the designated time periods. Use the Partial Crop Code List printed in the questionnaire. For any crops not listed in the Partial Crop Code List, write the crop name beside the cell and leave the cell blank. The survey statistician in the Office will fill in the correct crop code for that crop. If the operator did not have the field in any of the previous time periods and doesn't know what crops were planted, make a note explaining that.

If a crop planted on the selected field in a previous time period, was abandoned before harvest because of drought, hail, or some other event, record the code for that crop.

If the current field was subdivided into two or more fields in a previous period, record the crop that occupied the largest portion of the current field. For example, if the current field is 100 acres and last year 60 acres were fallow and 40 acres were wheat, record fallow (Code = 318) as the previous crop.

**Important:** All cells must have an entry. **A dash (-) is unacceptable.** (The only exception is Item 17a should be left blank on *Version 7* and *Version 10* when WINTER WHEAT is the target commodity.) This should get each past crop entered in the time period in which it was planted. For Items 17a, 17b, 17c, and 17d, if no crop was **planted** during the specific time period, enter code = 318 (fallow, idle, or diverted). This includes perennial crops growing, but not planted, during that period. However, for Item 17e, if a perennial crop (alfalfa, etc.) was growing in that period, although it was actually planted earlier, enter the code for that perennial.

**Item 17a Previous crop planted in FALL 1995**

Record the code for the crop **planted** on the selected field in the fall of 1995. If a crop was planted, it would likely be a cover crop or a winter crop. Use code 318 if **no** crop was planted during that period or if the selected field was fallow, idle, or diverted.

On *Version 7*: WHEAT and *Version 10*: MULTI-CROP, skip Item 17a when WINTER WHEAT is the target commodity for the selected field.

**Item 17a(1) Cost of cover crop seed  
V3 ONLY**

*Flue-Cured Tobacco Production Practices & Costs only*

Record the total cost for seed used to plant the cover crop on the selected field in the Fall of 1995. Include the landlord's expense for cover crop seed.

**Item 17b Previous crop planted in SPRING/SUMMER 1995**

Record the code for the crop planted on the selected field in the spring/summer of 1995 (for example, spring wheat = 164). Use code 318 if no crop was planted during that period or if the selected field was fallow, idle, or diverted.

**Item 17c Previous crop planted in FALL 1994**

Record the code for the crop planted on the selected field in the fall of 1994. If a crop was planted, it would likely be a cover crop or a winter crop. Use code 318 if no crop was planted during that period or if the selected field was fallow, idle, or diverted.

**Item 17d Previous crop planted in SPRING/SUMMER 1994**

Record the code for the crop planted on the selected field in the spring/summer of 1994 (for example, corn for grain = 6). Use code 318 if no crop was planted during that period or if the selected field was fallow, idle, or diverted.

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**Item 17e Previous crop planted in SPRING/SUMMER 1993**  
**V2, V5, V6, V7, V8, V9, & V10**  
*Corn, Soybeans, Wheat, Cotton, Potatoes*

Record the code for the crop planted on the selected field in the spring/summer of 1993 (for example, corn for grain = 6). Use code 318 if no crop was planted during that period or if the selected field was fallow, idle, or diverted. If a perennial crop, such as alfalfa, clover, or other grasses, was growing on the selected field in this time period, enter the code for the perennial crop, even if it was not planted during this period.

**EXAMPLES**

We know that the target commodity was planted in the spring/summer of 1996. The only exception is when the target commodity is WINTER WHEAT, which would have been planted in FALL of 1995 (and Item 17a is left blank).

Now we need to record the crops PLANTED in the previous time periods.

**Example 1: Continuous soybeans.**

Item 17a: Code = 318 Nothing planted in fall of 1995.  
Item 17b: Code = 26 Soybeans planted in the spring/summer of 1995.  
Item 17c: Code = 318 Nothing planted in fall of 1994.  
Item 17d: Code = 26 Soybeans planted in the spring/summer of 1994.  
Item 17e: Code = 26 Soybeans planted in the spring/summer of 1993.

Items 17a and 17c receive code 318, even though this is only a normal time period between continuous crops. No crop was PLANTED on the selected field during these fall periods.

**Example 2: Continuous double crop soybeans with winter wheat.**  
**Target commodity: WINTER WHEAT**

Item 17a: BLANK Target commodity for selected field is WINTER WHEAT, which was planted in fall of 1995.  
Item 17b: Code = 26 Soybeans planted in the spring/summer of 1995.  
Item 17c: Code = 165 Winter wheat in fall of 1994.  
Item 17d: Code = 26 Soybeans planted in the spring/summer of 1994.  
Item 17e: Code = 26 Soybeans planted in the spring/summer of 1993.

**Example 3: Continuous double crop soybeans with winter wheat.**  
**Target commodity: SOYBEANS**

- Item 17a: Code = 165 Winter wheat in fall of 1995.  
Item 17b: Code = 26 Soybeans planted in the spring/summer of 1995.  
Item 17c: Code = 165 Winter wheat in fall of 1994.  
Item 17d: Code = 26 Soybeans planted in the spring/summer of 1994.  
Item 17e: Code = 26 Soybeans planted in the spring/summer of 1993.

**Example 4: Perennial crop seeded in earlier period**

- Item 17a: Code = 318 Nothing planted in fall of 1995. Perennial crop growing.  
Item 17b: Code = 318 Nothing planted in spring/summer of 1994. Perennial crop growing.  
Item 17c: Code = 318 Nothing planted in fall of 1994. Perennial crop growing.  
Item 17d: Code = 1 Alfalfa planted in the spring/summer of 1994.  
Item 17e: Code = 6 Corn planted in the spring/summer of 1993.

**Item 17 Irrigation of previous crops**

**Column 3**

**V2, V5, V6, V7, V8, V9, & V10**

*Corn, Soybeans, Wheat, Cotton, Potatoes*

For each previous crop identified in Column 2 of Items 17a-e, determine if that crop was irrigated during the designated time period. Enter code 1 for YES in Column 3 if the Column 2 crop was irrigated.

**Item 18 Crop residue removal**

**V2, V5, V6, V7, V8, V9, & V10**

*Corn, Soybeans, Wheat, Cotton, Potatoes*

Check to see if the most recent crop was a small grain. The most recent crop would be the first item in Item 17 that is not code 318 for FALLOW/IDLE/DIVERTED. This would be Item 17a for a cover crop when winter wheat is not the target crop, or Item 17b for target crop winter wheat **or** if no crop was planted in Item 17a, or Item 17c if winter wheat was target crop **and** no crop was planted in 17b. Small grains include barley, oats, wheat, rye, canola, etc. If NO small grain preceded the target commodity, then skip item 18.

If the most recent crop was small grain, then determine if the crop residue (normally after harvest) was removed from the field. Methods of removal could include baling, burning, and removing loose straw. Code 1 for YES if residue was removed.

**Item 19 No-till**

**V2, V5, V6, V7, V8, & V10**

*Corn, Soybeans, Wheat, Cotton only*

Ask if a no-till system was used to prepare and plant the selected field. If YES, enter code 1 and ask Item 19a. If NO, go to Item 20.

In a no-till system, no tillage type implements (those that disturb the soil surface) cross the field before the planter. This would exclude implements such as shredders and rock pickers that do not disturb the soil.

**Item 19a    Years no-till**  
**V2, V5, V6, V7, V8, & V10**

*Corn, Soybeans, Wheat, Cotton only*

If no-till was used (Item 19 is code =1), then determine the number of **consecutive** years that no-till has been used on the selected field. The key word is consecutive. This is regardless of previous crop type.

For example, the target commodity is soybeans and a corn/soybean rotation is used over the years. If the operator no-tills only soybeans each time, this would only be **one** consecutive year for the target crop of soybeans. The number "1" would be entered in Item 19a.

**Item 20a-f    Land-use practices**  
**V2, V5, V6, V7, V8, V9, & V10**

*Corn, Soybeans, Wheat, Cotton, Potatoes*

Determine whether each of the land use practices in Items 20a-f was used on the selected field for the target commodity. Include land not planted to the target commodity if the operator considers it to be part of the selected field. For example, corn may be strip cropped with alfalfa in the same field. Only the acres planted to corn were counted in Item 1. However, since the entire field features strip cropping, the answer to Item 20d described below would be code 1= YES.

Each of the individual items 20a, 20b, 20c, 20d, 20e, and 20f must be asked. This is not a multiple choice question -- that is, there may not be just one single answer. The operator may use more than one of the land use practices listed. Enter code 1= YES for each practice the operator used.

In Item 20a, determine if the operator uses grassed waterways in the selected field. Grassed waterways are water drainage channels in a field. Often they have been shaped or graded, and a permanent cover of vegetation has been established. Include channels that are used as outlets for terraces and for disposing of runoff from diversion channels, stabilization structures, contoured rows, and natural depressions.

In Item 20b, determine if the operator uses terraces in the selected field. Terraces are raised level areas of a field supported on one or more sides by a wall or bank of turf.

In Item 20c, determine if the operator uses contour farming in the selected field. Contour farming is when producers perform tillage operations and plant crop rows across the slope of the land. Furrows, crop rows, and wheel tracks across the slope help retain water so that it can seep into the soil, instead of running off, taking loose topsoil with it.

In Item 20d, determine if the operator uses strip cropping in the selected field. Strip cropping is when strips of row crops and other cultivated crops alternate with grasses or other close growing crops. These alternating strips are planted across the slope of the land. Water runoff from the row crop is slowed down by the grasses, allowing it to seep into the soil better.

In Item 20e, determine if the operator uses underground outlets such as tile drainage in the selected field. Underground outlets such as tile drainage control water runoff by carrying water through underground pipe to areas where it can run away without disturbing the soil.

In Item 20f, determine if the operator uses other drainage channels or diversions in the selected field. Other drainage channels or diversions include any other types of structures used to control or dispose of surface water runoff. Their purpose is to prevent or reduce soil erosion.

**Item 21      NCRS classification of Highly Erodible land**  
**V2, V5, V6, V7, V8, V9, & V10**  
*Corn, Soybeans, Wheat, Cotton, Potatoes*

Determine if the Natural Resources Conservation Service or NRCS (*formerly called the Soil Conservation Service or SCS*) has notified the operator that the selected field has been classified as "Highly Erodible" or HEL land. If YES, enter code 1.

NRCS (formerly SCS) would have evaluated the selected field and notified the operator of its classification if the operator had requested any kind of federal program benefits for the selected field.

Whether a field is classified as Highly Erodible depends on rainfall, the potential for soil erosion, and the length and slope of the field. NRCS uses these characteristics and other information to classify fields as Highly Erodible or not.

**Item 22      Wetland**  
**V2, V5, V6, V7, V8, V9, & V10**  
*Corn, Soybeans, Wheat, Cotton, Potatoes*

Determine if the NRCS (formerly SCS) has notified the operator that the selected field contains a wetland. If YES, enter code 1.

Wetlands are areas where the normal condition of the soil is to be wet enough for long enough to support the continued growth of the kinds of plants that prefer wet soil conditions.

**Item 23      Crop insurance**  
**V2, V5, V6, V7, V8, V9, & V10**  
*Corn, Soybeans, Wheat, Cotton, Potatoes*

Determine if the selected field is covered by any Federal, state, or private crop insurance for the 1996 crop. If YES, enter code 1. Include multi-purpose crop insurance or insurance specific to hail or wind.

**NOTES**

## SECTION E - FERTILIZER AND NUTRIENT APPLICATIONS

### What's this Section for? How is the information used?

USDA is responsible for publishing estimates of the amount of fertilizer used in crop production. Accurate data on fertilizer application rates are also needed for conducting sound economic analyses to address many complex issues concerning water quality and food safety. These analyses enable policy makers to make informed decisions.

Specifically, the data collected will be used to analyze issues and policies in the following general areas:

1. **Water Quality:** fertilizer data enable a determination of the geographic extent and intensity of use.
2. **Food Safety:** data are needed to determine the extent and intensity of fertilizer use to aid in the development of residue monitoring programs.

Nutrient management practices can help farmers adjust fertilizer application to crop needs and reduce losses to the environment. Legume production, storage and use of livestock and poultry manure, soil, plant, and tissue testing are all methods for computing nutrient balances that establish the basis of sound nutrient management.

In addition, ERS uses the questions on costs to estimate the fertilizer expense for the year of the survey. For non-survey years, the actual materials and application rates are used with data from other surveys to create a cost index that is then applied to the actual expense from the survey year.

The general purpose of the section is to identify what fertilizers are actually used to produce the 1996 crop on the selected commodity field. Include the cost of all fertilizers applied to the selected commodity field during 1995 and/or 1996 for the 1996 crop, even if the materials were purchased before 1996.

### USE OF SUPPLEMENTS

If more lines are needed than the number available in the table, use a FERTILIZER SUPPLEMENT. Copy the identification as it appears on the main questionnaire to the identification box on the supplement. Assign the next Table number, 002, 003, 004, etc., to each additional supplement used. You begin numbering the supplements with Table 002 because Table 001 already appears in the questionnaire. Use as many supplements as you need.

**Item 1 Fertilizer table**

Determine if chemical fertilizers (nitrogen, phosphate, and/or potash) were applied to the selected field. Respondents must include all chemical fertilizer materials applied specifically for the 1996 crop. This includes fertilizer applied in the fall of 1995. If the selected field was fallow during the summer of 1995, include fertilizers applied during that period. Include custom applied fertilizers. Exclude micro-nutrients, such as iron, zinc, and boron.

If any fertilizers were applied, complete the Fertilizer Table. If no fertilizers were applied, go to Section G.

On *Version 10*, Multi-crop, enter code 1 for YES in the correct cell for the selected commodity fields. Complete the Pesticide Table for each commodity field that fertilizers were applied to. If no fertilizers were applied to the selected commodity field, dash the cell. If no fertilizers were applied to either of the selected fields, then go to item 3.

**FERTILIZER TABLE Commodity Code**

**Column 1**

***V10 only***

*Corn, Soybeans, Wheat, Cotton, Potatoes*

Enter the commodity code for each selected field as you enumerate the fertilizer applications for that target commodity.

The commodity codes are:

- Code 1 - CORN
- Code 2 - SOYBEANS
- Code 3 - COTTON
- Code 4 - WINTER WHEAT
- Code 5 - DURUM WHEAT
- Code 6 - (OTHER) SPRING WHEAT
- Code 7 - POTATOES

When the fertilizer applications are completely enumerated for the selected *[commodity 1]* field, proceed to list the fertilizer applications for the selected *[commodity 2]* field.

If the respondent remembers an additional fertilizer application to the selected *[commodity 1]* field after you begin listing the applications for the *[commodity 2]* field, just record it wherever you're at in the table. Be sure to enter the correct commodity code in Column 1.

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**FERTILIZER TABLE      Materials used**  
**Column 2**

Record the plant nutrients of each fertilizer material, nitrogen (N), phosphate ( $P_2O_5$ ), and potash ( $K_2O$ ), applied to the selected field for the target commodity. Use of these nutrients can be reported in either of two ways:

1.     **Percent analysis:** This is the percentage composition of the product expressed in terms that the law requires and permits.
2.     **Pounds of actual plant nutrients.**

Record the fertilizer data in terms of pounds, gallons, or pounds of actual plant nutrients applied PER ACRE. Percent analysis is the preferred method of obtaining the data, because products used can be more easily identified this way. Use actual plant nutrients only if absolutely necessary.

Be careful that the respondent does not give you the total amount of fertilizer applied to the entire field. If a respondent knows only the total pounds of fertilizer or plant nutrients applied to the field and not the rate per acre, you must calculate rate per acre and enter it in the table. In the margin of the form, show the computations for deriving the rate per acre.

For some crops, farmers may say that fertilizer applied to the most recent previous crop grown on the field was partly for the benefit of the target crop. Only part of this fertilizer was actually carry-over for the target crop. Watch out for this because we **DO NOT** want to include these fertilizer applications.

**Important:** Record each individual fertilizer application made to the selected field on a separate line. When fertilizer materials are bulk blended for application (for example, 10-10-10 combined with 18-46-0), each product is recorded on a separate line in the fertilizer table, even though this fertilizer blend was applied in one trip over the field.

### Percent Analysis

The most common method for reporting fertilizer materials is by percent analysis of their content of Nitrogen (N), Phosphate ( $P_2O_5$ ) and Potash ( $K_2O$ ), in that order. For example, 13-13-13 is 13 percent Nitrogen, 13 percent Phosphate and 13 percent Potash. This means that thirty-nine (13+13+13) out of every one hundred pounds of this fertilizer is active ingredients (N, P and K). Sixty-one (100 - 39) pounds of every one hundred pounds of this fertilizer is carrier material (inert ingredients).

Two of the more common fertilizers used in crop production are 18-46-0 (diammonium phosphate or DAP) and 82-0-0 (anhydrous ammonia). If 18-46-0 were reported, you'd record 18 in column 2 under N

(nitrogen) and 46 under P<sub>2</sub>O<sub>5</sub> (phosphate). The K<sub>2</sub>O (potash) column would be dashed since there is no potassium (potash) in the mixture. For anhydrous ammonia, you'd record 82 under N. Since there is no phosphorus or potash in anhydrous, the phosphate and potash columns should be dashed.

Some fertilizer materials can also be applied in liquid form. A common liquid fertilizer material used in crop production is 32-0-0 (nitrogen solution). For this material you would record a 32 under N for nitrogen.

**No fertilizer reported by analysis will have an N-P-K total of more than 85.** Carrier or filler material makes up the rest of the total weight for commercial fertilizers. If a farmer reports 35-45-20, he's probably reporting pounds of actual nutrients instead of analysis since the three percentages add up to more than 85 percent.

For each fertilizer application to the selected field reported by percent analysis, record the quantity applied per acre (including carrier) in column 3 and the appropriate unit of measure, pounds (code 1) or gallons (code 12), in column 4.

For bulk blended fertilizer materials, use a separate line for each of the fertilizers that the dealer blended in the mixture. If the dealer mixed 150 pounds of 18-46-0 and 250 pounds of 0-0-60 together, record each on a separate line. DO NOT just add it up and record it on one line as 400 pounds of 18-46-60. This would be a major error, because the correct analysis of this fertilizer is 7-17-38, calculated by:

$$N \quad 150/400 \text{ times } .18 \quad = .068 \quad (\text{or } 7\%)$$

because there were 150 pounds of 18-46-0 in the mixture and of those 150 pounds, 18% was Nitrogen.

$$P \quad 150/400 \text{ times } .46 \quad = .173 \quad (\text{or } 17\%)$$

because 46 percent of the 150 pounds was available Phosphorus.

$$K \quad 250/400 \text{ times } .60 \quad = .375 \quad (\text{or } 38\%)$$

because 250 pounds of the total 400 were 0-0-60 and this material is 60 percent Potash.

### Actual Plant Nutrients

Another way farmers commonly report fertilizer use is in terms of Actual Plant Nutrients (APN) applied per acre. (This may also be called pounds of active ingredients.) If the farmer knew he applied 60 pounds of nitrogen; 35 pounds of phosphorus; and 40 pounds of potash PER ACRE, record this information in column 2 and record code 19 in column 4. In this case, no entry is needed in column 3 because we know the actual amount applied for each of the three materials so we don't need to calculate it from percentages.

When farmers report "units" of N, P or K, this is usually a clue that they are reporting pounds of actual nutrients. A unit of Nitrogen will amount to more than a pound of actual material applied, because part of it is carrier material, just like when the farmer reports by percent analysis. For example, if the farmer reported that he applied 100 units of Nitrogen in the form of anhydrous ammonia, he would have applied about 122 pounds of 82% nitrogen. ( $122 \times .82 = 100$ ) If this were reported by percent analysis, 82 would be recorded in the N column, 122 in column 3 and 1 in column 4. If it were reported as pounds of actual nutrients it would be recorded as 100 in the N column and 19 in column 4. Column 3 would be left blank.

When actual plant nutrients (active ingredients) or "units" of a fertilizer are reported, you should probe to be sure how much was actually applied. One way to do this is to ask (when units were reported) if the actual weight of material applied was more than the number of units reported. For example, "You said you put down 100 units of UAN32 per acre. Did the material you applied actually weigh more than 100 pounds per acre?"

### Other Methods of Reporting Fertilizer Use

Farmers may also report fertilizers by name. The EXHIBIT of COMMON FERTILIZERS AND THEIR PERCENT ANALYSIS on at the end of this section on page 5073 contains some of the more common fertilizers with their usual analysis.

**Anhydrous ammonia** is the strongest nitrogen fertilizer available. It must be kept (in a tank) under pressure; it is applied by injection into the ground or into irrigation water. Anhydrous is a liquid when under pressure, but turns into a gas when released and is lost if not injected into the soil. Anhydrous ammonia is a very popular fertilizer because it is often cheaper (per pound of nutrient) than other forms. It can be reported as "anhydrous", "gas", " $\text{NH}_3$ ", "82-0-0", or in "units of nitrogen" or as "pounds of actual nitrogen" (N).

**Aqua ammonia** is one of the more common types of liquid nitrogen fertilizers. It is made up of anhydrous ammonia and water and is often found in Western states. It may be reported in pounds (actual N) or gallons (material or product). Although it is a liquid, it is usually reported in pounds of actual N.

**Urea** is another commonly used nitrogen fertilizer because it has a high nitrogen analysis. It may be added through an irrigation system, usually as a nitrogen solution.

With many of the other fertilizers listed in the EXHIBIT, the analysis may vary. Probe to find out if the farmer knows the analysis or the pounds of actual nutrients applied. If he doesn't know the analysis but knows the name, use the analysis shown in this section of the manual.

**FERTILIZER TABLE      Quantity applied per acre**  
**Column 3**

If percent analysis is reported, record the amount of material applied to the selected field in terms of pounds or gallons applied per acre. If pounds of actual nutrients were reported in Column 2, this column should be left blank.

Be careful that the respondent does not give you the total amount of fertilizer applied to the entire field. If a respondent knows only the total pounds of fertilizer or plant nutrients applied to the field and not the rate per acre, you must calculate rate per acre and enter it in the table. In the margin of the form, show the computations for deriving the rate per acre.

**FERTILIZER TABLE      Material unit code**  
**Column 4**

If percent analysis is reported in column 2, record either pounds of material (code 1) or gallons of material (code 12). If pounds of actual plant nutrients are reported in column 2, enter code 19 in Column 4 and leave Column 3 blank.

**FERTILIZER TABLE      Date of application**  
**Column 5**

**V2, V5, V6, V7, V8, V9, & V10**

*Corn, Soybeans, Wheat, Cotton, Potatoes*

Ask the respondent the date the fertilizer application was made on the selected commodity field. Record the month, day and year of the reported application. Some operators will have records of fertilizer applications for each field. Be sure to encourage the respondent to use records if they are available.

If the respondent does not have records of when the fertilizer applications were done, use the CALENDAR showcard as a response aid. Many operators know when they applied fertilizer in relation to the planting date. Since you circled the planting date on this showcard at the beginning of the interview, the respondent may be able to figure out the date of each fertilizer application by thinking about it relative to the planting date.

If the operator is not able to come up with the specific date when an application was done, ask for the WEEK in which it was applied, using the CALENDAR showcard if it is helpful. Then enter the date of the WEDNESDAY of that week. For example, if the operator says that a particular fertilizer was applied during the week of April 21-27, 1996, then record 4 24 96, which is the date of the WEDNESDAY of that week.

If a fertilizer application was made over more than one day to cover the entire field, count this as one application. Enter the date of the first day of the application.

If the same fertilizer is applied at two separate times, record each application on a separate line.

**FERTILIZER TABLE      How applied**

**Column 6**

**V2, V5, V6, V7, V8, V9, & V10**

*Corn, Soybeans, Wheat, Cotton, Potatoes*

Obtain the physical application method used to apply the fertilizer to the selected field.

Show the respondent the Fertilizer/Pesticide Applications Method Codes in the Respondent Booklet. These are displayed on either the front cover or the back cover of the Respondent Booklet, depending on the commodity, so it will be easy to flip to them quickly for reference.

The Application Method codes are defined as follows:

**Code 1 - BROADCAST, GROUND WITHOUT INCORPORATION:** Fertilizer material is applied to the entire surface area by land application equipment. Application may occur either before or after planting, usually before crop emergence. No mixing of the fertilizer material into the upper soil surface is needed or planned as part of the application.

**Code 2 - BROADCAST, GROUND WITH INCORPORATION:** Fertilizer material is applied to the entire surface area by land application equipment. Application usually occurs before planting, and a planned mixing of the fertilizer into the upper soil surface is completed at the time or shortly after the time of application. Incorporation of the fertilizer into the upper soil surface is often performed with a field cultivator, disk, or other tillage implement.

**Code 3 - BROADCAST BY AIRCRAFT:** Fertilizer material is applied to the entire surface area by air application equipment. Include only those applications made by airplane or helicopter.

**Code 4 - IN SEED FURROW:** Fertilizer material is placed in the seed furrow at planting time generally through a separate attachment on the grain drill.

**Code 5 - IRRIGATION WATER:** Fertilizer material is mixed with water in either sprinkler or gravity fed irrigation systems. The term used for this procedure is fertigation. The product is metered into the water delivery system (generally a sprinkler irrigation system) and is distributed across the field in the irrigation water.

**Code 6 - CHISEL, INJECTED or KNIFED-IN:** Fertilizer material is injected under pressure into the soil. This application method (using high pressure) is often used to apply anhydrous ammonia.

**Code 7 - BANDED IN or OVER ROW:** Fertilizer material is placed in or over the crop row. This method is mainly used for row crops. Products are applied at or after planting. The area between the rows is not treated.

Fertilizer at-planting products are generally granular formulations and are placed in a 3 to 4 inch band on either side or above the seed. Early growing-season applications are also applied (either liquid or granular) on either side of the crop row.

**Code 8 - FOLIAR OR DIRECTED SPRAYS:** After planting, fertilizer material is sprayed on or under the plant foliage.

**Code 9 - SPOT TREATMENTS:** Fertilizer materials are only applied to spots in the field, even if the operator drives over the entire field to apply fertilizer only to these spots. Spot applications should not be confused with treatment of part of a field. When part of a field is treated, treated acres can usually be distinguished. For example, the north half of the field was treated. These applications are reported just like any other applications. If treatments were made with any fertilizer product to just certain spots in the selected field, calculate the quantity applied per acre by dividing the total quantity of product applied by the number of acres treated. Record this figure in Column 3 and in Column 7 enter the number of acres that actually received these spot treatments. Do not enter the total acres in the field. For example, if the operator estimates that only 6.5 acres in a 40-acre field were treated with a particular application of fertilizer, then enter 6.5 in Column 7. Spot treatments of fertilizers should be rare.

**FERTILIZER TABLE      Number of acres treated**  
**Column 7**

Record the number of acres in the selected field that were treated with the fertilizer materials recorded in Column 2. If only part of a field was treated, record only those acres. For example, if the operator made a particular application of fertilizer to only 25 acres in a 40 acre field, enter 25 in Column 7. Since each individual application of fertilizer must be recorded on separate lines, the figure entered in Column 7 can never be greater than the number of acres in the field.

Acres and tenths of acres must be reported in column 7. Zero must be recorded after the decimal point if whole acres are recorded. For example, if the operator treated exactly 25 acres, the entry in column 10 must be 25.0. Otherwise the summary will consider the entry to be 2.5 and we'll get serious errors when we summarize the N, P, K applied per acre.

**Item 2      Nitrogen inhibitor**  
**V2, V5, & V10 ONLY**  
*Corn only*

If nitrogen was applied to this field (any entry under N in Column 2 of the Fertilizer Table), then determine if any product was used to slow the breakdown of the nitrogen. If nitrogen was **not** applied, do not ask this question.

**Item 3      Soil or plant tissue test**

Many farmers have their soil or plants tested to determine soil nutrient needs or nutrient availability to the plant. The tests may be done in 1996 or in the Fall of 1995 for preparing for the 1996 crop on the field.

Plant tissue tests are done on plants during or at the end of a growing season. Analysis of plant tissues provide information on how plants are using soil nutrients and help the operator adjust fertilizer applications up or down the following year.

Operators using soil or plant tissue tests may follow different fertilizer application schedules, and apply different fertilizer types and amounts than those who use some other method for determining the fertilizer nutrients needed by their crops.

If a soil or plant tissue test was done on the selected commodity field in 1995 or 1996 for the 1996 crop on the field, enter code 1 for YES, and ask Items 3a and 3b in  $\frac{1}{2}$  CORN or  $\frac{1}{3}$  FLUE-CURED TOBACCO. If no test was done on this field, go to item 5.

**Item 3a      Cost of soil/plant tests**

**V2 & V3 only**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

Record the cost of the soil or plant tissue tests performed on the selected field for the 1996 crop of the COP commodity (corn or flue-cured tobacco). Enter cost in dollars per acre. Include the costs of tests done in 1995 for the 1996 crop on the selected field. Include landlord's cost.

If the operator is unable to provide the cost per acre for only the selected field, you may need to calculate the per acre cost by dividing the total cost for soil or tissue sampling for the operation by the number of acres on which soil or tissue sampling was done.

**Item 3b      Landlord cost for soil/plant tests**

**V2 & V3 ONLY**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

If the selected field was CASH or SHARE rented, the landlord may have paid some of the cost of the soil or plant tissue tests performed on the field for the 1996 crop. This is more common with share rented land, but it can happen in cash rental arrangements. Record the landlord's share of these costs for the selected field, either in percent or in total dollars.

**Item 4 Nitrogen test**  
**V2, V5, V6, V7, V8, V9, & V10**  
*Corn, Soybeans, Wheat, Cotton, Potatoes*

If a SOIL test for nitrogen was done on the selected commodity field, enter code 1 for YES and ask Item 4a. If no nitrogen soil test was done, go to item 5.

**Item 4a Recommended nitrogen application rate**  
**V2, V5, V6, V7, V8, V9, & V10**  
*Corn, Soybeans, Wheat, Cotton, Potatoes*

If the amount of nitrogen applied to the selected field was more than the amount recommended, enter code 1. If the amount of nitrogen applied was less than the amount recommended, enter code 2. If the amount applied was exactly the amount recommended, enter code 3.

**Item 5 Lime**

Determine if the operator ever applies lime to the selected commodity field. Enter code 1 for YES and continue. If the operator does not apply lime to this field, go to Item 8 for CORN or FLUE-CURED TOBACCO, or go to Item 6 for POTATOES, or go to Section F for ALL OTHER COMMODITIES.

**Item 5a Number of years between lime applications**

Record the average number of years between lime applications to this field.

**Item 5b Lime rate**

Record the amount of lime applied per acre to the selected commodity field the last time lime was applied. Enter tons to the nearest hundredth (for example, 2.50). If the operator responds in another unit, such as pounds or hundredweight, convert the rate to tons. For example, if the respondent reports 300 pounds per acre, then the number of tons applied per acre is  $300 \div 2000 = .15$  tons. Enter .15 in Item 5b.

**Item 5c Lime cost to landlord**  
**V2 & V3 only**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

If the selected field was CASH or SHARE rented, the landlord may have paid some of the cost of the lime and its application to the selected COP commodity (corn or flue-cured tobacco) field. This is more common with share rented land, but it can happen in cash rental arrangements. Record the percent of these costs paid by the landlord.

**Item 6        Sulfur**

**V9 & V10 ONLY**

*Potatoes only*

If sulfur (S) was applied as a specific chemical application to the selected potato field for the 1996 crop, enter code 1 for YES and ask Item 6a. If no sulfur was applied, go to Item 7.

Sulfur may be contained as part of a chemical fertilizer. In chemical fertilizers containing sulfur, it is indicated as the fourth number of a percent analysis. For example, the percent analysis for diammonium phosphate-sulfur is 16-40-0-13, which means that for every 100 pounds of this fertilizer, 16% is nitrogen (N), 40% is phosphate ( $P_2O_5$ ), none was potash ( $K_2O$ ), and 13 percent was sulfur (S).

Some common chemical fertilizers containing sulfur are ammonium sulfate or potassium sulfate. Some other fertilizers containing sulfur are listed in the EXHIBIT of COMMON FERTILIZERS AND THEIR PERCENT ANALYSIS on page 5073 at the end of this section.

**Item 6a       Sulfur rate**

**V9 & V10 ONLY**

*Potatoes only*

If sulfur (S) was applied to the selected potato field (Item 6 is code 1= YES), then determine the number of pounds of sulfur applied to the nearest tenth (for example, 2.5). If the response is in other units, convert the figure to pounds or make notes for the State Office.

If the producer does not know the quantity of sulfur, but knows that a chemical fertilizer mix containing sulfur was applied, then determine the quantity of that product and record a note on the questionnaire. Sulfur is indicated as the fourth number of a percent analysis of chemical fertilizers containing sulfur.

For example, the percent analysis for diammonium phosphate-sulfur is 16-40-0-13, which means that for every 100 pounds of this fertilizer, 16% is nitrogen (N), 40% is phosphate ( $P_2O_5$ ), none was potash ( $K_2O$ ), and 13 percent was sulfur (S).

The quantity of sulfur can be estimated from the analysis shown in the EXHIBIT on page 5073. For example, ammonium sulfate contains 24 pounds of sulfur per hundred pounds of material, ammonium thiosulfate contains 26 pounds of sulfur per hundred pound of material applied, and potassium sulfate contains 18 pounds of sulfur per hundred pounds of material applied. The percent analysis can be used in a calculation with the application rate per acre to determine the quantity of sulfur applied per acre, which is entered in Item 6a. Be sure to record in notes all the necessary information for the State Office to make calculations.

Record the amount applied this season, even though the sulfur may be used by the plant over several years. Do not allocate the amount applied this year across several seasons.

**Item 7          Micro-nutrients**

**V9 & V10 ONLY**

*Potatoes only*

If micro-nutrients were applied to the selected potato field, enter code 1 for YES.

Micro-nutrients are nutrients that plants need in only small or trace amounts. Essential micro-nutrients include boron (B), chlorine (Cl), Copper (Cu), iron (FE), manganese (Mn), molybdenum (Mo), and zinc (Zn).

**Item 8          Manure application**

**V2, V3, V5, & V10**

*Corn & Flue-Cured Tobacco only*

Determine if livestock or poultry manure was applied to the selected corn or flue-cured tobacco field. Exclude commercially prepared manure. If any type of unprocessed livestock manure (beef, dairy, hog and pigs, sheep and lambs, poultry, etc.) was applied to this field, enter code 1 for YES and continue. If none was applied, go to Item 9 on V2 and V3 or go to Section F on V5 and V10.

**Item 8a      Manure acres**

**V2, V3, V5, & V10**

*Corn & Flue-Cured Tobacco only*

Record the number of acres of the selected commodity (corn or flue-cured tobacco) field on which manure was applied. Enter acres to the nearest TENTH of an acre.

**Item 8b      Amount of manure**

**V2, V3, V5, & V10**

*Corn & Flue-Cured Tobacco only*

Record the amount of manure applied to the selected commodity (corn or flue-cured tobacco) field. Enter either total tons to the nearest hundredth (10.85 etc) **or** total gallons. Figures cannot be entered in both cells. That is, if the operator tells you that part of the total amount applied was dry, measured in tons, and part of the amount applied was liquid, measured in gallons, one of these units must be converted. Record this in notes so that the figures can be converted in the State Office to determine the total amount of manure applied to the field.

If the operator does not know the amount of manure applied to the field and it cannot be estimated, instead find out the type and number of animals that produced the manure, and for what time period (all or just part of a year). Also find out how many other acres besides the acres of this field were covered with manure produced on the operation. Make good notes of all this information. Then the amount of manure produced and spread on the field can be estimated by the Office using this information.

**Item 8c      Manure application method**

**V2, V5, & V10 ONLY**

*Corn only*

Since dry or liquid application and immediate incorporation affects runoff and nutrients available to the soil, specify whether the manure was applied dry or liquid and with or without incorporation. Also, liquid manure may be injected directly into the soil. The manure application method codes are:

- Code 1 - DRY BROADCAST WITHOUT INCORPORATION
- Code 2 - DRY BROADCAST WITH INCORPORATION
- Code 3 - LIQUID BROADCAST WITHOUT INCORPORATION
- Code 4 - LIQUID BROADCAST WITH INCORPORATION
- Code 5 - INJECTED or KNIFED IN

**Item 8d      Dates of manure application**

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**V5 & V10 ONLY**

*Corn only*

Obtain the dates of the first THREE times manure was applied to the selected corn field. Show the CALENDAR showcard to the respondent if necessary to aid determination of the dates. If the respondent can identify the WEEK in which application occurred, record the date of the WEDNESDAY of that week. Dates should be recorded in MM DD YY format. For example, if the date was March 8, 1996, enter 3 08 96.

**Item 8e Manure source livestock type**

**V2, V5, & V10 ONLY**

*Corn only*

Different types of manure have different nutrient content. Determine whether the major source of the manure applied to the selected corn field was from beef cattle, dairy cattle, hogs, sheep, poultry, or other livestock. When the **same** amount of two types have been applied, use the code for the type with the higher nitrogen value. The highest value is for poultry, followed by hogs, dairy, sheep and beef. Beef has the lowest nitrogen value.

The code list for the type of manure is:

Code 1 - BEEF CATTLE

Code 2 - DAIRY CATTLE

Code 3 - HOGS

Code 4 - SHEEP

Code 5 - POULTRY

Code 6 - OTHER type of livestock

**Item 8f Manure origin**

**V2, V5, & V10 ONLY**

*Corn only*

Determine if the manure was produced on this operation (enter code 1), purchased (enter code 2), or obtained at no cost from some other source (enter code 3).

**Item 9 Custom fertilizer application cost**

**V2 & V3 ONLY**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

Record the cost of custom application of fertilizers to the selected field of the commodity (corn or flue-cured tobacco). Record only the application cost. DO NOT include the cost of fertilizer materials. Include landlord costs. Exclude costs for custom application of lime. If material and application costs can't be separated, record the total in Item 10 and skip Item 9. Enter dollars and cents per acre or total dollars for the field.

**Item 10 Total fertilizer materials cost**

**V2 & V3 ONLY**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

Record the TOTAL MATERIALS cost for all fertilizer, soil conditioners, micronutrients, etc., applied to the selected field for the 1996 crop of the commodity (corn or flue-cured tobacco). Include materials applied to this field if it was fallow in 1995. Include landlord costs. Exclude the cost of lime or purchased manure. If custom applied, include the cost of materials ONLY, unless materials and application costs cannot be separated.

**Item 11 Total landlord custom fertilizer application cost**

**V2 & V3 ONLY**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

Ask this question only if the selected field was CASH or SHARE rented (Item 2 of Section D is code 2 or 3). In either a cash or share rent arrangement, the landlord may have paid some of the fertilizer application and materials costs. This is more common with share rented land, but it can happen in cash rental arrangements.

In Item 11, record the percent share or total landlord cost of custom fertilizer applications made on the selected field for the 1996 crop of the commodity (corn or flue-cured tobacco). Exclude material costs; these should be recorded in Item 12. Enter percent or total dollars.

**Item 12 Total landlord fertilizer materials cost**

**V2 & V3 ONLY**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

Ask this question only if the selected field was CASH or SHARE rented (Item 2 of Section D is code 2 or 3). Record the percent share or total landlord cost of fertilizer materials (fertilizers, soil conditioners, and micronutrients) applied to this field for the 1996 crop. Exclude application costs; these should be recorded in Item 11. Enter percent or total dollars.

**EXHIBIT:  
COMMON FERTILIZERS AND THEIR PERCENT ANALYSIS**

<u>NAME</u>	<u>PERCENTAGE ACTIVE INGREDIENTS</u>			
	<u>N</u>	<u>P<sub>2</sub>O<sub>5</sub></u>	<u>K<sub>2</sub>O</u>	<u>S</u>
Anhydrous ammonia	82	--	--	--
Aqua ammonia	20	--	--	--
Ammonium nitrate	33	--	--	--
Ammonium sulfate	20	--	--	--
Nitrogen solutions (28 percent)	28	--	--	--
Sodium nitrate	16	--	--	--
Urea	45	--	--	--
Urea ammonium nitrate	32	--	--	--
Super phosphate (22 % & under)	--	19	--	--
Super phosphate (over 22 %)	--	45	--	--
Triple Super Phosphate	--	46	--	--
Ammonium phosphate	16	27	--	--
Diammonium phosphate	18	46	--	--
Monammonium phosphate	11	48	--	--
Potassium chloride	--	--	--	60
Potassium nitrate	13	--	44	--
Potassium sodium nitrate	15	--	14	--
Mixed Fertilizer	2	6	12	--
	3	9	18	--
	3	10	30	--
	5	10	15	--
	5	10	30	--
	5	15	30	--
	6	24	24	--
	8	24	24	--
	9	18	9	--
Soil sulfur	--	--	--	92
Sulfur-bentonite	--	--	--	90
Sulfur dioxide	--	--	--	50
Ammonium polySulfide	20	--	--	45
Ammonium sulfate	21	--	--	24
Ammonium thiosulfate solution	12	--	--	26
Diammonium phosphate-sulfur	16	40	--	13
Potassium sulfate	--	--	49	18
Potassium-magnesium sulfate	--	--	22	22



## SECTION F - PESTICIDE APPLICATIONS

### What's this Section for? How is the information used?

Pesticide data are needed because USDA is responsible for publishing estimates of pesticide use in crop production. NASS is charged with collecting these data so that issues related to food safety, water quality, and pesticide cancellation can be evaluated. The Economic Research Service conducts research on the impact of alternative regulations, policies, and practices.

This section is similar to the fertilizer section. Chemical mixes are described and application practices are enumerated. On *Versions 2* and *3* the costs of the materials are collected. The mix information is used in non-survey years to create a cost index for updating the survey responses. Chemical costs are a large part of the variable production costs for most crops, so getting correct chemical information on expenses and usage is important.

Include all chemicals applied for the 1996 crop on the selected field. On *Versions 2* and *3*, account for the cost of all chemicals and pesticides applied during 1995 and/or 1996 for the 1996 crop on this field, even if they were purchased before 1996.

### USE OF SUPPLEMENTS

If more lines are needed than the number available in the table, use a CHEMICALS AND PESTICIDES SUPPLEMENT. Copy the identification as it appears on the main questionnaire to the identification box on the supplement. Assign the next Table number, 002, 003, 004, etc., to each additional supplement used. Begin numbering the supplements with Table 002 because Table 001 already appears in the questionnaire. Use as many supplements as you need.

#### Item 1 Pesticide applications

Determine if any pesticides were applied to the selected commodity field for the 1996 crop. Include herbicides, insecticides, fungicides, or other chemicals. **Exclude** seed treatments.

Herbicide materials may be applied before weeds emerge or after the weeds have emerged. Herbicides are also sometimes used as a "burn down" to kill weeds prior to planting in no-till systems.

Insecticide materials are applied to control insects that damage plants by feeding on plant tissues.

Fungicides are applied to control disease organisms which infect the growth and development of the plant, such as pod-and-stem blight, anthracnose, brown spot, etc.

If any pesticides were applied, check YES and complete the Pesticide Table. If no chemicals were applied, check NO and go to Section G.

On *Version 10* Multi-crop, enter code 1 for YES in the correct cell for each of the selected commodity fields. Complete the Pesticide Table for each commodity field that chemicals were applied to. If no chemicals were applied to the selected commodity field, dash the cell. If no chemicals were applied to either of the selected fields, then go to Section G.

**PESTICIDE TABLE            Commodity Code**

**Column 1**

***V10 only***

*Corn, Soybeans, Wheat, Cotton, Potatoes*

Enter the commodity code for each selected field as you enumerate the pesticide applications for that target commodity. The commodity codes are:

- Code 1 - CORN
- Code 2 - SOYBEANS
- Code 3 - COTTON
- Code 4 - WINTER WHEAT
- Code 5 - DURUM WHEAT
- Code 6 - (OTHER) SPRING WHEAT
- Code 7 - POTATOES

It may help the respondent to remember the products if you ask for the chemical applications to be listed in the sequence in which they occurred on each field. When the pesticide applications are completely enumerated for the selected [*commodity 1*] field, proceed to list the pesticide applications for the selected [*commodity 2*] field.

If the respondent remembers an additional chemical application to the selected [*commodity 1*] field after you've begun listing the applications for the [*commodity 2*] field, just record it wherever you're at in the table. Be sure to enter the correct commodity code in Column 1.

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**PESTICIDE TABLE**      **Product code**  
**Column 2**

Ask the operator to identify the chemical or pesticide products applied to the selected commodity field. Record the product code for each chemical from the Pesticide Code Lists found in the Respondent Booklet.

Many enumerators also use the NOTES column to the left of the Pesticide Table to record the product name. This makes it easier to refer to the product, by name, while asking the remaining questions in the table. It also makes it easier to identify a product and its code when the same product is reported more than once.

Each product and each application must be recorded on a separate line. If two or more products are applied with a single application (tank mix) a separate line must be used for each product. Use column 4 to identify products applied as a tank mix. Each application must be recorded on a separate line, because we are asking for the date of application in Column 5 (except on *Version 3* FLUE-CURED TOBACCO).

To help the respondent, start by asking if any pesticide products were applied in the fall of 1995. Next, ask about other preplant products and then follow with products applied at planting and then after planting. Remind the operator to report all types of pesticides, including herbicides, insecticides, fungicides, defoliants, growth regulators, and desiccants.

“Before-planting” applications may occur the same day or a week or several months before planting. If a tillage implement is used to incorporate the herbicide into the soil, be sure to record it in Section H: Field Operations.

“At-planting” herbicide or insecticide materials are applied at the time the crop is planted. These applications may be band treatments covering a small section of the row over the seed furrow or broadcast treatments covering the entire soil surface.

Exclude seed treatments. Most crop seed is treated with an insecticide/fungicide product. If the seed is purchased, seed treatment is done by the seed company prior to delivery to the operator. If the operator uses his/her own seed, it may be treated prior to going to the field or the seed may be treated in the field. Field seed treatment consists of coating the seed with the insecticide or fungicide product just prior to planting.

Herbicides applied at time of planting are generally applied to the entire soil surface (broadcast). Herbicides requiring soil incorporation may be mixed into the soil by the action of the planter or by attachments which are part of the planter. Incorporation also may be accomplished by a tandem hook-up of a tillage implement(s) behind the applicator or planter.

If a tillage implement is used in tandem with the planter it should be recorded in Section H: Field Operations. Other herbicides are effective by being left on the surface without incorporation.

Granular insecticides are sometimes applied at planting and placed in the seed row (in-furrow) by separate attachment.

“After planting” herbicide, insecticide, or fungicide material is applied after the planting operation is completed. They could be applied a few days or several weeks later.

### **Use of the Respondent Booklet**

Most of the pesticide products used on each target crop are listed in the Respondent Booklet for that commodity. It is very important to obtain the trade name as well as the formulation from the operation to insure that the proper product code is recorded. In order to report the formulation and whether the product is liquid or dry, the respondent may have to look at the product label or detailed itemized receipts for the product.

Both you and the respondent should use a Respondent Booklet. These booklets contain product code listings. Some respondents may be willing to use the booklet and to report the product code for each of the products they used. You should encourage this since it makes the job of enumeration easier as well as making reporting faster and more accurate.

To aid in identification, the products in the Respondent Booklet are categorized as LIQUID(L) or DRY(D) formulations. Ask the respondent if the product was in a liquid or dry state when it was purchased. This should help you and the respondent find and record the correct product codes.

The Respondent Booklet also lists the type or class of each product: Herbicide (H), Insecticide (I), Fungicide (F) and Other products (O). Some chemicals and pesticides have more than one use. Some products with more than one use may be listed twice if the second use is associated with a separate product code. For example,

Gramoxone Extra	H	4314
Gramoxone Extra	O	9037.

For products that are listed more once, be sure to probe for what it was used for and record the product code associated with that use.

Note that each product code listed in the Respondent Booklet specifies the trade name and formulation. The numbers and letters after the product name identify the concentration and form. For example, Canopy 75DF: Canopy is the trade name and the 75DF indicates the formulation. The 75 indicates the concentration as the percent of active ingredient in a pound of product, and the DF indicates that the form of the product is Dry Flowable. For Basagran (4L): Basagran is the trade name and the 4L indicates the formulation. The 4 indicates 4 pounds of active ingredient in a gallon of product and the L indicates a Liquid Concentrate.

Also note that for several products there is more than one formulation for a given trade name: Ambush (2EC) and Ambush 25W or Diazinon 14G and Diazinon 4E and Diazinon 50W and Diazinon AG500(4E). Different formulations of a product have different concentrations of the active ingredient and inert materials.

It is extremely important that you get the correct product code because active ingredient concentrations for different products and different formulations vary greatly. Since we summarize by active ingredient in the product, recording a product, or its formulation, incorrectly will make a difference when the active ingredient application rate per acre is calculated. For example, if you record the code for Dyfonate II20-G (1037) when you really should have recorded the code for Dyfonate II10-G (1038), then we will summarize twice the amount of active ingredient than we should. That will make it look like operators apply more chemicals to crops than they actually do.

Also, if you record the Dyfonate II10-G code when you really should have recorded the code for Dyfonate II20-G, we will summarize half as much active ingredient as we should. This is not good either. We need the correct information listed in the questionnaire.

If you cannot find a reported product in the Pesticide Code List in the Respondent Booklet, use the area below the table for notes to provide the information needed to classify and summarize unlisted products. First record the line number of the pesticide application that the information refers to. Then record what it was used for (herbicide, insecticide, fungicide). Next record the EPA registration number, if it is available, or the name and formulation of the product. Finally, record whether the product was liquid or dry when it was purchased.

The EPA Registration number is printed on the product label. EPA numbers are several digits long and look somewhat like many bank and credit card account numbers, such as 312-19-18713 and 2980-4. EPA Registration numbers are not the same thing as EPA Establishment numbers.

If the respondent does not know the EPA number or the trade name and formulation, record as much information about the product as you can, especially the "where purchased." This information will enable identification of the product in the State Office. The "where purchased" is important because if more information is needed, we can then call the dealer.

For example, if the operator has a pesticide applied by a custom applicator, he/she might not know the formulation of the product, but if the "where purchased" is recorded the State Office can check to get the correct formulation.

**EXAMPLE:** A good, complete entry for Unlisted Products in the notes portion of the section is as follows:

line 22 Danitol 2.4EC EPA# 39398-17 Insecticide Liquid

**PESTICIDE TABLE**            **Liquid or dry**

**Column 3**

Ask the respondent if the product was in a liquid or dry state when it was purchased. Record an "L" or a "D" in this column to indicate Liquid or Dry. Be sure the liquid or dry designation listed by the product code selected from the Respondent Booklet agrees with what you record here for the product.

**EXHIBIT:**  
**COMMON ABBREVIATIONS FOR FORM OF PESTICIDE PRODUCTS**

**L (Liquid)**

These products flow like water. Concentrations are usually expressed in pounds per gallon.

**E (EC)**

Emulsifiable concentrates. These are usually thicker than water and are mixed with water and applied as sprays. They contain one or more active ingredients, one or more solvents and an emulsifier. Their concentrations are generally indicated in pounds per gallon.

**F (FL) (Flowable)**

These products are in liquid form. They contain finely ground active ingredients suspended in the liquid. They are mixed with water for application. Their concentrations are indicated in pounds per gallon.

**D (Dust)**

Dusts contain a low percentage of active ingredients on a very fine dry inert carrier such as talc, chalk or clay. They are usually applied directly as purchased. Their concentrations are expressed as percents.

**WP (W), SP (S)**

Wettable or Soluble Powders. These are dry products, much like flour, which will dissolve or disperse in water. Their concentrations are indicated in percents.

**G (Granular)**

Granular products contain active ingredients coated or absorbed onto coarse particles like clay, ground walnut shells or ground corn cobs. The pellets are about the diameter of the lead in a pencil (or larger); during shipment the granules have a tendency to break down and create dust. These are used as purchased. Their concentrations are expressed as percents.

**DF (Dry Flowable),**

**WSG (Water Soluble Granules)**

Also known as water dispersible granules. These are small pellets formulated to reduce the dust problem created with granules. They are like wettable powders except that the active ingredient is formulated on a granule instead of a powder. The product pours easily into spray tanks for mixing with water. Their concentrations are expressed as percents.

**Bait**

Bait products contain active ingredients mixed with food or another attractive substance. Concentrations are expressed in percents.

**PESTICIDE TABLE      Tank mix**  
**Column 4**

Most chemicals are applied to the field as single products. However, sometimes two or more individual products are mixed in the spray tank by the farmer/custom applicator and applied to the field as a tank mix.

If products were applied in a tank mix, these must be identified as tank mixes. Since there is only space in the table for one product per line, the separate products in tank mixes must be recorded on separate lines. Identify the products in a tank mix by recording in Column 4 the line number of the first product in the tank mix.

For example, consider a tank mix where you recorded the first product on line 6, the second product on line 7 and the last product on line 8. In column 4 of line 6 you should record 6 so we will know this was the beginning of the list of products in that tank mix. In column 4 of line 7, you'll record 6 so we know that this product was part of the same tank mix that you started listing on line 6. In column 4 of line 8, you will record 6 for the same reason.

For products not applied as part of a tank mix, enter a dash in Column 4.

For the first product in a tank mix, be sure to ask each question in Columns 5-12. For each additional product in the tank mix after the first product, be sure to ask the questions in Columns 6, 7, 8, and 12, because the answers may be different than for the first product. Information recorded in Items 5, 9, 10, and 11 should be the same as for the first product in the tank mix. These data can just be copied from the entries in line for the first product.

DO NOT confuse tank-mixes and packaged premixes. A tank mix is any pesticide spray which is prepared immediately before use by mixing two or more chemicals and water in the spray tank. Packaged premixes are brand name products that contain two or more active ingredients. These are products where the manufacturer has taken individual active ingredients and combined them in a container. Examples include Ramrod/Atrazine, Lasso/Atrazine and Bicep (Dual & Atrazine). These manufactured mixes have their own code in the Respondent Booklet, so they don't have to be listed with separate codes for the chemicals included in the product.

**PESTICIDE TABLE      Date of application**  
**Column 5**

**V2, V5, V6, V7, V8, V9, & V10**

*Corn, Soybeans, Wheat, Cotton, Potatoes*

Ask the respondent the date the product was applied to the selected field. Record the month, day and year of the reported application. Because of the record keeping requirements for restricted use chemicals, most operators will have records of chemical applications for each field. Be sure to encourage the respondent to use these records if they are available.

If the respondent does not have records of when chemical applications were made, use the CALENDAR showcard as a response aid. Many operators know when they applied chemical in relation to the planting date. That is, often they know that they put down some chemical 5 days before planting, or 10 days after. Since you circled the planting date on this showcard at the beginning of the interview, the respondent may be able to figure out the date of each chemical application by thinking about it relative to the planting date.

If the operator is not able to come up with the specific date for an application, ask him/her to identify the WEEK it was made, using the CALENDAR showcard if it is helpful. Then enter the date of the WEDNESDAY of that week. For example, if the operator says that a particular chemical was applied during the week of April 21-27, 1996, then record 4 24 96, which is the date of the WEDNESDAY of that week.

If a product or tank mix was applied over more than one day to cover the entire field, count this as one application. Enter the date of the first day of the application.

If the same product is applied at two separate times, record each application on a separate line. For example, if 2,4-D was applied before planting, record it on one line. If a second application was made after planting, record it separately on another line.

**PESTICIDE TABLE                      Rate per Acre or Total Amount applied per application**  
**Columns 6 & 7**

Column 6 or Column 7 may be used for each product reported. Don't use both on the same line.

**PESTICIDE TABLE                      Rate per acre per application**  
**Column 6**

Record the chemical application rate per acre used on the selected commodity field. Rate per acre is the amount used in one application to one acre. Because rates per acre are often quite small with very toxic chemicals, rates are reported to hundredths of units. Be sure that if whole numbers are reported, zeros are entered after the decimal point.

If as application rate per acre is obtained in Column 6, then nothing should be entered in Column 7.

**PESTICIDE TABLE                      Total amount applied per application**  
**Column 7**

If the respondent is not able to provide the application rate per acre in Column, use Column 7 to record the total quantity applied per application to all acres treated in the selected commodity field. This figure should be a total quantity for **one application only**.

If the respondent is able to give either total quantity applied per application or rate per acre, select the option which the respondent feels will give the most accurate data.

In some cases, respondents cannot report either the rate per acre per application of a product or the total amount of the product applied per application. In these cases, there is one additional way you might be able to collect the data we need. If the respondent knows

- 1) the amount of the product mixed with every 100 gallons of water,
- 2) the number of gallons in each tank,
- 3) the number of tanks used to cover the acres,

make a note of these figures. The Survey Statistician will be able to calculate the amount of product used.

Other ways of reporting include parts per million (PPM) and rate per 100 gallons of water. In these cases, try to find out the amount of actual product (before mixing with water) used, and write lots of notes.

Do not record the spray volume applied to the field. The purchased (concentrated) product is mixed with water and the diluted spray solution is generally applied at rates of 20 - 60 gallons per acre with ground equipment and 5 - 10 gallons per acre by air.

Do not record the inclusion of surfactants or crop oil in the spray solution. They are added to the spray solution to enhance the ability of the pesticide to stick to the foliage and/or aid in the absorption into the plant system.

Do not record liquid fertilizer solutions applied in conjunction with a pesticide in the Pesticide Table. The information on liquid fertilizers should be recorded in the Fertilizer Table.

**PESTICIDE TABLE            Unit code**  
**Column 8**

Record the units using the unit codes listed in Column 8. The unit codes are:

- Code 1 - POUNDS
- Code 12 - GALLONS
- Code 13 - QUARTS
- Code 14 - PINTS
- Code 15 - OUNCES
- Code 30 - GRAMS

Please write notes if any unit other than the ones listed is reported.

When the reported unit is quite small, you may need to make conversions. Some conversion factors you may need to use are:

LIQUID PRODUCTS

1 GALLON = 4 QUARTS

1 QUART = 2 PINTS

1 PINT = 16 fluid ounces

DRY PRODUCTS

1 POUND = 16 dry ounces

Be sure to keep the unit code and product formulation consistent. If the operator purchased a LIQUID pesticide product, the unit code must be for ounces, pints, quarts, or gallons. If a DRY pesticide product (granular, wettable powder, or dry flowable) was used the unit code must be for ounces or pounds.

**PESTICIDE TABLE      How applied**

**Column 9**

**V2, V5, V6, V7, V8, V9, & V10**

*Corn, Soybeans, Wheat, Cotton, Potatoes*

Obtain the physical application method used to apply the pesticide product to the selected field. The application methods codes are printed in the **APPLICATION CODES** box positioned above Column 9 of the Pesticide Table.

Show the respondent the Fertilizer/Pesticide Applications Method Codes in the Respondent Booklet. These are displayed on either the front cover or the back cover of the Respondent Booklet, depending on the commodity, so it will be easy to flip to them quickly for reference.

Herbicides, insecticides, and fungicides are most often applied as broadcast treatments which cover the entire soil surface with the pesticide material. Band treatments, where a narrow band of pesticide is applied over the row covering about one-third of the soil surface, is also a common method of application. Less frequent methods include in-furrow, with irrigation water, or as spot treatments.

The Application Method codes are defined as follows:

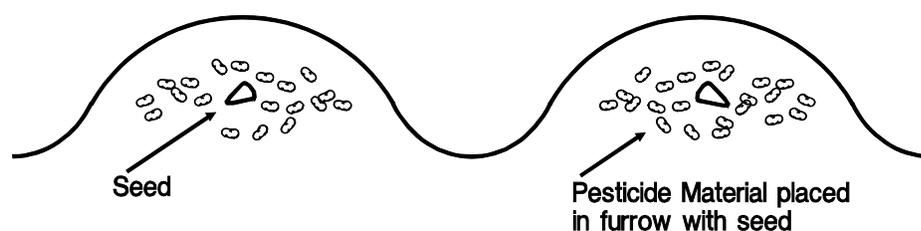
**Code 1 - BROADCAST, GROUND WITHOUT INCORPORATION:** Pesticide material (herbicide, insecticide, fungicide, or other) is applied to the entire surface area by land application equipment. Application may occur either before or after planting, usually before crop emergence. No mixing of the pesticide material into the upper soil surface is needed or planned as part of the application.

**Code 2 - BROADCAST, GROUND WITH INCORPORATION:** Pesticide material (herbicide, insecticide, fungicide, or other) is applied to the entire surface area by land application equipment. Application usually occurs before planting, and a planned mixing of the pesticide into the upper soil surface is completed at the time or shortly after the time of application. Incorporation of the pesticide into the upper soil surface is often performed with a field cultivator, disk, or other tillage implement.

**Code 3 - BROADCAST BY AIRCRAFT:** Pesticide material (herbicide, insecticide, fungicide, or other) is applied to the entire surface area by air application equipment. Include only those applications made by airplane or helicopter.

**Code 4 - IN SEED FURROW:** Pesticide material (herbicide, insecticide, fungicide, or other) is placed in the seed furrow at planting time generally through a separate attachment on the grain drill. This method is sometimes used for granular insecticides applications.

**Do not** confuse this with seed treatments where the seed surface is coated with a pesticide product by the farmer or seed dealer before the seed is put in the planter box. Do not record seed treatments.



**Code 5 - IRRIGATION WATER:** Pesticide material (herbicide, insecticide, fungicide, or other) is mixed with water in either sprinkler or gravity fed irrigation systems. The term used for this procedure is chemigation. The product is metered into the water delivery system (generally a sprinkler irrigation system) and is distributed across the field in the irrigation water.

**Code 6 - CHISEL, INJECTED or KNIFED-IN:** Pesticide material (herbicide, insecticide, fungicide, or other) is injected under pressure into the soil. This application method (using high pressure) is used with pesticide spray materials for nematode control.

**Code 7 - BANDED IN OR OVER ROW:** Pesticide material (herbicide, insecticide, fungicide, or other) is placed in or over the crop row. This method is mainly used for row crops. Products are applied at or after planting. The area between the rows is not treated. Weed control between rows is accomplished with mechanical cultivation.

Application rates for band treatments are to be reported on a per acre basis and not the rate that was applied to the banded segment. Band treatments with the same pesticide product normally result in lower application rates than broadcast treatments. For example, if the band only covers one-third of the row, the application rate will normally be about one-third the broadcast application rate.

At or after planting herbicides materials are applied by spraying the product in an 8 to 12 inch band over the crop row.

At planting insecticide and fungicide applications are generally placed in a 4 to 6 inch band directly behind the planter shoe and in front of the press wheel.

Code 8 - FOLIAR OR DIRECTED SPRAYS: After planting, pesticide material ( herbicide, insecticide, or fungicide) is sprayed on or under the plant foliage.

Code 9 - SPOT TREATMENTS: Pesticide material are only applied to "hot" spots in the field, even if the operator drives over the entire field looking for the hot spots. Spot herbicide applications are generally made to control problem weeds. Spot insecticide applications are sometimes made to control grasshoppers in the edges of the field. It is doubtful if any spot treatment of fungicides would ever be made.

### SPECIAL INSTRUCTIONS FOR RECORDING SPOT TREATMENTS

Spot applications should not be confused with treatment of part of a field. When part of a field is treated, treated acres can usually be distinguished. For example, the north half of the field was treated. These applications are reported just like any other applications. For spot applications, acres are usually very difficult to define. Usually spot treatments involve workers walking around with tanks on their backs spraying areas which appear to have infestations for which the treatment is being made. This may mean that ten little areas throughout the field were treated, and none of those areas may be near each other.

Spot treatments are most common on cotton, soybeans, and potatoes, especially for herbicide applications to kill large weeds which may interfere with the crop growth or harvesting. If treatments were made with any product to just certain spots or selected plants in the selected field (hence the term spot treatment), record in Column 7 the total quantity of product applied, and in Column 10 enter the total number of acres **in the field** in which spot treatments were made.

If rates per acre are reported for spot applications, probe to determine the actual total quantity of product applied. For these applications, rate per acre multiplied by the total acres over which the spot treatments were made **does not equal** the total quantity applied. In fact, the result of such a calculation is greater than the actual total quantity applied. This is because not all of the acres in the field were treated in spot applications.

**Do not** record a rate per acre in Column 6 for spot treatments. Enter only the total amount applied (Column 7) for spot treatments.

### PESTICIDE TABLE      Acres treated Column 10

Record the number of acres in the selected field that were treated with the pesticide product recorded in Column 2. This will be the same as the number of planted acres recorded for the field when the

entire field was treated with the pesticide. If only part of the selected field was treated, then enter the number of acres representing the share of the field actually treated.

Here it is important to know the difference between treated acres and treatment acres. Treated acres are the actual physical (land) acres of crop which were treated – it doesn't matter how many times they were treated, they are only counted once. Treatment acres are the total number of acres covered by applications of a product regardless of whether they are the same acres or different acres. If the same 40 acres are treated 4 times, the number of treated acres is 40 and the treatment acres is 160 (4 x 40). In this example 40 acres would be recorded. **Never record treatment acres in these questionnaires.**

Acres and tenths of acres must be reported in column 10. Zero must be recorded after the decimal point if whole acres are recorded. For example, if the operator treated exactly 25 acres, the entry in column 10 must be 25.0. Otherwise the summary will consider the entry to be 2.5 and we'll get serious errors when we summarize active ingredients applied per acre.

**PESTICIDE TABLE            Who applied**

**Column 11**

**V2, V5, V6, V7, V8, V9, & V10**

*Corn, Soybeans, Wheat, Cotton, Potatoes*

For each individual treatment, record who made the pesticide application on the selected field. The codes to identify who applied the chemicals are:

Code 1 - OPERATOR, PARTNER, or FAMILY MEMBER

Code 2 - CUSTOM APPLICATOR

Code 3 - EMPLOYEE or some OTHER person.

**PESTICIDE TABLE            Primary target pest**

**Column 12**

**V2, V5, V6, V7, V8, V9, & V10**

*Corn, Soybeans, Wheat, Cotton, Potatoes*

Ask the operator to identify the primary target pest for which the product in Column 2 was applied. Use the Target Pest Code List, which is printed on the back side of the CALENDAR showcard. (The Target Pest Code List was placed on a separate showcard to avoid having to flip several pages in the Respondent Booklet while completing the Pesticide Table.)

If the respondent indicates that there were several pests for which a specific application was targeted, ask him/her to select the main one, or the most important one, for that product application. Only report general pest categories, such as broadleaf weeds, grasses, etc., when the respondent cannot identify a more specific target pest.

**PESTICIDE TABLE                      Optional Item 4**

**Dashed Column**

**V2 & V3 ONLY**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

Refer to the instructions for Item 4 below. **This Dashed Column: Optional Item 4, should only be used if the operator is unable to report the cost per acre for chemical and pesticide materials in Item 4.**

If it becomes necessary to use this column, then ask the respondent for the cost per unit paid for each chemical applied to the specific field. Frequently operators who are unable to report the Dollar Per Acre or Total cost of chemicals do know the cost per unit they paid for each product they applied to the field. Or they have records or receipts that tell the product cost of these chemicals. Enumerators sometimes use this information to calculate the cost per acre, multiplying it times the application rate per acre reported in Column 6. Recording this information in the Dashed Column: Optional Item 4 saves enumerators from doing this calculation, because the computer can calculate the figure using the information recorded in the table. However, the Dashed Column: Optional Item 4, should only be used as a last resort, because operators may have a more accurate figure available that includes materials not captured in the Pesticide Table.

**Item 2                      Boom height of sprayer**

**V5, V6, V7, V8, V9, & V10**

*Corn, Soybeans, Wheat, Cotton, Potatoes*

If the application method for any chemical on the selected commodity field was broadcast, ground without incorporation (code 1), broadcast, ground with incorporation (code 2), banded in or over row (code 9), foliar or directed spray (code 8), or spot treatment (code 9), record the boom height in inches of the sprayer used to apply chemicals on the first of these applications. You may want to refer to Column 5 of the Pesticide Table and remind the operator of the date of that application and what it was.

Boom height can affect the amount of pesticide spray that may drift onto areas adjoining the target area for pesticide application. This drift can affect the soil, water, and air quality of these nearby areas.

**Item 3          Pesticide custom costs**  
**V2 & V3 ONLY**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

Record the amount spent for CUSTOM APPLICATION of chemicals and pesticides on the selected commodity (corn or flue-cured tobacco) field for the 1996 crop. Include landlord cost. Record only the application cost. Do NOT include the cost of pesticides or chemical materials. Include landlord costs. Record in dollars and cents per acre or in total dollars for the field.

If material and application costs can't be separated, record the total in item 4 and skip item 3.

In *Version 2* CORN, you will know if any of the pesticide applications were made by custom applicators by looking at Column 11 in the Pesticide Table. In *Version 2*, ask this question only if any CUSTOM applications were reported (code 2 entered in column 11).

**Item 4          Pesticide material costs**  
**V2 & V3 ONLY**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

Record the TOTAL MATERIALS cost for all insecticides, herbicides, fungicides, surfactants, wetting agents, defoliant and growth regulators applied to the selected commodity (corn or flue-cured tobacco) field for the 1996 crop. Include landlord costs. Include materials applied to this field if it was fallow during 1995. Include materials applied to this field before planting. If custom applied, include the cost of materials ONLY, unless materials and application costs cannot be separated. Record the cost in dollars and cents per acre or in total dollars for the field.

Many operators know the cost per acre of chemicals and pesticides applied on their fields. Some operators will have records of chemical applications and the costs of chemicals applied on each field. Be sure to encourage the respondent to use records if they are available. You should always attempt to get the best figures from the respondent using this item.

However, if the operator is unable to report the cost per acre or the total cost for chemical and pesticide materials used on the selected field, use the Dashed Column: Optional Item 4 in the Pesticide Table. Ask the respondent for the cost per unit paid for each chemical listed in the Pesticide Table and record this on the correct line in the Dashed Column: Optional Item 4. Frequently operators who are unable to report the Dollar Per Acre or Total cost of chemicals do know the cost per unit they paid for each product they applied to the field. Or they have records or receipts that tell the product cost of these chemicals. Enumerators sometimes use this information to calculate the cost per acre, multiplying it times the application rate per acre reported in Column 6. Recording this information in the Dashed Column: Optional Item 4 saves enumerators from doing this calculation, because the computer can calculate the figure using the information recorded in the table.

**The Dashed Column: Optional Item 4 should only be used as a last resort**, because operators may have a more accurate figure available that includes materials which are not captured in the Pesticide Table (such as surfactants and wetting agents).

**Item 5            Total landlord custom pesticide application cost  
V2 & V3 ONLY**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

Ask this question only if the selected field was CASH or SHARE rented (Item 2 of Section D is code 2 or 3). In either a cash or share rent arrangement, the landlord may have paid some of the pesticide application and materials costs. This is more common with share rented land, but it can happen in cash rental arrangements.

In Item 5, record the percent share or total landlord cost of custom pesticide applications made on the selected commodity (corn or flue-cured tobacco) field for the 1996 crop. Exclude material costs; these should be recorded in Item 6. Record percent or total dollars.

**Item 6            Total landlord pesticide materials cost  
V2 & V3 ONLY**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

Ask this question only if field was CASH or SHARE rented (Item 2 of Section D is code 2 or 3). Record the percent share or total landlord cost of pesticide materials applied to the selected commodity (corn or flue-cured tobacco) field for the 1996 crop. Exclude application costs; these should be recorded in Item 5. Record percent or total dollars.

## **SECTION G - PEST MANAGEMENT PRACTICES**

**Version 2: Corn Production Practices & Costs Report**

**Version 5: Corn Production Practices Report**

**Version 6: Soybeans Production Practices Report**

**Version 7: Wheat Production Practices Report**

**Version 8: Cotton Production Practices Report**

**Version 9: Potatoes Production Practices Report**

**Version 10: Crop Production Practices Report (MULTI-CROP)**

### **What's this Section for? How is the information used?**

This section will provide data about pest management practices that growers use on their crops, either as alternatives to pesticides or practices which improve the effectiveness of pesticides. This information provides researchers with better information to analyze the effectiveness and performance of alternative pesticide treatment strategies as well as their potential impacts on the environment and public health.

Several years ago, USDA, along with the U.S. Environmental Protection Agency and the Food and Drug Administration, presented joint testimony to Congress on a new, comprehensive, interagency effort designed to reduce the pesticide risks associated with agriculture. The threefold goal of this effort is "1) to discourage the use of higher risk products; 2) to provide incentives for the development and commercialization of safer products; and 3) to encourage the use of alternative control methods which decrease the reliance on toxic and persistent chemicals". This joint testimony also expressed support for 'integrated pest management', and set the goal of developing and implementing Integrated Pest Management (IPM) programs on 75 percent of total U.S. crop acreage by the year 2000.

Integrated Pest Management (IPM) is an approach used by farm operators to control pests in an environmentally responsible manner. IPM combines biological, cultural, and chemical methods of pest control such as monitoring of pest populations and use of natural enemies of pests. Other methods are use of cultural controls including pest resistant crop varieties or traditional plowing and crop rotation, and use of pesticides when necessary.

Some producers may hire professionals to check their fields to determine the presence of pests. Proper identification of pest problems may potentially reduce pesticide usage. These issues relate to and address food safety, water quality, and pesticide regulation. Data from these questions will provide vital information to address these concerns.

**Item 1            Introduction and definition of pests**

This item introduces this section about pest management practices. The introductory statement does two things to help the respondent: 1) It explains that you will be shifting gears for a while and asking the operator about what the pest management practices are that are used on the selected field and about how decisions were made regarding those practices. 2) It defines PESTS for the operators to include WEEDS, INSECTS, AND DISEASES. Frequently, many operators tend to focus on one kind of pest, depending on the crop, but they are concerned about other types of pests as well. For example, corn growers may tend to only think about weeds as pests; cotton growers may focus only on insects as pests. But in this section, when the word PESTS is used, it refers to ALL three kinds, WEEDS, INSECTS, AND DISEASES. If you don't define that for all operators, they may only answer the questions for one kind of pest.

**Item 2            Commodity Name**  
**V10 ONLY**

In the header over the **lefthand** set of Columns 2 and 3, write in the name and enter the commodity code for target *commodity 1*. Then complete these columns of Items 1a-c for that target commodity.

In the header over the **right-hand** set of Columns 2 and 3, write in the name and enter the commodity code for target *commodity 2*. Then complete these columns of Items 1a-c for that target commodity.

If you accidentally reverse the order of the commodities, for example, because the respondent answers for the target commodity 2 field first, simply record in the appropriate header the name of the commodity for which Items 1a-c are answered, and enter the associated commodity code so the computer will get it straight. You don't need to transfer data just because the order of commodity 1 and 2 were accidentally reversed.

The Commodity Codes for the target commodities are:

- Code 1 - CORN
- Code 2 - SOYBEANS
- Code 3 - COTTON
- Code 4 - WINTER WHEAT
- Code 5 - DURUM WHEAT
- Code 6 - (OTHER) SPRING WHEAT
- Code 7 - POTATOES

**Item 2        Scouting**  
**Columns 1 & 2**

Determine if the selected field was scouted for weeds or insects or diseases. Scouting is checking a field for the presence, population levels, activity, size and/or density of weeds, insects, or diseases. A variety of methods can be used to scout a field. For example, the methods used to scout for insect pests include sweep nets, leaf counts, plant counts, soil samples, and general observation.

For each type of pest (weeds, insects, diseases) for which the field was scouted, enter code 1= YES in Column 2, and ask Column 3 for weeds and insects. If no scouting was done, go to Item 6.

**Item 2        Who scouted**  
**Column 3**

Find out from the respondent who did the majority of the scouting in the field for weeds and/or insects, whichever was scouted according to the answer YES=1 recorded in Column 2. If two or more people did equal amounts and there is no clear-cut major "scouter", enter the first (lowest) code of those scouting. If the operator, a partner, or a family member did the most scouting, enter code 1. If most was done by an employee (other than the operator, a partner, or a family member), enter code 2. If most of the scouting was done by the dealer or an employee of a farm supply or chemical company, enter code 3. If a hired crop consultant or a commercial scouting service was used, enter code 4.

Column 3 is not completed for scouting done for diseases.

On *V5* CORN and *V10* MULTI-CROP, if seed corn was grown on the selected field and the contractor provided the scouting services for the field, enter code 4 for CROP CONSULTANT OR COMMERCIAL SCOUT.

**Item 3        Scouting Cost**

Ask this question only if a hired crop consultant or commercial scout did most of the scouting for weeds or insects (code 4 appears in Column 3 of Item 2). Be sure to enter the cost per acre in dollars and cents or the total cost for scouting services on this selected field. **Include** landlord cost.

If Column 3 of Item 2 does not contain a code 4, then go to Item 4 for CORN **or** go to Item 5 for ALL OTHER CROPS.

On *V5* CORN and *V10* MULTI-CROP, if **seed corn** was grown on the selected field and the operator does not know the cost of the scouting services because they were provided by the contractor, be sure to make notes and record DK (Don't Know) to indicate that the operator did not know the cost.

**Item 3a        Insect scouting cost**

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**V2, V5, & V10 ONLY**

*Corn only*

Record the percentage of the total scouting cost entered in Item 3 that was for insect scouting. Ask the respondent to give a best estimate if exact figures are not available.

**Item 3b Landlord's share of scouting cost**

**V2 ONLY**

*Corn Production Practices & Costs only*

If the selected field was rented, ask the amount paid by the landlord for scouting services on this field. The response may be recorded as the **percent** of the cost entered in Item 3 that was paid by the landlord, or enter the total dollars paid by the landlord for scouting services on this field.

**Item 4 Hours Spent Scouting**

**V2, V5, & V10 ONLY**

*Corn only*

Ask this question for the selected CORN field only if the operator, a partner, a family member, or an employee did the scouting (code 1 or 2 appears in Column 3 of Item 2). Determine the total number of hours spent scouting this field for all pests during the entire season.

Obtain the total hours spent scouting. If scouting was done by more than one person of the type recorded in Column 3 of Item 2, obtain the total hours spent by all of these people. For example, if two employees scouted the corn on the selected field, one for 1 hour and the other for 2 hours, enter 3 in Item 4.

Both Item 4 and Item 3 may contain positive answers. For example, if the operator did the scouting for weeds and a scouting service did the scouting for insects, then both Items 3 and 4 would be answered.

**Item 5 Pest records**

**V2, V5, V6, V7, V8, V9, & V10**

*Corn, Soybeans, Cotton, Wheat, Potatoes*

If this field was scouted for pests (Column 2 of Item 2 contains a positive entry), determine if some type of formal or organized written, electronic, or mapped records were kept for this field of specific pest activity, infestation levels or numbers of each type of pest listed. If the selected field was not scouted at all for pests (Column 2 of Item 2 is NO for weeds, insects, and diseases), then skip Item 5 and go to Item 6.

Chapter 5  
Section G

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Each of the individual items 5a, 5b, 5c, 5d, 5e, 5f and 5g must be asked. This is not a multiple choice question -- that is, there may not be just one single answer. The operator may keep records for one or more of the pests listed. Enter code 1 = YES for each pest for which records are kept.

For CORN, ask Item 5 for

- a. broadleaf weeds,
- b. grass weeds,
- d. black cutworms,
- e. corn rootworms,
- f. European corn borers,
- g. spider mites.

For SOYBEANS, COTTON, WHEAT, and POTATOES, ask this question for

- a. broadleaf weeds,
- b. grass weeds,
- c. insects.

In Item 5, we only want organized or formal records, not just notes jotted down on scraps of paper. It doesn't matter by who kept the records -- it can be the operator or someone else.

A specific example of keeping formal pest records comes from the North Carolina Cooperative Extension Service. Three steps are recommended to scout for weeds: (1) make at least 10 stops in each field; (2) at each stop, mark off approximately 30 feet of row (10 paces); (3) record the type and number of weeds found within a 1-foot band in the row. Then record the scouting results on a "weed threshold worksheet" like the one below:

Weed	Number Counted	Number of Stops	Number of Weeds per Stop
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

The information recorded on the worksheet is used with other information to determine whether an herbicide treatment is necessary.

**Items 6,7, 8, & 9                      Herbicide use**  
**V2, V5, V6, V7, V8, V9, & V10**

*Corn, Soybeans, Cotton, Wheat, Potatoes*

**AND**

**Item 10**

**V2, V5 & V10 only**

*Corn*

If any HERBICIDES were recorded in the Pesticide Table in Section F, then these questions must be asked. Check back to responses recorded in Column 2 of Item 1 of Section F. All herbicide products have a code number in the series 4000-4999. If no HERBICIDES were used, then go to Item 11 for CORN or go to Item 12 for ALL OTHER CROPS.

**Item 6                      Pre-emergence herbicides**

Ask the operator if herbicide applications were made on the selected field **before** weeds emerged. If yes, enter code 1 and ask Item 7. If no, go to Item 8.

**Item 7a, 7b, Reasons for applying pre-emergence herbicides**  
**7c, & 7d**

Items 7a, 7b, 7c and 7d obtain the reason or reasons the operator had for using pre-emergence herbicides on the selected field. Each of the individual items 7a, 7b, 7c, and 7d must be asked. This is not a multiple choice question -- that is, there may not be just one single answer.

The operator may have more than one reason for applying pre-emergence herbicides. Enter code 1= YES for each reason the operator used. It is also possible for the operator to say NO to all items 7a-d. If this happens, it will be apparent that the operator bases decisions on some reason besides those named in Items 7a-d, because these are all NO.

In Item 7a, if the operator's reason for using pre-emergence herbicides was because it was a routine treatment for weed problems observed in previous years, enter code 1 for YES.

In Item 7b, if the operator based the decision to apply pre-emergence herbicides on a map drawn of the field indicating locations where specific weed species were present the previous year, enter code 1 for YES. These areas could be "spot treated" this year with selective herbicides.

In Item 7c, determine if a computerized decision model was used to aid the operator's decision to apply pre-emergence herbicides to this field. An example of what a computerized decision model can do is to determine whether or not it is cost effective to manage weeds in a field and identify the most cost effective treatment (broadcast or band applied herbicides or cultivation).

In Item 7d, determine if recommendations from an independent crop consultant were considered in the operator's decision to apply pre-emergence herbicides. Do not include recommendations or consultation with a farm supply or chemical dealer. Include only services for which the operator paid.

### **Item 8            Post-emergence Herbicides**

Ask the operator if herbicide applications were made on the selected field **after** weeds emerged. If yes, enter code 1 and ask Item 9. If no, go to Item 10 for CORN or go to Item 12 for ALL OTHER CROPS.

### **Item 9a, 9b, Reasons for applying post-emergence herbicides 9c, & 9d**

Items 9a, 9b, 9c and 9d obtain the reason or reasons the operator had for using post-emergence herbicides on the selected field. Each of the individual items 9a, 9b, 9c, and 9d must be asked. This is not a multiple choice question -- that is, there may not be just one single answer. The operator may have more than one reason for applying post-emergence herbicides. Enter code 1= YES for each reason the operator used. It is also possible for the operator say NO to all items 9a-d. If this happens, it will be apparent that the operator bases decisions on some reason besides those named in Items 9a-d, because these are all NO.

In Item 9a, if the operator's reason for using pre-emergence herbicides was because it was a routine treatment, enter code 1 for YES.

In Item 9b, if the operator based the decision to apply post-emergence herbicides on the weed species or type of weed being present and/or the density or extent of the weed infestation, enter code 1 for YES. The type of weeds present normally determines which herbicide product to use. The density of the weeds would probably be the basis for the application rate per acre used in the treatment.

In Item 9c, determine if a computerized decision model was used to aid the operator's decision to apply pre-emergence herbicides to this field. An example of what a computerized decision model can do is to determine whether or not it is cost effective to manage weeds in a field and identify the most cost effective treatment (broadcast or band applied herbicides or cultivation).

In Item 9d, determine if recommendations from an independent crop consultant were considered in the operator's decision to apply pre-emergence herbicides. Do not include recommendations or consultation with a farm supply or chemical dealer. Include only services for which the operator paid.

### **Item 10            Herbicide resistant weeds V2, V5, & V10 ONLY *Corn only***

Repeated use of the same pesticide product may lead to the development of resistance in the target pest. Over time some weeds will develop resistance to certain herbicides.

To date, the main families of herbicides affected are the triazines and those within the group of ALS inhibitors.

**Item 10a     Triazine resistant weeds**  
**V2, V5, & V10 ONLY**  
*Corn only*

Determine if any weeds in the selected CORN field were resistant to triazine herbicides.

A partial list of the triazine herbicides are as follows:

<u>TRIAZINES</u>	<u>PRODUCT NAMES</u>
Anilazine	<b>Dyrene</b>
Ametryn	(discontinued)
Atrazine	<b>AAtrex, Atrazine</b>
Cyanazine	<b>Cycle</b>
Cyromazine	<b>Armor, Trigard</b>
Desmetryn	<b>Semeron</b>
Prometryn	<b>Caparol, Cotton-Pro</b>
Simazine	<b>Princep, Caliber 90</b>
Terbutryn (Terbumeton)	<b>Caragard</b>

**Item 10b     Weeds resistant to ALS herbicides**  
**V2, V5, & V10 ONLY**  
*Corn only*

Determine if any weeds in the selected CORN field were resistant to any ALS herbicides or ALS inhibitors (Amino Acid Synthesis Inhibitors).

There are three types of ALS herbicides -- imidazolinones, sulfonylureas, and sulfonamides. A partial list of the ALS inhibiting herbicides are as follows:

**ALS INHIBITING HERBICIDES**

<u>SULFONYLUREA</u>	<u>PRODUCT NAMES</u>
Halosulfuron-methyl	<b>Permit</b>
Nicosulfuron	<b>Accent</b>
Primisulfuron	<b>Beacon</b>
Rimsulfuron	<b>Basis</b>

IMIDAZOLINONE

Imazethapyr                      **Pursuit, Pursuit Plus, Passport, Resolve + Dicamba**

TRIAZOLOPYRIMIDINE SULFONANILIDE (SULFONAMIDE)

Flumetsulam                      **Broadstrike**

**Item 11, 11a, & 11b                      Corn rootworm control**  
**V2, V5, & V10 ONLY**  
*Corn only*

These items determine what method the operator uses for controlling corn rootworm on the selected CORN field. If the operator answers YES to Item 11, then Items 11a and 11b may be skipped. If the operator answers YES to Item 11a, then Item 11b may be skipped.

It is possible that the operator is not using these three methods to control corn rootworm on the field. In this case, all three items will be NO. However, it is not possible to answer YES to more than one of these items.

In Item 11, determine if the operator routinely uses a soil insecticide at planting time to control corn rootworm on this field. If YES, enter code 1 and go to Item 14 in V2 CORN PRODUCTION PRACTICES & COSTS, or go to Item 12 for ALL OTHER CROPS. If NO, continue with Item 11a.

In Item 11a, determine if the operator scouted the selected field for adult corn rootworm beetles during the 1995 growing season to determine the need for a soil insecticide when planting the 1996 corn crop. If YES, enter code 1 and go to Item 14 in V2 CORN PRODUCTION PRACTICES & COSTS, or go to Item 12 for ALL OTHER CROPS. If NO, continue with Item 11b.

In Item 11b, determine if the operator scouted the selected field for adult rootworm beetles during the 1996 growing season to determine the need for a soil insecticide. If YES, enter code 1 and continue with the next item. If NO, continue with the next item.

**Item 12a, 12b,                      Insecticide decision**  
**12c, & 12d**  
**V6, V7, V8, V9, & V10**  
*Soybeans, Wheat, Cotton, Potatoes only*

Every operator decides whether or not to apply insecticides. That is, an operator may decide to apply insecticides or he/she may decide to not apply insecticides. This series of questions is to find out the operator's reasons **to apply OR not to apply** insecticides to the selected field. These questions must be asked even if no insecticides were listed in the Pesticide Table (Item 1) in Section F. This would be an example of an operator who decided to not apply insecticides, and now you're going to find out if any of the Items 12a-d were the reasons.

Items 12a, 12b, 12c and 12d obtain the reason or reasons the operator had for using or not using insecticides on the selected field. Each of the individual items 12a, 12b, 12c, and 12d must be asked. This is not a multiple choice question -- that is, there is no single right answer.

An operator who decided to not apply insecticides may have evaluated one or more of these criteria to make the decision. So may have an operator that decided to apply insecticides. More than one of the listed reasons may have been considered. Enter code 1= YES for each reason the operator used. It is also possible for the operator to say NO to all items 12a-d. If this happens, it will be apparent that the operator based the decision to apply or not apply insecticides on some reason besides those named in Items 12a-d, because these are all NO.

In Item 12a, determine if the operator used scouting data and compared it to University or Extension guidelines for infestation thresholds. One operator may have considered this criteria and decided to not apply insecticides. Another operator may have considered this information and decided to apply insecticides. If this criteria was the reason for the operator's decision, enter code 1 for YES.

In Item 12b, enter code 1= YES if the operator decided to apply (or not apply) insecticides because this was standard practice or because there was (or was not) a history of insect problems on this field. (For example, in the operator's opinion, the history of insect problems on this field may not have been severe enough to apply insecticides).

In Item 12c, determine if the operator's decision to apply (or not apply) insecticides to this field was based on local information (from other farmers, radio, TV, newsletters, etc.) that the pest was or was not present.

In Item 12d, enter code 1= YES if the operator's own determination of the infestation level was a reason for the decision to apply (or not apply) insecticides to the selected field.

### **Item 13      Row cultivation**

**V5, V6, V8, V9, & V10**

*Corn, Soybean, Cotton, & Potatoes only*

Determine whether this field was row cultivated for weed control or to rebuild ridge during the growing season. If YES, enter code 1 and ask Item 13a. If NO, go to Item 14 for CORN **or** go to Item 15 for ALL OTHER CROPS.

**NOTE:** On *Version 6: SOYBEAN PRODUCTION PRACTICES*, the printed skip instruction for NO incorrectly says to go to Item 14. **The instruction should read: [Go to item 15].**

**Item 13a Dates of row cultivation**  
**V5, V6, V8, V9, & V10**  
*Corn, Soybean, Cotton, & Potatoes only*

Obtain the dates of the first THREE times the field was cultivated. Show the CALENDAR showcard to the respondent if necessary to aid determination of the dates. If the respondent can identify the WEEK in which cultivation occurred, record the date of the WEDNESDAY of that week. Dates should be recorded in MM DD YY format. For example, if the date was June 16, 1996, enter 6 16 96.

**Item 14 Pest control procedures**  
**Columns 1 & 2**  
**V2, V5, & V10 ONLY**  
*Corn only*

The series of Items 14a-f asks if the operator used a variety of procedures and practices for the purpose of controlling pests on the selected field. If the procedure was used for this purpose, enter code 1 in Column 2 for YES and ask column 3. If the procedure was not used for the purpose of controlling pests, then enter a dash for NO and continue with the next item.

In some cases, the operator may have used a particular procedure, but not for the purpose of controlling pests. If this is the case, probe to verify that the operator's purpose was other than to control pests, by saying, for example, "Did you do that to control pests?" If the purpose for the procedure was not for controlling pests, then the answer to the question is NO and a dashed entry should be made.

**Item 14 Reason for pest control procedures**  
**Column 3**  
**V2, V5, & V10 ONLY**  
*Corn only*

If code 1 for YES is entered in Column 2, ask this question to determine if the main reason for the operator's use of the particular procedure was to control WEEDS (enter code 1), INSECTS (enter code 2), or BOTH weeds and insects (enter code 3).

**Item 14a Row spacing & plant density**

**V2, V5, & V10 ONLY**

*Corn only*

Find out if row spacing (width) or plant density (planting rate in seeds per acre) was adjusted in this field for the purpose of controlling pests.

**Item 14b Adjust Planting date**

**V2, V5, & V10 ONLY**

*Corn only*

Find out if the planting date was adjusted in this field for the purpose of controlling pests.

**Item 14c Alternate Pesticides**

**V2, V5, & V10 ONLY**

*Corn only*

Find out if the pesticide products were alternated in this field from year to year for the purpose of slowing the development of pest resistance. To alternate pesticides means to use products with different active ingredients or from different pesticide families.

**Item 14d Prevent Spreading of pests**

**V2, V5, & V10 ONLY**

*Corn only*

Find out if practices, such as mowing, burning, tilling, and chopping of field edges, lanes or roadways, were used to slow or control the spreading of pests into the field.

**Item 14e Water Management**

**V2, V5, & V10 ONLY**

*Corn only*

Find out if water management practices were used to control pests in this field. Water management practices include irrigation scheduling, drainage control, and other such water management practices.

**Item 14f      Cleaning of Equipment**  
**V2, V5, & V10 ONLY**  
*Corn only*

Find out if cleaning the harvesting and/or tillage equipment was used to reduce the spread of pests to or from the selected field.

**Item 15      Pest Control Procedures**  
**V6, V7, V8, V9, & V10**  
*Soybeans, Cotton, Wheat, Potatoes only*

The series of Items 15a-c asks if the operator used a variety of procedures and practices for the purpose of controlling pests on the selected field. If the procedure was used for this purpose, enter code 1 for YES. If the procedure was not used for the purpose of controlling pests, then enter a dash for NO and continue with the next item.

In some cases, the operator may have used a particular procedure, but not for the purpose of controlling pests. If this is the case, probe to verify that the operator's purpose was other than to control pests, by saying, for example, "Did you do that to control pests?" If the purpose for procedure was not for controlling pests, then the answer to the question is NO and a dashed entry should be made.

**Item 15a      Planting or harvesting date**  
**V6, V7, V8, V9, & V10**  
*Soybeans, Cotton, Wheat, Potatoes only*

Find out if the planting or harvesting date was adjusted in this field for the purpose of controlling pests.

**Item 15b      Alternate pesticides**  
**V6, V7, V8, V9, & V10**  
*Soybeans, Cotton, Wheat, Potatoes only*

Find out if the pesticide products were alternated in this field **from year to year** for the purpose of slowing the development of pest resistance. To alternate pesticides means to use products from different pesticide families.

**Item 15c**                      **Grazing date**  
**V7 & V10 ONLY**  
*Wheat only*

Find out if the grazing date was adjusted in the selected wheat field for the purpose of controlling pests.

**Item 16a**                      **Biological soil analysis**  
**V2, V5, V6, V7, V8, V9, & V10**  
*Corn, Soybeans, Wheat, Cotton, Potatoes*

Soil samples may be analyzed for the presence of insects, diseases, nematodes or other soil pests. Determine if the operator had such a biological soil analysis done for the selected field.

**Item 16b**                      **Consider beneficial insects**  
**V2, V5, V6, V7, V8, V9, & V10**  
*Corn, Soybeans, Wheat, Cotton, Potatoes*

Some producers will try to protect the beneficial organisms which occur naturally in their fields. Find out if the operator considered this in the selection and use of pesticides on this field.

Beneficial organisms are predators and parasites and other **natural** enemies of crop pests. Naturally occurring insect predators of mites, aphids and caterpillars in corn and soybeans include predatory mites, aphid predators, green lacewings, and lady beetles.

**Item 16c**                      **Remove weeds**  
**V2, V5, & V10 ONLY**  
*Corn only*

Find out if the operator removed “host” weeds (the weeds used by certain insects in their reproduction cycle) in insect infested areas in order to prevent insect egg laying in the selected corn field.

**Item 16d                      Seed treatments**  
**V2, V5, & V10 ONLY**  
*Corn only*

Find out if the operator used seed treatments for seedling blight control on this field. If seed treatments on purchased seed included treatment for seedling blight control, then enter code 1=YES. This includes purchased seed that had been treated with Captan.

**Item 16e                      Lab diagnosis**  
**V2, V5, & V10 ONLY**  
*Corn only*

Find out if the operator submitted diseased plants from the selected field to a lab for diagnosis.

**Item 17a                      Purchase & release beneficial insects**  
**V2, V5, V6, V7, V8, V9, & V10**  
*Corn, Soybean, Wheat, Cotton, Potatoes*

Find out if the operator purchased and released any beneficial species of insects on this field.

Beneficial organisms are predators and parasites and other natural enemies of crop pests. Some kinds can be purchased by operators and used on their fields. An example of a beneficial organism that is used on corn pests is the *Trichogramma* wasp, which is a very tiny parasite wasp that kills pests by laying eggs inside the pest's eggs.

**Item 17b                      Pheromones to monitor black cutworm**  
**V2, V5, & V10**  
*Corn only*

Producers may use pheromones [pronounced *fair-eh-moans*] in their effort to control insects. Pheromones are substances, such as sex hormones, that induce one or more reactions in an organism of the same species. Pheromones may be used to monitor insects counts by trapping, and to control insects by disrupting mating.

For black cutworms, a trap with a pheromone lure is used for early warning and monitoring population levels. Find out if the operator used pheromone lures to monitor for black cutworm on the selected corn field. Include use of traps.

**Item 17c                      Wireworm traps**  
**V2, V5, & V10 ONLY**  
*Corn only*

Find out if the operator used pre-plant grain traps for wireworms on this field. Pre-plant wireworm traps are small holes that are dug in the field several weeks prior to planting, filled with wireworm bait (untreated corn and wheat seed), and covered with loose soil and plastic. A few days before planting, the number of wireworms in these traps are counted to determine the need for control.

**Item 17d(1) & 17d(2)              Pheromones**  
**V6, V7, V8, V9, & V10**  
*Soybean, Wheat, Cotton, Potatoes*

Producers may use pheromones [pronounced *fair-eh-moans*] in their effort to control insects. Pheromones are substances, such as sex hormones, that induce one or more reactions in an organism of the same species. The two major ways pheromones are used in agriculture are to monitor insect populations by trapping and to control insects by disrupting mating.

In Item 17d(1), find out if the operator used pheromone traps and lures on the selected field to monitor pests. In Item 17d(2), find out if the operator used pheromones mating disruption systems to control pests.

**Item 18                      Biological pest control costs**  
**V2 ONLY**  
*Corn Production Practices & Costs only*

Record the TOTAL materials and custom application costs for all biological pest controls, including pheromones, pheromone traps, beneficial insects, and floral lures, attractants or repellants applied on this field for the 1996 corn crop. Exclude Bt corn seed.

Record in either dollars per acre or total dollars. Include any costs paid by the landlord.

Biological methods include beneficial organisms (pest predators and parasites) that are used to control crop pests, biochemical agents such as pheromones, microbial organisms such as *Bacillus thuringiensis* (Bt) and other bacteria, viruses, fungi, and protozoa.

**Item 19      Pest management information sources**

Have the respondent select the primary outside source of information on insect, weed and disease management recommendations for the 1996 crop grown in this field. Use the Respondent Booklet and show the operator the Pest Management Information Sources Code List. If the operator answers using the code rather than the words, verify the code by reading the associated category. For example, if the operator tells you code 2, verify that it means that the operator got pest control recommendations from a farm supply or chemical dealer.

If the operator used more than one source, probe to find out which ONE the operator considered the most important information source for helping control pests on the selected field in 1996.

The codes for Pest Management Information Sources are:

**Code 1- EXTENSION ADVISOR, PUBLICATIONS OR DEMONSTRATIONS (County, Cooperative or University).** Many state extension services publish detailed bulletins on local pest densities and other pest management information on a regular basis as well as annual or periodic pest management reports, and conduct regular demonstrations on new technology.

**Code 2- FARM SUPPLY OR CHEMICAL DEALER.** Many farm supply or chemical dealers offer scouting and other pest management services to the farmers that buy inputs from them.

**Code 3- COMMERCIAL SCOUTING SERVICE.** Some consulting firms provide services that are focused exclusively on pest management. These firms will offer scouting services, and may offer other insect, weed, and/or disease management services.

**Code 4- CROP CONSULTANT OR PEST CONTROL ADVISOR.** In 1994, there were over 400 crop consulting firms located in over 36 states in the U.S. operating independently from chemical companies and other farm input suppliers. A wide variety of services are offered by these firms, including insect, weed, and disease management.

**Code 5 - OTHER GROWERS OR PRODUCERS.**

**Code 6- PRODUCER ASSOCIATIONS, NEWSLETTERS OR TRADE MAGAZINES.** Farmer cooperatives and other producer associations sometimes provide pest management assistance, and many trade magazines offer pest management information, guidelines, and advice.

**Code 7 - TELEVISION OR RADIO PROGRAMS, NEWSPAPERS.**

**Code 8- ELECTRONIC INFORMATION SERVICES (*World Wide Web, DTN, etc*):** Information may be obtained electronically using computers. Using the Internet, producers can access the World Wide Web and obtain pest management information from a wide variety of sources. This is like a combination of a communication system and an electronic library.

DTN stands for Data Transmission Network. This is an example of an on-line market information service or market news service that provides market and other agricultural information through a data line, satellite dish, and a “dumb” terminal, which cannot be programmed to carry out computerized functions.

Code 9 - OTHER: An outside source of information other than those already listed. If the operator didn't use an outside source of information, instead relaying on experience or personal judgment, etc., use Code 10 for NONE.

Code 10 - NONE: No outside source of information was used. Use this code if the operator didn't use any other source of information for pest control decisions, besides experience or personal judgment, etc.

**Item 20      Pest identification and management training**

**V2, V5, & V10 ONLY**

*Corn only*

Determine if operator has attended a short course, workshop, or other training session on pest identification and management sponsored by universities or the Extension Service since October 1, 1995. Do not include seminars put on by chemical dealers.

**Item 21      Certified applicator**

**V2, V5, V6, V7, V8, V9, & V10**

*Corn, Soybean, Wheat, Cotton, Potatoes*

Determine if operator has completed necessary training to receive certification for applying “Restricted Use” pesticides.

**NOTES**

## **SECTION H - FIELD OPERATIONS, LABOR, AND CUSTOM SERVICES** Version 2: Corn Production Practices & Costs Report

## **SECTION H - FIELD OPERATIONS AND CUSTOM SERVICES** Version 3: Flue-Cured Tobacco Production Practices & Costs Report

## **SECTION H - FIELD OPERATIONS** Versions 5, 6, 7, 8, 9, & 10: Crop Production Practices Reports

### **What's this Section for? How is the information used?**

In Section H of *Versions 2 and 3* the operator is asked to list all the tractors used on the selected field and then **all** the operations performed on that field to raise the commodity of interest (corn or flue-cured tobacco), including fertilizer and pesticide applications. The **costs** of custom operations (other than those already collected in earlier sections) are also collected in this section. In addition, in *Version 2 CORN*, labor hours are obtained, aside from hours spent operating machines.

Section H of *Versions 5, 6, 7, and 10* obtains all the operations performed on the selected field up to and including planting the target commodity (corn, soybeans, or wheat), including tillage but excluding fertilizer and pesticide applications. Limited tillage data are collected for cotton in *Versions 8 and 10*. No tillage data are collected for potatoes in *Versions 9 and 10*.

Equipment used for custom operations are enumerated in all versions.

Machinery information is used to identify tillage systems and residue levels. This allows examination of the impact of the conservation compliance provisions of the recent Farm Bills on tillage systems, cropping practices, and crop residue levels.

The machines listed in the Field Operations Table are also used in conjunction with tractors listed in the Tractors Table to determine costs of various field operations. Agricultural engineers have studied the relationships between tractor size and type of field operation to determine the costs of field work. Cost of production budget items estimated using data from the Tractors and Field Operations Tables include fuel, repairs, taxes and insurance.

In addition, engineering formulas are used to compute how much of the physical capital (machines and equipment) is "used up" while performing the field operations on each of the commodities of interest (corn or flue-cured tobacco). By itemizing the tractors and equipment, the amount of capital invested in machinery is estimated using the prices of equipment and machines. These estimates are used in the cost of production budgets in assigning annual costs for "capital replacement" and "other non-land capital."

Operators do not pay this amount each year, but when they purchase machinery, they amortize the cost over the life of the machine. ERS estimates a capital replacement and other nonland capital cost based on the total value of the machinery.

Costs for custom and technical services used on the selected field are also collected in this section in *Versions 2 and 3*. These items are used to estimate the costs of the operator hiring out certain farming operations. Usually the custom provider supplies all the equipment and labor for performing the custom operation. A good example is hiring some firm to come in and harvest the crop, a common operation with small grains in the Great Plains. In the cost of production budgets, the cost of custom operations is listed as a single cost. Since custom operations are enumerated along with other field operations in the Field Operations Table, costs need to be obtained for those operations. Landlords' contributions to these expenses are also collected since landlords frequently pay part of these expenses.

**Item 1        TRACTORS TABLE**  
**V2 & V3 ONLY**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

Include tractors that were owned, rented, leased or borrowed by the operation and used on **the selected field only**. Tractors owned in partnership should also be included if they were used on the selected field. Don't count tractors used by custom operators. Also don't count tractors owned by the operation which were **ONLY** used for custom work, **ONLY** used for other commodities or **ONLY** used on other operations. Don't list the same tractor on more than one line.

If more than the available number of lines are needed, use a TRUCKS AND TRACTORS SUPPLEMENT. Copy the identification as it appears on the main questionnaire to the identification box on the supplement. The line numbering on the SUPPLEMENT picks up with line number 7 and continues through number 11. If you find more than 11 tractors used on the selected field, continue recording the tractors with line number 12, and make good notes for the Office.

The line number is used to identify tractors used for the field activities recorded in Item 2.

**TRACTORS        Make and model**  
**Column 2**

List the make and model for each tractor used on the selected field, such as John Deere 4050. Since PTO horsepower may need to be verified in the office, the make and model are important items.

List all tractors which were used on the selected field for the 1996 crop, not just those actually used in 1996. In some cases this will involve recording a tractor which was not used on the selected field at all for the crop in 1996. This can happen because some of the fieldwork for the crop was done in the fall of 1995.

**TRACTORS        Model year**  
**Column 3**

List the model year for each tractor recorded in column 2, using the last two digits. For example, if the model year is 1990, enter 90.

**TRACTORS**            **Drive**  
**Column 4**

Enter the code for the type of drive for the tractor listed in column 2:

- Code 2 - 2-WHEEL DRIVE
- Code 3 - 2-WHEEL DRIVE WITH FRONT WHEEL ASSIST
- Code 4 - 4-WHEEL DRIVE
- Code 5 - CRAWLER
- Code 6 - OTHER

**TRACTORS**            **PTO HP**  
**Column 5**

Record the power take-off (PTO) horsepower rating. If the operator is not sure of the PTO rating, get a best estimate and write a note in the margin. Be sure the make and model are correctly listed so the PTO horsepower can be looked up in the state office.

**TRACTORS**            **Fuel type**  
**Column 6**

Enter the code for the type of fuel the tractor used:

- Code 1 - DIESEL
- Code 2 - GASOLINE
- Code 3 - LP GAS (liquefied petroleum or propane)
- Code 9 - OTHER

In many states, products sold as gasoline contain ethanol. For the purposes of this survey, if the product is sold as gasoline or gasohol, record it as gasoline (code 2). If the fuel used for the tractor is ethanol or mostly ethanol, use code 9.

**General Instructions for Field Operations and Equipment**

- Item 2: *V5, V6, V7, & V10*
- Item 3: *V2*
- Item 4: *V3*

How you administer the Field Operations Table differs somewhat between questionnaire versions. We have attempted to minimize these differences. However, you will need to be aware of the differences and be alert to them when you use different versions as you move from one interview to another.

There are three main reasons for the differences between versions. 1) The primary users of the Field Operations Table in the Crop Production Practices Reports have different data needs than do the primary users of the Field Operations Table in the Production Practices and Costs Reports. 2) Both sets of users will be using the data from *Version 2* CORN PRODUCTION PRACTICES AND COSTS, so the different needs of both groups must be met with a single structure for this version. 3) If certain information is not needed on a particular version to satisfy the data users, then we do not want to burden the farm operator by asking for information or for detail that will not be used by one set of data users or the other. To the extent possible, we have attempted to minimize the burden and time spent with farm operators while taking into consideration the needs and uses of the data. However, this has resulted in additional burden being placed on you, the enumerators, because we're asking you to keep track of the differences in collecting field operations on the different versions.

This manual is organized to start with instructions for collecting Field Operations on the Crop Production Practices Reports, *Versions 5, 6, 7, & 10*. These versions have the minimum requirements.

Then instructions for *Version 2* CORN PRODUCTION PRACTICES AND COSTS will describe what to collect in addition to the requirements of the Crop Production Practices Reports.

Instructions for *Version 3* FLUE-CURED TOBACCO PRODUCTION PRACTICES AND COSTS will describe differences and exceptions for collecting Field Operations for flue-cured tobacco.

On the following page is a table summarizing the differences among the various questionnaire versions. Details will be provided in the instructions for Items 2 for *Versions 5, 6, 7, & 10*, in Item 3 for *Version 2*, and in Item 4 for *Version 3*. Following that, instructions will be given on how to complete each column of the Field Operations Table, noting the appropriate version.

**EXHIBIT**  
**SUMMARY OF PROCEDURES FOR COMPLETING THE FIELD OPERATIONS TABLE**  
**IN EACH QUESTIONNAIRE VERSION**

INSTRUCTION	VERSION AND ITEM NUMBER		
	<i>V5, V6, V7, &amp; V10 CORN, SOYBEANS, &amp; WHEAT Item 2</i>	<i>V2 CORN PRODUCTION PRACTICES AND COSTS Item 3</i>	<i>V3 FLUE-CURED TOBACCO PRODUCTION PRACTICES AND COSTS Item 4</i>
Record operations beginning after harvest of previous crop, and <b>END</b> with the current crop's --	PLANTING	HARVEST and HAULING FROM THE FIELD	HARVEST and HAULING FROM THE FIELD
Necessary to maintain the <b>SEQUENCE</b> of individual operations?	YES	YES	NO
Multiple passes using the <b>same equipment</b> can be recorded on the <b>same line</b> ?	NO	NO	YES
How to record tandem implements?	Retain the same SEQUENCE NUMBER in Column 2.	Retain the same SEQUENCE NUMBER in Column 2 <b>AND</b> , in Column 9, enter the cell code of the Column 9 cell containing the Item 1 line number of the tractor pulling the implements.	In Column 9, enter the cell code of the Column 9 cell containing the Item 1 line number of the tractor pulling the implements.
<b>INCLUDE fertilizer and pesticide</b> implements?	NO	YES	YES
<b>INCLUDE</b> machines used by <b>custom operations</b> ?	YES	YES	YES
Columns to complete:	1 ( <i>V10</i> only), 2, 3, 4, 6, 10, 11, & 14	2, 3, 4, 5, 7, 8, 9, 10, 11, & 13	3, 4, 6, 7, 8, 9, & 12

**Item 2      Field Operations**

**V5, V6, V7, & V10**

*Corn, Soybeans, & Wheat only*

Record the tillage implements in the order used to prepare the selected field for planting. If a crop was produced on this field in 1995, record all tillage operations since the harvest of the 1995 crop. If this field was in fallow (idle, diverted) in 1995, record all tillage operations starting with the fall of 1994.

The best way to get the information in this item is to ask the operator to describe all of the field work done for the target commodity after harvesting the crop(s) previously grown on the selected field. Start by asking what happened after harvest of the preceding crop and then keep going in the order that the operations were performed, up to and including planting the target commodity on this field.

**EXCLUDE** trips over the field or implements used only to apply fertilizer or pesticides and implements used for the application of lime. However, if fertilizer was applied by an attachment to a tillage implement, be sure to record the tillage implement. Also, if preplant herbicides were applied and then disked in, record the disk.

In sequential order, enter the trips over the field beginning with the first tillage operation since harvest of the last crop. End with (AND INCLUDE) the drill or other implement used to plant this crop. The sequence of operations and implements must be maintained, because it is very important for determining residue levels.

If the operator uses two or more different cropping practices on the selected corn field (for example, irrigated and non-irrigated acres) and these have different field operations, be sure to enumerate operations for each of the cropping practices. Record each tillage operation in sequence, entering the number of acres in Column 10 for which each practice was applied.

**Important:** One of the last machine entries should be the planter used to plant the current target commodity. The planters are listed in the Respondent Booklet, along with most other implements commonly used in tillage operations.

You will record the order of the machine operations by entering SEQUENCE NUMBERS in Column 2. Sometimes the respondent forgets to report an operation in its right order. When this happens, just add the forgotten operation wherever you are in the table when it is reported, and enter its correct SEQUENCE NUMBER. Then go back and change the numbers you previously entered to reflect the correct order of machine operations. **BESURE** to correct all SEQUENCE NUMBERS that are affected. This is much simpler than erasing and re-entering in the correct order all the operations you had already recorded in Column 3.

The cell numbers do not have to be changed to correspond to the corrected order, only the SEQUENCE NUMBER entered in Column 2.

In summary, list the operations in the order they occurred AND maintain the order of tandem hook-ups. Enter the SEQUENCE NUMBER of each operation in the order it occurred. List the tillage and planting implements used on this field beginning with the first trip over the field after harvest of the preceding crop and continuing through seeding this year's crop. If this field was fallow (idle, diverted) during 1995, list operations starting with the fall of 1994. **Include** plowing, corrugation, land preparation, and planting. **Include** custom operations. **Exclude** fertilizer and pesticides implements. **Exclude** the application of lime.

### Item 3      Field Operations

#### **V2 ONLY**

#### *Corn Production Practices & Costs only*

List ALL of the field work performed by machines on the selected field for the 1996 CORN crop. The best way to get the information in this item is to ask the operator to describe all of the field work done on the selected field after harvesting the crop(s) previously grown on this field. Start by asking what happened after harvest of the preceding crop. This will probably consist of a stalk shredding or a tillage operation depending upon the previous crop. This may have been performed any time from fall of 1994 through spring of 1996, depending upon cropping practices. Then continue listing the operations in the order they were performed, all the way through harvest and hauling of the CORN crop from this field.

This item is the same as Item 2 on *V5, V6, V7, and V10*, in two ways: 1) SEQUENCE of the operations must be maintained. 2) Continue to INCLUDE custom field operations.

This item differs from Item 2 on *V5, V6, V7, and V10*, in two ways: 1) Continue enumeration of field operations up to and including harvest and hauling the crop from the selected field. 2) Include ALL fertilizer and pesticide implements used on the selected field to produce the 1996 corn crop.

Field operations for fertilizer and chemical applications should agree with those reported earlier in Section E: FERTILIZER and Section F: CHEMICALS and PESTICIDES. For example, each fertilizer or pesticide application reported in the Fertilizer Table or in the Pesticide Table should show up here in the Field Operations Table, unless it was applied through the irrigation water (in this case make a note). Fertilizers or pesticides listed as custom applied should also appear in this section. It may help to finish this section if you ask the operator what operations, if any, were missed.

The machine code listings in the Respondent Booklet show most of the machines commonly used in field operations. Let the respondent report the codes of the machines used. It will help you to get better data if you're using a copy of the Respondent Booklet, too.

**NOTE:** Include field operations done by neighbors, friends, etc. on a "swap" basis. If these people use their own tractors, the tractors should be recorded in Item 1 in this section.

If the operator uses two or more different cropping practices on the selected corn field (for example, irrigated and non-irrigated acres) and these have different field operations, be sure to enumerate operations for each of the cropping practices. Record each operation in sequence, entering the number of acres in Column 10 for which each practice was applied.

If any of the CORN acres in the selected field were abandoned, all of the field work done on these acres until they were plowed under or cut should be included. Exclude the activity of plowing these acres under. If the operator re-seeded acres to CORN, include all operations. Except where CORN was replanted, exclude any field work done to prepare the field for another crop. Also exclude planting a replacement crop other than CORN.

In summary, list all of the field work performed by machines on the selected field to produce the 1996 CORN crop. Begin with the first operation performed after harvest of the preceding crop, and continue listing operations through harvesting the CORN crop and hauling it out of the field (if carts or wagons were used). List the operations in the order they occurred AND maintain the order of tandem hook-ups. Enter the SEQUENCE NUMBER of each operation in the order it occurred. Include fertilizer and pesticides implements. Include custom operations. Exclude the application of lime.

#### **Item 4      Field Operations**

##### **V3 ONLY**

##### *Flue-Cured Tobacco Production Practices & Costs only*

List ALL of the field work performed by machines on the selected field for the 1996 FLUE-CURED TOBACCO crop. The best way to get the information in this item is to ask the operator to describe all of the field work done on the selected field after harvesting the crop(s) previously grown on this field. Start by asking what happened after harvest of the preceding crop. This will probably consist of a stalk shredding or a tillage operation depending upon the previous crop. This may have been performed any time from fall of 1994 through spring of 1996, depending upon cropping practices. Then continue listing the operations in the order they were performed, all the way through harvest and hauling of the FLUE-CURED TOBACCO crop from this field.

This item is the same as Item 3 on V2 in three ways: 1) Enumerate field operations beginning with the first operation after harvest of the previous crop from the selected

field and continue up to and including harvest and hauling the crop from that field. 2) Include ALL fertilizer and pesticide implements used on the selected field to produce the 1996 FLUE-CURED TOBACCO crop. 3) INCLUDE custom field operations.

This item differs from Item 3 on V2 in two ways: 1) SEQUENCE of the operations need not be maintained. 2) Operations repeated on the selected field using the same equipment can be recorded on a single line, adding together the acres covered each time.

Sometimes the respondent forgets to report an operation in its right order. When this happens, just add the forgotten operation wherever you are in the table when it is reported, and draw an arrow in the margin showing where it should have been. If the operator repeated an operation, acres may be added together as long as the tractor, and machine are the same.

When the operator reports an operation identical to one already listed (same machine and tractor), you can go back to the line where it was originally listed and add the additional acres.

If the machine and tractor are not the same as the ones already listed, the operation has to be listed separately. If possible, identical field operations should be combined and entered on one line, adding acres covered multiple times into the total acres (column 12) on which an operation was performed.

Field operations for fertilizer and chemical applications should agree with those reported earlier in Section E: FERTILIZER and Section F: CHEMICALS and PESTICIDES. For example, each fertilizer or pesticide application reported in the Fertilizer Table or in the Pesticide Table should show up here in the Field Operations Table, unless it was applied through the irrigation water (in this case make a note). Fertilizers or pesticides listed as custom applied should also appear in this section. It may help to finish this section if you ask the operator what operations, if any, were missed.

The machine code listings in the Respondent Booklet show most of the machines commonly used in field operations. Let the respondent report the codes of the machines used. It will help you to get better data if you're using a copy of the Respondent Booklet, too.

**NOTE:** Include field operations done by neighbors, friends, etc. on a "swap" basis. If these people use their own tractors, the tractors should be recorded in Item 1 in this section.

If the operator uses two or more different cropping practices on the selected flue-cured tobacco field (for example, irrigated and non-irrigated acres) and these have different field operations, it's easiest to start with the practice that has the most acres and complete the table for those acres. Then go to the next practice and complete the table for those acres.

If any of the FLUE-CURED TOBACCO acres in the selected field were abandoned, all of the field work done on these acres until they were plowed under or cut should be included. Exclude the activity of plowing these acres under. If the operator reset acres to FLUE-CURED TOBACCO, include all operations. Except where FLUE-CURED TOBACCO was replanted or reset, exclude any field work done to prepare the field for another crop. Also exclude planting a replacement crop other than FLUE-CURED TOBACCO.

In summary, list all of the field work performed by machines on the selected field to produce the 1996 FLUE-CURED TOBACCO crop. Begin with the first operation performed after harvest of the preceding crop, and continue listing operations through harvesting the FLUE-CURED TOBACCO crop and hauling it out of the field (if wagons were used for hauling). List the operations in the order they occurred AND maintain the order of tandem hook-ups. However, strict sequence of operations need not be maintained; identical operations using the same tractor and equipment may be recorded on a single line and the acres summed. Include fertilizer and pesticides implements. Include custom operations. Exclude the application of lime.

**FIELD OPERATIONS      Commodity Code**

**Column 1**

**V10 ONLY**

*Corn, Soybeans, & Wheat only*

Enter the commodity code for each selected field as you enumerate the tillage and planting operations for that target commodity. The Field Operations Table is completed only for the following target commodities:

Code 1 - CORN

Code 2 - SOYBEANS

Code 4 - WINTER WHEAT

Code 5 - DURUM WHEAT

Code 6 - (OTHER) SPRING WHEAT

When the tillage and planting operations are completely enumerated for the selected *[commodity 1]* field, proceed to list the tillage and planting operations for the selected *[commodity 2]* field. When you begin to list the operations for the *[commodity 2]* field, start over numbering the operation SEQUENCE with "1" in Column 2.

**FIELD OPERATIONS      Sequence number**

**Column 2**

**V2, V5, V6, V7, & V10**

*Corn, Soybeans, & Wheat only*

Correct sequence of the operations over the selected field must be maintained. Enter the SEQUENCE NUMBER of each operation, beginning with number "1" for the first operation after harvest of the previous crop. In *Version 10*. Multi-crop, after completely enumerating the tillage and planting operations for the selected *[commodity 1]* field, start over with number "1" when you begin to list the operations for the *[commodity 2]* field.

Implements in tandem hook-ups should be entered on their own lines. For a tandem or multiple hookup of individual tillage implements, record the first implement of the set in Column 3 and its implement code in Column 4. When you record the second implement on the next line, keep the same SEQUENCE NUMBER in Column 2 that was entered for the first implement in the set. If more than two implements are in such a set, list them in the appropriate hookup order, each one on its own line, and record the same SEQUENCE NUMBER for all the implements in that same set.

For example, you've just enumerated the first 2 operations on the selected CORN field. Then for the third operation, the operator tells you that he used a spike tooth harrow connected to a regular tandem disk. After this operation, the respondent reported that he planted. You would record this as follows:

<b>2</b> Sequence Number	<b>3</b> Operation or Equipment	<b>4</b> Machinery Code
1	regular moldboard plow	5
2	regular tandem disk	15
3	regular tandem disk	15
3	spike tooth harrow	38
4	planter	114

Sometimes the respondent forgets to report an operation in its right order. When this happens, just add the forgotten operation wherever you are in the table when it is remembered, and enter its correct SEQUENCE NUMBER. Then go back and change the numbers you previously entered to reflect the correct order of machine operations. BE SURE to correct all SEQUENCE NUMBERS that are affected. This is much simpler than erasing and re-entering in the correct order all the operations you had already recorded in Column 3.

The cell numbers do not have to be changed to correspond to the corrected order, only the SEQUENCE NUMBER entered in Column 2.

For example, you have entered operations 1, 2, 3, 4, 5, and 6, when the operator recalls an implement that followed the operation you have entered as Number 3. Correct the SEQUENCE NUMBERS and continue recording operations in order as follows:

1  
2  
3  
~~4~~ 5  
~~5~~ 6  
~~6~~ 7  
4  
8  
9  
etc.

#### **FIELD OPERATIONS      Implements Used**

##### **Column 3**

**V2, V3, V5, V6, V7, & V10**

*Corn, Soybeans, Wheat, & Flue-Cured Tobacco*

Record either the operation or the equipment the operator reports using, such as a plow, disk, harrow, planter, etc. In *V2* and *V3* continue recording operations or equipment used following planting, such as a cultivator, combine, wagon or cart, etc. If the operator reports using a machine for which a code is not available, ask the operator which one of the implements in the Respondent Booklet best describes it, or describe the machine as completely as possible in notes.

Enter the name of each implement used on a separate line. Each line entry should indicate one complete pass over the field. Obtaining the total number of passes over a field is an important factor in estimating cost differences between tillage systems.

Record operations in the order that they were performed. Try not to leave blank lines due to limited line space. For *V5*, *V6*, *V7*, and *V10*, the last entry will always be the planting operation. For *V2* and *V3* the last entries should be equipment used for harvesting and hauling (if carts or wagons were used) the corn or flue-cured tobacco from the field.

Record each implement that was used on the field. If an implement was used on only a part of the field, the number of acres it covered will be obtained in Column 11. On some large acreages, two (or more) tractor-implement sets (for example, two tractors and plows) may have been used at the

same time to perform an operation. Record each tractor-implement combination on separate lines and obtain the acres covered by each one in Column 11.

Enter the name of implement for custom operations, and enter the implement code in Column 4.

In *V2* and *V3* hauling the crop out of the field to storage facilities in grain carts or other wagons should be included. For hauling operations, the size recorded in Column 7 should be in pounds, bushels, or tons, with the appropriate unit code entered in Column 8. Include only hauling done with tractors. For flue-cured tobacco, include hauling with frames pulled by tractors. Depending on the crop, include hauling by tractors to barns, curing barns, grain bins, dryers or cleaners. Include hauling the crop with tractors to market directly from the field only. Exclude hauling to market from storage at a later date. Do not include any hauling done with trucks. Trucks should be listed in SECTION K, VEHICLES AND TRUCKS. Recording their use in this section would duplicate information provided there.

**Important:** If more operations were completed on the selected field than there are lines available on the questionnaire, use a FIELD OPERATIONS SUPPLEMENT. Copy the identification as it appears on the main questionnaire to the identification box on the supplement. Continue enumerating operations (numbered in sequential order on *V2*, *V5*, *V6*, *V7*, and *V10*) on the SUPPLEMENT.

**FIELD OPERATIONS      Implement Code**

**Column 4**

***V2, V3, V5, V6, V7, & V10***

*Corn, Soybeans, Wheat, & Flue-Cured Tobacco*

For each operation SEQUENCE NUMBER in column 2, record the appropriate implement in column 3 and the appropriate code in column 4. The codes are listed in the Respondent Booklet to be used during the interview. If the implement is not listed in the Respondent Booklet, write a description of that implement in notes on the questionnaire. Probe to see if any names in the Respondent Booklet may be applicable.

For a tandem or multiple hookup of individual implements, record each implement of the set in separate lines and enter the appropriate implement code in Column 4. Maintain the order of tandem hook-ups. Retain the same SEQUENCE NUMBER in Column 2. Follow the instructions for recording TANDEM FIELD OPERATIONS at the end of instructions for Items 2, 3, and 4.

Do not consider as a tandem or multiple hookup the attachment of two implements of the same type (for example, two plows hooked side-by-side) for the purpose of allowing wider coverage with one pass over the field. Treat this as one implement.

Implements that have several tillage components attached to a single frame should not be recorded as a tandem or multiple hookup. For example, a "do-all" is a single implement that has disk blades, field cultivator shanks, and some type of harrow mounted on a single frame. Enter the appropriate code for the single implement from the Machinery Code List in the Respondent Booklet. If there is no appropriate code on the Machinery Code List, describe the implement in notes.

Only one code should be entered in Column 4, for example, enter code 5 for a moldboard plow.

If an implement is not included in the Machinery Code List in the Respondent Booklet, enter the implement name on the appropriate line in Column 3, and briefly describe the implement in notes. Be as complete as possible in your description. The equipment will have to be coded in the State office based solely on the specified name and description that record.

PROBE for the specific type of implement so that it can be coded correctly (for example, plow = regular chisel plow, disk = tandem disk, harrow or drag = spike tooth harrow).

## **FIELD OPERATIONS      Worker Performing Operation**

### **Column 5**

### **V2 ONLY**

*Corn Production Practices & Costs only*

Enter the code of the type of worker that performed the operation recorded in Column 3, operating the machine or equipment recorded in 4. This information will be used, along with the acres per hour and acres covered recorded in Column 10 and 11, to determine the labor usage on the field by type of worker. This method of collecting labor within the Field Operations Table saves us from having to count these hours again in a separate Labor Section.

The types of workers are:

- Code 1 - YOU (THE OPERATOR)
- Code 2 - PARTNER
- Code 3 - UNPAID WORKER
- Code 4 - PAID PART-TIME or SEASONAL WORKER
- Code 5 - PAID FULL-TIME WORKER
- Code 6 - CUSTOM APPLICATOR

These codes are also listed in the Respondent Booklet under the heading MACHINE OPERATOR LABOR CODES. They appear on the facing pages containing the MACHINERY and IMPLEMENT

**CODES.** Point this out to the respondent to refer to easily as you complete the Field Operations Table.

Include family members in the appropriate category, depending on whether they were UNPAID, PAID PART-TIME or SEASONAL, or PAID FULL-TIME. For example, if the operator's daughter operated the piece of equipment listed in Column 4 for operation sequence number 7, and she is considered a PAID PART-TIME worker on the operation, then enter code 4 on line 7.

If more than one worker was used to conduct the field operation, report the type of worker that actually operated the machine recorded in Column 4, such as the tractor/truck driver. The labor hours for the other workers will be obtained in Item 8, Column 6, LABOR hours for work other than operating machines. If two people alternated performing a single field operation, record the code for the person who operated the machine over the most acres.

For operations conducted by CUSTOM APPLICATORS, with Code 6 entered in Column 5, go to Column 13. Columns 7, 8, 9, 10, and 11 should not be completed for custom operations.

**FIELD OPERATIONS      Custom operation**

**Column 6**

**V3, V5, V6, V7, & V10**

*Corn, Soybeans, Wheat only*

*Flue-Cured Tobacco Production Practices & Costs only*

Determine if the operation recorded in Column 3 was a custom operation. If YES, enter code 1 and go to Column 14 on V5, V6, V7, or V10, **OR** go to the next line and continue with the next operation for V3 FLUE-CURED TOBACCO. If the operation is **not** a CUSTOM operation, continue with Column 10 on V5, V6, V7, or V10, **OR** Column 7 on V3 FLUE-CURED TOBACCO.

**FIELD OPERATIONS      Size of Machine**

**Columns 7 & 8**

**V2 & V3 ONLY**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

Enter the width of the area covered by the equipment on a single pass over the field. **Size means the swath covered by the machine, not necessarily how wide the equipment is.** For instance, a broadcast fertilizer spreader may be only 6 feet wide, but it can spread fertilizer over a swath of 30-40 feet. In this case, 35 feet would be the right entry.

**FIELD OPERATIONS      Unit code for machine size**  
**Column 8**  
**V2 & V3 ONLY**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

Enter the code for the unit of width associated with the swath size recorded in Column 7. The unit codes for width are:

- Code 1 - FEET
- Code 2 - ROW
- Code 3 - MOLDBOARD (bottoms)

For example, if a 4-bottom moldboard plow was used, record "4" as the equipment size in Column 7 and enter code "3" in Column 8.

Unit codes for hauling operations are:

- Code 4 - POUNDS
- Code 5 - BUSHELS
- Code 6 - TONS

Unit codes 4, 5, and 6 should only be used for operations hauling corn or flue-cured tobacco from the field in carts or wagons pulled by a tractor.

**FIELD OPERATIONS      Line number of tractor used**  
**Column 9**  
**V2 & V3 ONLY**

*C & Flue-Cured Tobacco Production Practices & Costs*

Enter the line number of the tractor (lines 1 through 6 of Item 1) that was used to pull the equipment. If the equipment was self-propelled, enter code 99. If two tractors were used simultaneously to pull one piece of equipment, identify both tractors and write a note at the bottom of the page. If horses, mules or other draft animals were used to pull the equipment, enter code 66. If it was pulled by a pick-up, enter code 77. If a truck other than a pick-up was used to pull the piece of equipment, enter code 88.

For a tandem or multiple hookup of individual implements, record the first implement of the set in Column 3 and its machinery code in Column 4. Along with other data in this line, complete Column

9 identifying the Item 1 line number of the tractor used. Then record the second implement on the next line, completing Columns 3 and 4. In Column 9 on this line, enter the **cell code** of the Column 9 cell containing the Item 1 line number of the tractor pulling the equipment. This will indicate which tractor provided the power to pull the tandem implements. If more than two implements are in such a set, list them in the appropriate hookup order, each one on its own line, and enter the **cell code** of the tractor identified as pulling the first implement in the set.

Complete instructions for recording tandem operations and an example of recording tandem operations on each questionnaire version follow the Column-by-Column instructions for the Field Operations Table.

**FIELD OPERATIONS      Number of acres covered**  
**Column 10**  
**V2, V5, V6, V7, & V10**  
*Corn, Soybeans, & Wheat only*

Record the number of acres covered for this operation on the selected field. Enter the number of acres covered on a single pass of the equipment over the field, not the total for multiple passes of the same equipment over the field. Multiple passes of the same equipment should be recorded on separate lines as separate operations in the correct sequence.

If only part of the field was covered, enter the number of acres in the part of the field covered. If more than one piece of equipment operated on the field at the same time, such as more than one combine doing harvesting, enter each piece of equipment on separate lines, along with the acres covered by each.

Record acres covered to the nearest TENTH of an acre.

For land forming equipment, Column 10 should be completed by recording the **total hours** that the equipment was used in production of the target commodity. These machines are used to make or close ditches, or to change the slope of the land, and the field acreage covered is not a good indicator of total machine use. Then leave Column 11 blank.

On Version 2: CORN, when recording information about equipment used in hauling operations, such as grain carts and wagons, Column 10 should be completed by recording the total hours that the hauling activity took for the selected field. Then leave Column 11 blank.

**FIELD OPERATIONS      Acres Covered Per Hour**  
**Column 11**  
**V2, V5, V6, V7, & V10**  
*Corn, Soybeans, & Wheat only*

Record the acres covered per hour for this operation on the selected field. Operators usually know this as the equipment speed. They usually know the speed at which the tractor used pulled the specific implement on a given field, saying something like "Well, this tractor pulling that piece of equipment on that land (or the type of land in that field, such as hills, flats, etc.) goes about X acres per hour."

If the operator does not know this precisely, obtain a best estimate. Ask how long this operation took on this field, then divide this total time into the number of acres in the field:

Acres Per Hour = (Total Acres in Field) ÷ (Total Hours to Complete Operation).

Record acres per hour to the nearest one-tenth.

If the respondent does not know how long an operation took, ask for an estimate of how long it would normally take (average situation) to do this operation on the selected field. Use this time estimate in the above formula.

If the respondent will not or cannot do this, leave Column 10 blank and write DK (for "don't know") in notes near the item cell.

If the need for this data is questioned, explain that this will be used along with the tractor information to compute per acre labor, machine, and fuel costs.

An alternative method of estimating acres per hour is possible if the operator knows the machine width in feet and the speed that was traveled. Then use the following formula:

Acres Per Hour = (Machine Width in Feet) x (Speed in MPH) ÷ 10.

**FIELD OPERATIONS      Total acres covered**

**Column 12**

**V3 ONLY**

*Flue-Cured Tobacco Production Practices & Costs only*

Record the total acres covered during all the times this machine was pulled by the tractor listed in Column 9. For example, if 30 acres were disked 3 times with the same disk and tractor, enter 90 acres in Column 12.

Acres covered by "slide" or "skip" rows should be included when recording activities, such as pre-plant tillage operations, that cover all the field acres. These "slide" or "skip" rows are unplanted areas that allow equipment to pass. If these acres are not covered by a particular operation, they should not be included.

Record total acres covered to the nearest TENTH of an acre.

For land forming equipment, Column 12 should be completed by recording the **total hours** that the equipment was used in production of the target commodity. These machines are used to make or close ditches, or to change the slope of the land, and the field acreage covered is not a good indicator of total machine use.

For equipment used in hauling operations, such as grain carts and wagons, Column 12 should be completed by recording the total hours that the hauling activity took for the selected field.

**FIELD OPERATIONS      Month Used**  
**Column 13**  
**V2 ONLY**  
*Corn Production Practices & Costs only*

Record the number of the month of the year when the implement was used. This is being asked in order to allow wind erosion to be considered in identifying the tillage system. Use the two digit MM format for recording the month number. For example, for operations completed in April, enter 4.

**FIELD OPERATIONS      Date of operation**  
**Column 14**  
**V5, V6, V7, & V10**  
*Corn, Soybeans, & Wheat only*

Record the date the tillage operation was performed on the selected field. If it took more than one day to do the operation, enter the date that most of the field acres were covered.

Some operators have records of when each operation was done on each field. Use these records if they are available. If the respondent does not remember when the operation was performed, use the CALENDAR showcard as a response aid. Since you circled the planting date on this showcard at the beginning of the interview, the respondent may be able to figure out the date of each operation by thinking about it relative to the planting date.

If the operator is not able to come up with the specific date when an operation was done, ask for the WEEK in which it was performed, using the CALENDAR showcard. Then enter the date of the WEDNESDAY of that week. For example, if the operator says that the field was plowed was done during the week of April 21-27, 1996, then record 4 24 96, which is the date of the WEDNESDAY of that week.

## **HOW TO RECORD TANDEM FIELD OPERATIONS**

Often farmers perform two or more field operations at the same time. A common example of this is a spike tooth harrow connected to a regular tandem disk, pulled by one tractor.

Equipment used for fertilizer and chemical applications included in the Field Operations Table in *Version 2* CORN or *Version 3* FLUE-CURED TOBACCO may also be commonly done as tandem operations with another operation. Each separate item of equipment must be identified in order to calculate costs or to identify the tillage system used on the field.

**Item 2      Field Operations - TANDEM OPERATIONS**  
**V5, V6, V7, & V10**  
*Corn, Soybeans, & Wheat only*

When a farmer reports a tandem field operation:

1. Record the first piece of equipment just like any single machine field operation. Record the SEQUENCE NUMBER in Column 2 in order from the previous operation. Enter the data for all remaining columns in that line.
2. On the next line, record the tandem operation in Column 3 and the machinery code of the second piece of equipment in Column 4. Record the same SEQUENCE NUMBER as the operation entered on the previous line. Skip Columns 6, 10, 11, and 14, and go to the next operation in sequence.
3. If more than two pieces of equipment were used in tandem, repeat step 2 for each additional piece of equipment.

Be sure each required column is completed for every piece of tillage and/or planting equipment used to prepare and plant the target commodity on the selected field.

Chapter 5  
Section H

**EXAMPLE:** The following example illustrates how tandem operations would be recorded in the FIELD OPERATIONS TABLE on *V5* CORN. Tandem operations would be recorded in the same manner on *V6*, *V7*, and *V10*.

[If column 6 is code 1  
(CUSTOM)  
skip columns 10 - 11.]

2 S E Q U E N C E N O.	3 What operation or equipment was used on this corn field?	4 [Record machine code from Respondent Booklet.]	6 Was this a custom operation? YES- Enter 1 and go to column 14. NO - Continue.	10 How many acres were covered? 1/  ACRES	11 What were the acres covered per hour?  ACRES PER	14 When was this operation done? [Show respondent CALENDAR showcard.]  MM DD YY
0369 1	Chisel Plow	0394 1	0441	0561 65.0	0586 4.0	0658 3 28 96
0370 2	Tandem Disk	0395 15	0442	0562 65.0	0587 7.5	0659 4 09 96
0371 2	Spring tooth harrow	0396 39	0443	0563	0588	0660 _ _ _ _ _
0372 3	Field Cultivator	0397 21	0444	0564 65.0	0589 8.0	0661 4 16 96

**Item 3      Field Operations - TANDEM OPERATIONS**

**V2 ONLY**

*Corn Production Practices & Costs only*

When a farmer reports a tandem field operation:

3.      Record the first piece of equipment just like any single machine field operation. Record the SEQUENCE NUMBER in Column 2 in order from the previous operation. Enter the data for all remaining columns in that line.
  
4.      On the next line, record the tandem operation in Column 3 and the machinery code of the second piece of equipment in Column 4. Record the same SEQUENCE NUMBER as the operation entered on the previous line. Skip Columns 5, 7, and 8.
  
5.      In Column 9, enter the **cell code** of the Column 9 cell containing the Item 1 line number of the tractor pulling the pieces. This is on the same line as the first machine in the tandem sequence. Entering the cell code number will indicate which tractor is providing the power for both implements. Skip Columns 10, 11, and 13, and go to the next operation in sequence. (For example, if operation #4 consists of two tandem pieces of equipment, enter cell code 534 in cell 535 of Column 9.)
  
6.      If more than two pieces of equipment were used in tandem, repeat steps 2 and 3 for each additional piece of equipment.

Be sure each required column is completed for every piece of equipment used to grow the 1996 crop on the selected CORN field.

Chapter 5  
Section H

**EXAMPLE:** The following example illustrates how tandem operations should be recorded in the FIELD OPERATIONS TABLE on 1/2 CORN PRODUCTION PRACTICES & COSTS.

CODES FOR COLUMN 5	
1	You (The Operator)?
2	Partner?
3	Unpaid Worker?
4	Paid Part-time or Seasonal Worker?
5	Paid Full-time Worker?
6	Custom Applicator? --[Go to Column 13.]

<b>INCLUDE FERTILIZER and PESTICIDE</b>
<b>INCLUDE CUSTOM OPERATIONS</b>

[If column 5 is code 6 (CUSTOM), skip columns 7-11.]

2 S E Q U E N C E  No.	3 What operation or equipment was used?	4 [Record machine] code from Respondent Booklet.]	5 Who was the machine operator- - [Enter code from above. If code = 6 (CUSTOM), go to column 13.]  CODE	7 What was the size or swath of the [machine] used?	8 [Record size code.] 1 FEET 2 ROW 3 MOLDBOAR D (bottoms)  HAULING 4 POUNDS 5 BUSHELS 6 TONS	9 Which tractor was used? [Record line number from item 1.] 66 Animal Drawn 77 Pick-Up 88 Other Trucks 99 Self- Propelled	10 How many acres were covered ? 1/  ACRES	11 What were the acres covered per hour?  ACRES PER HOUR	13 In what month was this operation done?  MM
0369 1	Chisel Plow	0394 1	0424 1	0471 15	0501 1	0531 3	0561 65.0	0586 4.0	0641 3
0370 2	Tandem Disk	0395 15	0425 5	0472 30	0502 1	0532 1	0562 65.0	0587 7.5	0642 4
0371 2	Spring Tooth Harrow	0396 39	0426	0473	0503	0533 532	0563	0588	0643
0372 3	Field Cultivator	0397 21	0427 1	0474 30	0504 1	0534 1	0564 65.0	0589 8.0	0644 4

**Item 4      Field Operations - TANDEM OPERATIONS**

**V3 ONLY**

*Flue-Cured Tobacco Production Practices & Costs only*

When a farmer reports a tandem field operation:

1. Record the first piece of equipment just like any single machine field operation. Enter the data for all remaining columns in that line.
2. On the next line, record the tandem operation in Column 3 and the machinery code of the second piece of equipment in Column 4. Skip Columns 6, 7, and 8.
3. In Column 9, enter the cell code of the Column 9 cell containing the Item 1 line number of the tractor pulling the pieces. This is on the same line as the first machine in the tandem sequence. Entering the cell code number will indicate which tractor is providing the power for both implements. Skip Column 12, and go to the next operation. (For example, if operation #4 consists of two tandem pieces of equipment, enter cell code 534 in cell 535 of Column 9.)
4. If more than two pieces of equipment were used in tandem, repeat steps 2 and 3 for each additional piece of equipment.

Be sure each required column is completed for every piece of equipment used to grow the 1996 crop on the selected FLUE-CURED TOBACCO field.

Chapter 5  
Section H

**EXAMPLE:** The following example illustrates how tandem operations should be recorded in the FIELD OPERATIONS TABLE on *V3* FLUE-CURED TOBACCO PRODUCTION PRACTICES & COSTS.

[If column 6 is code 1 (CUSTOM), skip columns 7-12.]

3 What operation or equipment was used?	4 [Record machine code from Respondent Booklet.]	6 Was this a custom operation? YES - [Enter code 1 and go to next operation.]  NO - [Continue.]	7 What was the size or swath of the [machine] used?	8 [Record size code.] 1 FEET 2 ROW 3 MOLDBOARD (bottoms)  HAULING 4 POUNDS 5 BUSHELS 6 TONS	9 Which tractor was used? [Record line number from item 1.] 66 Animal Drawn 77 Pick-Up 88 Other Trucks 99 Self-Propelled]	12 How many acres were covered? [Total acres covered X number of times over.]  1/  ACRES
Chisel Plow	0394 1	0441	0471 15	0501 1	0531 3	0611 11.5
Tandem Disk	0395 15	0442	0472 30	0502 1	0532 1	0612 11.5
Spring Tooth	0396 39	0443	0473	0503	0533 532	0613
Field Cultivator	0397 21	0444	0474 30	0504 1	0534 1	0614 11.5

**Item 5      Other labor used on the field**

**V2 ONLY**

*Corn Production Practices & Costs only*

The purpose of this item is to collect data on labor used on the selected corn field for activities other than operating machines. This data will be combined with the information collected in the Field Operations Table to compute the total labor used on this corn field. Acres Covered and Acres per Hour will be used to calculate the labor hours spent operating machines for each field operation. This data will be combined with labor hours collected in Item 5 to provide an estimate of the total labor hours used to produce corn on the selected field. These calculations save us from having to ask for ALL the labor hours separately. In addition, wage rates are collected for ALL the paid workers that worked on the field, so that labor costs can be calculated as well.

The procedure used in Item 5 to collect labor hours is to ask the operator to identify and list all the workers that worked on the selected field, and then ask how many hours each worker or each group of workers spent doing various activities on that field to produce the 1996 corn crop. This procedure is called a roster. It was developed because, in past surveys, many enumerators tended to use a procedure like this to add up labor hours for various types of workers. We developed the roster for this survey so that all enumerators could take advantage of the same method that already was working well for some enumerators.

Complete Item 5 by listing all the workers in Column 1 first, and then complete Columns 2-6 for each worker or group of workers reported in Column 1.

**Item 5      Workers**

**Column 1**

**V2 ONLY**

*Corn Production Practices & Costs only*

Begin by listing all workers, both paid and unpaid, who provided labor to produce the 1996 corn crop on the selected corn field.

If the operator, partners, or the operator's spouse worked on the selected field, check the check-boxes in Column 1 and continue.

List workers using whatever identifier is comfortable for the respondent. If names are used, record first names only. Workers may be identified by their relation to the operator, or by the type of work. For example, the operator may identify a daughter, a grandson, a hired hand, and the tractor driver as workers on the field.

If several workers of the same type were used, they may be grouped and listed on a single line. Workers may be grouped in any manner convenient for the respondent. For example, the respondent may group workers by type of work, such as all workers hauling grain away from the field.

Data recorded in Columns 3, 4, and 5 must be the same for all workers grouped together. For example, a paid part-time worker making \$8.00 per hour should be listed on a separate line from another paid part-time worker making \$6.50 per hour. Also, if the same worker routinely worked both paid and unpaid hours, record these on separate lines.

Be sure to include ALL workers that worked on the selected field to produce the 1996 corn crop. Be sure to include workers that did activities other than driving tractors or operating equipment on the selected field. Probe to include workers who worked on the field during the fall of 1995 to prepare for the 1996 crop, or earlier if the field was left fallow during 1995. Exclude contract or custom labor.

After completing the list of all workers in Column 1, proceed to complete Columns 2-6 of the table for each worker or group of workers listed. It is important to identify all workers in Column 1 first before asking additional questions, because the respondent may decide to leave out some workers to avoid the additional questions you'll be asking about each one.

**Item 5          Number of workers**

**Column 2**

**V2 ONLY**

*Corn Production Practices & Costs only*

Enter the number of workers in the group listed in Column 1. If an individual worker is recorded in Column 1, enter the number "1." If the PARTNERS box in Column 1 is checked, enter only the number of partners working on the selected field, not the total number of partners.

**Item 5          Paid or unpaid worker**

**Column 3**

**V2 ONLY**

*Corn Production Practices & Costs only*

Record whether the worker or group of workers listed in Column 1 was:

Code 1 - PAID

Code 2 - UNPAID.

If box for the operator's SPOUSE is checked in Column 1, determine if he/she is a PAID or UNPAID worker on the operation.

For PAID workers (code 1), complete Columns 4 and 5, then continue on to Column 6. For UNPAID workers (code 2), skip to Column 6.

**Item 5      Type of worker**

**Column 4**

**V2 ONLY**

*Corn Production Practices & Costs only*

If Column 3 is Code 1(PAID), determine whether each PAID worker or group of PAID workers listed in Column 1 is:

Code 1 - FULL TIME

Code 2 - PART TIME

Code 3 - SEASONAL.

**Item 5      Wage rate for paid workers**

**Column 5**

**V2 ONLY**

*Corn Production Practices & Costs only*

For PAID workers only (Column 3 is Code 1), record the cash wage rate paid for ALL the work performed on this field by each worker or group of workers listed in Column 1. Enter the wage rate in dollars and cents per hour.

If the worker is paid by the week or month, or is paid an annual salary, you will need to probe for an estimate of the average number of hours worked per week, month, or year. Then calculate the hourly wage. For example, if a worker is paid \$1500 per month and works an average of 200 hours per month, then compute the hourly wage rate as  $1500 \div 200 = \$7.50$  per hour. Enter 7.50 in Column 5.

**Item 5          Hours worked on field**

**Column 6**

**V2 ONLY**

*Corn Production Practices & Costs only*

For each worker or group of workers listed in Column 1, record the total hours worked on this corn field in ALL activities other than operating machines, which were just reported in Item 3. This includes, but is not limited to, scouting, irrigation, hauling with trucks, and drying the corn from this field. Also include hours used moving machinery and equipment to and from the field, time spent loading materials into equipment, or management activities associated with the selected field only. Report the **total hours** worked by each worker or group of workers listed in Column 1, **only for activities done on this field.**

**Item 6          Percent of unpaid work done by those under 16**

**V2 ONLY**

*Corn Production Practices & Costs only*

Considering the total hours worked by unpaid workers on this field (Column 1 workers with Code 2 (UNPAID) in Column 3 in Item 5), enter the percent of those hours worked by unpaid workers who were under 16 years old.

Remember that this question is about the percent of ALL the hours worked on this field by UNPAID workers, not just the hours recorded in Column 6 of Item 5 (which accounts for only non-machine hours).

We will value unpaid labor hours dedicated to the corn crop with an appropriate wage rate to estimate the economic cost of unpaid labor. Since younger workers are often paid less than more experienced workers, we want to separate unpaid labor hours for workers under 16 so we can value them with a different wage rate.

**Item 7          Custom and technical services**

**V2 & V3 ONLY**

*C & Flue-Cured Tobacco Production Practices & Costs only*

Custom operations and/or technical services performed on the field in 1995 for the 1996 crop should be included. Exclude custom fertilizer and chemical applications. These have been recorded in earlier sections.

Sometimes farmers rent machines and operate them themselves. This isn't custom service, it's machinery rental. Exclude machinery rental in this section. Operations performed with rented machinery should be reported in the FIELD OPERATIONS table, Item 3 (V2) or Item 4 (V3). Exclude "swap" labor (work done on the selected operation by a friend or neighbor in return for the selected operator's working on the friend or neighbor's operation). These operations should also have been included in the FIELD OPERATIONS table in each version.

**NOTE:** There is an error on page 16 of *Version 3* FLUE-CURED TOBACCO PRODUCTION PRACTICES AND COSTS REPORT. The page header on page 16 says "Section I: Irrigation--selected field," although this page is still part of Section H: Field Operations and Custom Services--selected field. Be careful to not skip Item 7 by mistake because of the error in the page header. **Item 7 on page 16 must be asked of all respondents.**

**Item 7          Custom or technical service**

**Column 1**

**V2 & V3 ONLY**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

Several custom or technical services are listed. ALL custom field operations were obtained in the Field Operations Table. Refer back to the Field Operations Table (*Version 2* Item 3 or *Version 3* Item 4) and identify which custom or technical services listed in Column 1 were performed on the selected field. CHECK the check box in Column 1 for each custom operation reported in the Field Operations Table. Ask Columns 2 and 3 for each item checked.

Notice that Item 7h on *Version 2* CORN and Items 7a, 7g, and 7h on *Version 3* FLUE-CURED TOBACCO have pre-printed X's in their check-boxes. These items **must** be asked of everyone. These items are custom or technical services that may have been performed on the selected field, but they are not field operations that you would have found out about in the Field Operations Table.

**Item 7          Cost per acre for the custom/technical service**

**Column 2**

**V2 & V3 ONLY**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

Record the operation's cost per acre for each custom operation or agricultural service done on the field. Include all custom work or technical service fees paid by landlords. Record the cost in dollars and cents per acre.

**Item 7      Landlord custom and technical fees**

**Column 3**

**V2 & V3 ONLY**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

For each of the custom or technical services used on the selected field for the 1996 corn or flue-cured tobacco crop, record either the percent of the cost paid by the landlord, or the total dollar amount paid by the landlord for this field.

**Item 8      Yield monitor**

**V6, V7, & V10 ONLY**

*Soybeans & Wheat only*

Determine if the harvesting equipment (combine) used or to be used on the selected field has (had) a yield monitor.

A yield monitor is a piece of equipment mounted on a combine to measure the yield at regular intervals as the combine moves through the field. These yield measurements can be tied to specific locations in the field through a global positioning system (GPS), which uses information from satellites pinpoint field locations. Then a map of the yields across the field can be drawn using the information.

If a yield monitor was (will be) used, continue with Item 8a. If a yield monitor was not used, go to Section I. On *Version 10*, if a yield monitor was not used, go to Item 6 for COTTON, **or** go to Section I for ALL OTHER CROPS.

**Item 8a      Yield map**

**V6, V7, & V10 ONLY**

*Soybeans & Wheat only*

If the harvesting equipment has (had) a yield monitor (item 8 coded YES =1), then ask if a yield map was or will be produced from the data obtained by the monitor.

A yield map is a map prepared from information collected by a yield monitor. It shows how yield vary for small areas within a field. A yield map can be used to help the operator decide about practices used within the field, such as changes in fertilizer or pesticide applications.

**Item 9      Moldboard plow used on cotton**

**V8 & V10 ONLY**

*Cotton only*

Ask the respondent if a moldboard plow was used to prepare the selected field for seeding the 1996 cotton crop. If YES, enter code 1 and ask Item 9a. If NO, go to Item 10.

**Item 9a      Date moldboard plow used**

**V8 & V10 ONLY**

*Cotton only*

If a moldboard plow was used (Item 9 is code 1 = YES), then ask when the selected cotton field was plowed using the moldboard plow.

If the operator is not able to come up with the specific date when the moldboard plow was used on the selected cotton field, ask for the WEEK in which the operation was performed, using the CALENDAR showcard. Then enter the date of the WEDNESDAY of that week. For example, if the operator says that the cotton field was plowed using the moldboard plow during the week of March 31 - April 6, 1996, then record 4 03 96, which is the date of the WEDNESDAY of that week.

**Item 10      Stale seedbed**

**V8 & V10 ONLY**

*Cotton only*

Determine if a "stale seedbed" system was used to prepare this field for seeding this cotton crop. A "stale seedbed" system has all tillage done in the fall after harvest. Either a cover crop is seeded or weeds are left. Only a "burndown" herbicide is applied in the spring before planting, with NO spring preplant tillage operations.

## SECTION I - IRRIGATION

### What's this Section for? How is the information used?

This section is used in a way similar to field operations in that the questions are designed to identify operating characteristics of irrigation system(s) and the amount and source of water used on the selected commodity field. Engineering relationships are then applied to the field information to estimate irrigation costs.

There can be more than one type of irrigation system used on a particular crop field. To save space and interview time on the Production Practices and Costs *Versions 2* and *3*, information is only collected for the two most common systems used on the field corn or flue-cured tobacco. The costs derived from the irrigation data are reported in cost-of-production budgets in several places. For example, the cost of purchased irrigation water obtained in this section is reported under a budget line item called "Purchased Irrigation Water." Operation costs of the irrigation systems listed in other parts of the section are reported under budget line items for fuel, repairs, capital replacement, etc., just like machinery costs.

Irrigation methods usually involve using either pressurized or gravity-flow systems. Pressurized systems can involve various types of sprinkler or low-flow drip/trickle systems. Gravity-flow systems can involve various types of flood or furrow irrigation systems and subirrigation systems. How water is applied depends on the crop features, the physical features of the land (slopes, hills, and gullies), the type of soil, the amount of water available, how well special equipment would work, and the cost. To conserve both water and money, it is necessary to have some degree of control over the amount of water applied and the distribution of water across a field. For example, when crops are over-watered, minerals are washed from the soil, salts build up and soil erodes. Also, when water is not applied uniformly across a field, crop yield is reduced.

### Item 1      Acres irrigated in this field

Record the number of acres in the selected commodity field that were irrigated for the 1996 crop. Enter the number of irrigated acres to the nearest TENTH.

Acreage should be counted as irrigated if water was applied at least once during the growing season or if the acres were irrigated before planting. If only part of a field was irrigated, count only the acres that actually were irrigated. Even though the crop may have received water several times, count irrigated acres only once.

In some states, non-irrigated land may also be called "dryland".

**EXCLUDE FROM IRRIGATED ACREAGE:**

- (1) acreage from the selected field which could have been irrigated (facilities were available) but which was not irrigated for the 1996 crop.
- (2) land for the selected field in irrigation ditches, trenches, borders, levees and skip rows.
- (3) fringe areas of the selected field (generally in fields with sprinkler systems such as center pivot systems) which did not receive water.

**Item 2          Irrigation operations**

In Item 2 of the Production Practices and Costs Versions, *V2 CORN* and *V3 FLUE-CURED TOBACCO*, include only the irrigation system(s) used to irrigate the selected field for the 1996 crop year. Fill out the table by asking Items 2b - 2n for each of the System Types identified in Item 2a. That is, go down the column labeled System 1 for the first system type named, then go down the column labeled System 2 for the second system type (if a second system was used). Information about at most two system types can be collected.

In Item 2 of the Production Practices Versions, *V5, V6, V7, V8, V9, and V10*, Item 2b-2f are not broken down by system type. These versions ask for information about irrigation on the selected field in total, regardless of the type of system used.

**Item 2a          Type of system(s)**

***V2 & V3 ONLY***

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

Record the System Type Code(s) in columns 1 and 2 for at most two irrigation systems used to irrigate most of the acres on the selected field for corn or flue-cured tobacco during the 1996 growing season. Don't list any system or irrigation technology that wasn't used on corn or flue-cured tobacco for this field, even if it was used on other fields or other crops on the farm operation. If only one system was used on this field, then use only Column 1 for responses to questions 2a - 2n.

The Irrigation System Type Codes are:

### **PRESSURE SYSTEMS**

- Code 1 - HAND-MOVE
- Code 2 - SOLID or PERMANENT SET
- Code 3 - SIDE ROLL or WHEEL LINE
- Code 4 - CENTER PIVOT or LINEAR MOVE  
with sprinklers on main line
- Code 5 - CENTER PIVOT or LINEAR MOVE  
with sprinklers below main line,  
but more than 2 feet above ground
- Code 6 - CENTER PIVOT or LINEAR MOVE  
with sprinklers less than 2 feet above ground
- Code 7 - BIG GUN
- Code 8 - LOW-FLOW IRRIGATION  
(drip, trickle, or micro sprinkler)
- Code 9 - OTHER pressure system -- SPECIFY TYPE

### **GRAVITY SYSTEMS**

- Code 10 - SIPHON-TUBE SYSTEM from unlined ditches
- Code 11 - SIPHON-TUBE SYSTEM from lined ditches
- Code 12 - PORTAL- OR DITCH-GATE SYSTEM from unlined ditches
- Code 13 - PORTAL- OR DITCH-GATE SYSTEM from lined ditches
- Code 14 - POLY-PIPE SYSTEM
- Code 15 - GATED PIPE (not poly pipe)
- Code 16 - IMPROVED GATED PIPE (surge flow or cablegation, not poly pipe)
- Code 17 - SUBIRRIGATION
- Code 18 - OTHER gravity system -- SPECIFY TYPE

Each of these irrigation systems is described in the EXHIBIT at the end of this section beginning on page 5162. The descriptions are designed to explain system characteristics and how the system applies the water to the field. These systems are on-farm, field-level irrigation technologies and do not describe the water distribution systems of an irrigation district or company.

Additional system descriptions are provided in the EXHIBIT for an end-tow sprinkler and carousel sprinkler-traveler system. If either of these systems are used on the field, enter them as a side roll/wheel line system using a code 3.

Additional system descriptions are also provided in the EXHIBIT for big-gun systems, including descriptions for a self-propelled big-gun system, and descriptions for both reel-type hose pull and reel-type cable pull systems that use large gun-type sprinklers. Each of these systems should be entered as a big-gun system using a code 7.

**Item 2b Total inches of water applied per acre**

Record the total number of inches of water applied per acre to the selected field during the entire 1996 crop year for the target crop. In *V2* and *V3* record this separately for each Irrigation System Type recorded in Item 2a. Include any preplant water application.

**Item 2c Total hours water was applied**

This item is asked only if the operator cannot provide a response to Item 2b.

The operator should estimate the total amount of time in hours that water was applied to the selected field during the 1996 growing season. In *V2* and *V3* this should be obtained separately for each irrigation system. This is equivalent to estimating (for each system) the total number of hours each system was in operation for the selected field during 1996. It is possible, for some fields, that the total hours of system operation may range for one to greater than 1000 hours.

For example, if a system was used to irrigate a field three different times during the growing season - once continuously for six days, the second time for eight days (but only from 8 p.m. to 8 a.m. daily), and the third time continuously for six more days - then the total number of hours this system irrigated this field was 384. This is computed as follows:

First irrigation: 6 days (irrigation non-stop, day and night) --->  $6 \times 24 = 144$  hours  
Second irrigation: 8 days (irrigation from 8 p.m. to 8 a.m. daily) --->  $8 \times 12 = 96$  hours  
Third irrigation: 6 days (irrigation non-stop, day and night) --->  $6 \times 24 = 144$  hours

---

Total = 384 hours

**Item 2c(1) Average gallons per minute**

***V5, V6, V7, V8, V9, & V10***

*Corn, Soybean, Wheat, Cotton, Potatoes*

Record the operator's best estimate of the average gallons per minute that the irrigation system(s) applied water to the selected field during the hours of irrigation reported in Item 2c.

**Item 2d      Percent of water applied after planting**

**V5, V6, V7, V8, V9, & V10**

*Corn, Soybean, Wheat, Cotton, Potatoes*

Record the operator's best estimate of the percent of all the water applied to the selected field that was applied after planting.

**Item 2e      Percent surface water used**

Water sources can involve surface water and/or ground water (water from wells). Sometimes the same acres are irrigated using more than one source of water. Record the operator's best estimate of the percent of all the water used to irrigate the selected field that came from surface water sources.

Sometimes a single irrigation system uses more than one source of water. For each system type reported in *V2 CORN* and *V3 FLUE-CURED TOBACCO*, record the operator's best estimate of the percent of the total water the system used to irrigate the selected field that came from surface water sources. Percents for each system can range from zero to 100 percent.

**Surface Water Sources:** Surface water is water stored in natural ponds or lakes, flowing in streams and rivers, and water stored in man-made reservoirs. Surface water can originate on the farm or from off-farm sources. Water sources are different from water suppliers. Here, it does not matter who supplied the water to the farm. It only matters whether the water originated from a surface-water source.

**Item 2f      Number of times field was irrigated**

Record the number of times the selected field was irrigated during the 1996 crop year. A time period generally involves an uninterrupted amount of time the system was actively irrigating the field. Include all applications of water made to benefit the 1996 crop-year production for the selected field. Include any pre-plant water applications.

For each irrigation system reported in *V2 CORN* or *V3 FLUE-CURED TOBACCO*, record the number of times each system was used to irrigate the selected field for the 1996 crop.

For example, if a system was actively irrigating a field first for 6 days, later for 8 more days, later still for 5 more days, and finally later for 4 more days, then this system irrigated this field 4 different times during the growing season.

The number of times a field is irrigated during the growing season will vary across farms depending upon the system, and other characteristics such as soil type and season weather.

**Item 2f(1) Number of irrigations after planting**  
**V5, V6, V7, V8, V9, & V10**  
*Corn, Soybean, Wheat, Cotton, Potatoes*

Record here only the number of irrigations on the selected field that occurred after planting.

**Item 2g Pump type**  
**V2 & V3 ONLY**  
*Corn & Flue-Cured Tobacco Production Practices & Costs only*

To apply water to a field, some irrigation systems may have to lift the water from a well and/or put the water under pressure to distribute it across the field. Systems that pressurize water do so using a pump. For each system reported, identify and record the code for the most common pump type used to lift and/or distribute water across the field.

The code for pump type are:

- Code 1 - TURBINE
- Code 2 - SUBMERSIBLE
- Code 3 - CENTRIFUGAL
- Code 4 - BOOSTER
- Code 5 - SIPHON
- Code 99 - NO PUMP

If there is more than one pump used with a single system, such as a booster pump, etc., record the pump type for the pump closest to the water source for the field on the farm.

**Exclude** pumps owned and operated by an irrigation company or district even if the respondent is part-owner of the irrigation company.

If no pumps were used to get water to the field or to apply it (water flows by gravity only), enter code 99 and go to Item 2m.

**Item 2h      Average pumping rate**

**V2 & V3 ONLY**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

For each system reported, enter the average pumping rate in gallons per minute (GPM) for the pump type recorded for that system. Report the pumping rate(s) used during normal operation.

**Item 2i      System operating pressure**

**V2 & V3 ONLY**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

Ask this item whenever a pressure irrigation system is used (Item 2a is code 1-9). Enter the average system operating pressure in pounds per square inch (PSI). Report the system operating pressure used during normal operation.

**Item 2j      Motor type**

**V2 & V3 ONLY**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

Systems using a pump to deliver water to the field require a motor to operate the pump. For each system reported, enter the code which identifies the fuel or power type for the motor used to operate the pump type entered in Item 2g.

If a tractor was used, enter the motor type of the tractor.

The codes for motor type are:

- Code 1 - DIESEL
- Code 2 - GASOLINE
- Code 3 - LP GAS
- Code 4 - NATURAL GAS
- Code 5 - ELECTRICITY
- Code 6 - SOLAR POWER

**Item 2k      Average motor size**

**V2 & V3 ONLY**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

Enter the average horsepower rating of the motor type recorded in Item 2j. For tractors enter the PTO horsepower.

**Item 2l      *[item number 2l skipped intentionally]***

**Item 2m      Average flow rate**

**V2 & V3 ONLY**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

This item is asked only for the system(s) the respondent indicates that **NO PUMP** was used (code 99 entered in Item 2g).

If no pump was used with a system, then the respondent should estimate the average flow rate in gallons per minute that the irrigation system applied water to the selected field.

**Item 2n      All other acres irrigated with this system**

**V2 & V3 ONLY**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

For each irrigation system entered in Item 2a, record the number of ALL other crop acres (including other acres of the commodity of interest) and pasture land irrigated on this operation using the same irrigation system as used on the selected field. Include any other acres of the commodity of interest (corn or flue-cured tobacco) irrigated with the irrigation system used on the selected field. Exclude the acres for the selected field.

**Item 3      Purchased water**

If any water was purchased to irrigate the selected field, enter code 1 for YES and continue. If no purchased water was used, go to Item 4 on V2 and V3, or go to Item 7 on all other versions.

Water is considered purchased if the operator and/or landlord paid a fee for water used on the selected field and the water originates from an off-farm source. Do not consider water pumped from on-farm sources to be purchased water.

Water may be purchased from the U.S. Bureau of Reclamation; an irrigation district; mutual, private, cooperative, or neighborhood ditch associations or canal companies; and commercial or municipal water systems. The purchase fee may be a yearly fee or charges for each application of irrigation water.

Water that comes from an irrigation district, any water-supply ditch association, or any canal company should be considered purchased water no matter where the off-farm water supplier got the water. These water suppliers generally provide water through canals which are served with water from lakes, reservoirs, or rivers and streams. All water supplied by these organizations should be listed as purchased water. Even if an irrigation district, water-supply ditch association, or canal company does not charge a water fee, but only charges the producer for the cost of water delivery or for the maintenance cost of water delivery facilities, **report the water as purchased water.**

Sometimes a farmer near an area served by an irrigation district is charged a fee by the irrigation district even if the farm doesn't get any water from that district. The fee may be charged because there is a value attached to the groundwater recharge which occurs due to the use of irrigation district water by other irrigators in the area. When the operator pays a fee of this sort, but doesn't irrigate using irrigation district water, do not record the field as being irrigated with purchased water.

**Item 3a      Percent purchased water**

Record the operator's best estimate of the percentage of all the water applied to the selected field during the 1996 growing season that was purchased from off-farm water sources. The percentage may range from zero to 100 percent.

**Item 3b      Purchased water cost**

Record the total cost of the water purchased from off-farm water sources that was used to irrigate only the selected field for the 1996 growing season. Purchased water costs include the water fees and costs that are incurred to deliver the off-farm water to the farm for only this field.

Include in the expenses associated with purchasing the off-farm water for the field:

- (1) fees associated with the water quantity;
- (2) all fees not associated with water quantities, such as fees charged to cover water delivery and maintenance costs incurred by the off-farm water supplier; and

(3) any purchased water costs paid for by the landlord.

Exclude any costs associated with pumping or distributing the water on the farm or the selected field.

**Item 4 Replacement cost for siphon tubes**

**V2 & V3 ONLY**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

Ask this item only if a siphon-tube gravity system was used to irrigate the selected field of corn or flue-cured tobacco during the 1996 growing season (either column of Item 2a is code 10 or 11).

Record the operator's best estimate of the total cost to replace all of the siphon tubes used on the selected field. This item provides data to calculate a cost for the irrigation system.

**Item 5 Cost for poly pipe**

**V2 & V3 ONLY**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

Ask this item only if poly pipe was used to irrigate the selected field of corn or flue-cured tobacco during the 1996 growing season (either column of Item 2a is code 14).

Record the total expense for poly pipe used to irrigate only the selected field. This item provides data to calculate a cost for the irrigation system.

**Item 6a Average diameter of gated pipe**

**V2 & V3 ONLY**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

If a gated-pipe system was reported in either column of Item 2a (code 15 or 16), record the average diameter of the gated pipe used for irrigating the selected field of the corn or flue-cured tobacco during the 1996 growing season.

**Item 6b Total length of gated pipe for field**

**V2 & V3 ONLY**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

Record the total length (in feet) of all the gated pipe used in irrigating only the selected field of corn or flue-cured tobacco during the 1996 growing season.

**Item 7      Water from wells**

If water from wells (ground water) was used to irrigate the selected target commodity field for the 1996 crop, enter code 1 for YES and continue. If water from wells was not used to irrigate the selected field, go to Item 8 on *V2 CORN* and *V3 FLUE-CURED TOBACCO* or go to the Conclusion on all other versions.

**Item 7a      Number of wells**  
***V2 & V3 ONLY***

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

Record the number of wells used to irrigate the selected field of corn or flue-cured tobacco during the 1996 growing season. The wells could also have been used to irrigate other fields, but they must have been used at least partly to irrigate this field.

**Item 7b      Average well casing diameter**  
***V2 & V3 ONLY***

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

Record the average diameter of the outer well casing of all the wells used to irrigate the selected field of corn or flue-cured tobacco during 1996. The average diameter of the outer well casing will probably be between 12 and 36 inches; 20 inch casings are relatively standard throughout much of the West. Do not record the average diameter of the well column pipes (the well pipes the pumps are attached to).

**Item 7c      Average pumping depth**  
***V2 & V3 ONLY***

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

Record the average pumping depth (in feet) of the wells used to irrigate the selected field of corn or flue-cured tobacco during 1996.

Well pumping depths depend on the level of the water table and the amount of drawdown on the water table during pumping. In other words, pumping depth is the depth to water at the start of

the irrigation season, plus an average decline in the water level caused by pumping during the irrigation season.

**Item 7d      Pumping costs**

**V5, V6, V7, V8, V9, & V10**

*Corn, Soybean, Wheat, Cotton, Potatoes*

Record the total fuel and power expenses incurred to pump the irrigation water from wells used to apply water to the selected field of the target crop during 1996. Fuel and power pumping costs may include expenses for fuels, lubrication, and electricity. Include the landlord's share of total pumping costs and any pumping expenses incurred for preplant irrigation applications.

**Item 8      Additional pipe used**

**V2 & V3 ONLY**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

This question is asked to find out if any other pipe besides pipe that was part of the irrigation system itself was used for irrigating the selected field of corn or flue-cured tobacco during 1996. Additional pipe includes mainline or lateral pipe but not the pipe that is in the system itself. If additional pipe was used on the selected field, enter code 1 for YES and continue. If no additional pipe was used, go to Item 9.

A mainline pipe connects the pump or water source and the field or the lateral pipes. Mainline pipes can be either portable or buried in the ground.

Lateral pipes are pipes that carry water from the mainline pipe to the discharge or distribution point in the field. There can be more than one lateral pipe, and they can be permanent or portable.

**Item 8a      Most common type of additional pipe used**

**V2 & V3 ONLY**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

Enter the code for the most common type of mainline or lateral pipe used. Exclude pipe that is part of the irrigation system, such as gated pipe, sprinkler pipe, etc.

**Item 8b      Average diameter of additional pipe used**

**V2 & V3 ONLY**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

Record the diameter in inches of the additional mainline or lateral pipe used. If there are different diameters of pipe used, record the average diameter.

**Item 8c Feet of additional pipe used**

**V2 & V3 ONLY**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

Enter the total feet of mainline or lateral pipe used to carry water to the selected field of corn or flue-cured tobacco during 1996. Exclude pipe that is part of the irrigation system, such as gated pipe, sprinkler pipe, etc.

**Item 9 Landlord irrigation expenses**

**V2 & V3 ONLY**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

Ask Items 9a - 9c only if the selected field was CASH or SHARE rented (Item 2 of Section D is code 2 or 3). If the field was not rented, go to Item 10 in V2 CORN or go to Section K in V3 FLUE-CURED TOBACCO.

In Items 9a - 9c, enter the landlord's share of irrigation costs incurred only for the selected field of corn or flue-cured tobacco during the 1996 growing season. If the landlord owns and maintains the irrigation system and pays all costs, probe for the operator's best estimate of the landlord's costs for the selected field for each cost item 9a - 9c.

**Item 9a Landlord irrigation fuel expense**

**V2 & V3 ONLY**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

Record the landlord's share of total expenses for fuels, lubrication, and electricity used to irrigate the selected field of corn or flue-cured tobacco during 1996. Enter the landlord's share in either percent or total dollars.

**Item 9b Landlord irrigation repair expense**

**V2 & V3 ONLY**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

Record the landlord's share of total expenses for repairs made to the irrigation equipment used to irrigate the selected field of corn or flue-cured tobacco during 1996. Enter the landlord's share in either percent or total dollars.

**Item 9c Landlord irrigation water expense**

**V2 & V3 ONLY**

*Corn & Flue-Cured Tobacco Production Practices & Costs only*

Record the landlord's share of the total purchase cost of the irrigation water purchased to irrigate the selected field of corn or flue-cured tobacco during 1996. Enter the landlord's share in either percent or total dollars. (Purchased water is water purchased from an off-farm water source as defined for Item 3.)

**Item 10 Field run-off**

**V2 ONLY**

*Corn Production Practices & Costs only*

Record the code the operator indicates best describes what happens to the run-off from irrigation for the selected corn field.

Field run-off is the portion of the irrigation water applied to the field that does not soak into the soil in the part of the field where the crop is growing. It flows across a field and collects to form a pool of extra water at the end of the field, or it flows off the field. The pool of extra water is not large enough or doesn't last long enough to prevent normal farming operations for the field;

The codes describing field run-off are:

**Code 1 - RETAINED AT THE END OF THE FIELD:** This is when the pool of extra water is held at the end of the field because the field is bordered or there is a natural basin at the end of the field. The run-off is not re-used for irrigation.

**Code 2 - RE-USED TO IRRIGATE ON THE FARM:** Extra irrigation water from the field collects in an on-farm lake, pond, or pit below the field, and is re-used to irrigate the same field or another field on the farm.

**Code 3 - COLLECTED IN EVAPORATION PONDS ON THE FARM:** The extra irrigation water collected in an on-farm pond or pit below the field is not re-used for irrigation. Instead it remains in the pond or pit until it evaporates. Evaporation ponds are sometimes used for disposal of poor quality drainage flows.

**Code 4 - DRAINED FROM THE FARM:** Run-off drains off the field and away from the farm through man-made drainage ditches or natural water courses. Run-off drained from a farm may be recovered by another farm or it may re-enter the water supply downstream as return flow.

**Code 5 - or IS THERE NO RUN-OFF:** Irrigation water is applied to the field so that no extra water collects at the end of the field or drains from the field.

This question is like a multiple choice question. Be sure to read ALL of the items in the Run-Off Code List before accepting an answer from the respondent. The respondent may want to answer before hearing all the possible answers, and one of the later codes may be the best answer. Do not ask "Was there any run-off from this field?" or "What happens to the run-off from this field?". These questions are not correct. Many operators will say there is no run-off when, in fact, one of the other codes is what really happens. The respondent will not know that these codes are acceptable answers if you don't read ALL of them before accepting an answer.

**EXHIBIT:  
IRRIGATION SYSTEMS**

**PRESSURE SYSTEMS**

**HAND-MOVE SPRINKLER SYSTEM (Code 1):** Portable pipe system, usually aluminum pipe, which must be moved by hand one or more times per day during irrigation periods. Irrigation requirements of the field are met by successive moves of the system to water one strip of the field at a time (an irrigation set). The system's sprinklers can use a variety of orifice sizes and configurations. The system may be adapted to most soil types, topography, field size and shapes; however, it is not suited for all crops since tall crops, such as corn, hinder pipe movement. The sprinkler line(s) are served water by mainlines of aluminum or PVC that may be buried or above ground.

**SOLID-SET OR PERMANENT SPRINKLER SYSTEMS (Code 2):** A buried pipe system with only the risers and sprinklers above ground, or a portable pipe system which is placed in the field at the start of the irrigation season and left in place to the season end. Both of these system types require no labor to move the system to a new location once established for the irrigation season. Adapted to most crops, soil types, topography, field sizes and shapes.

**SIDE-ROLL OR WHEEL-LINE SPRINKLER SYSTEMS (Code 3):** A wheel-move, lateral-line system which moves as a unit in fixed increments (irrigation sets) across the field. The system is powered by a small gasoline engine that is manually operated. The system is stationary while irrigation is taking place. Some variations of the system may have tow lines trailing the main lateral line with additional sprinklers on each tow line. Tow line systems irrigate a wider strip at each set, up to 180 feet compared to the 60-foot strip of standard side-roll systems. Wheels are generally spaced 40 feet apart and are 5-7 foot in diameter, with the main system pipe serving as an axle in the middle of the wheel. The system is designed for reasonably flat, rectangular or square fields and is suited to crops less than 4 feet in height. The sprinkler may use flexible hose, aluminum pipe, or PVC pipe to connect to mainlines (above or below ground) or on-site pressurization pumps.

**END-TOW SPRINKLER SYSTEM:** Wheel or skid, lateral-line system which is end-towed via tractor to new locations in the field. The system is stationary while irrigation is taking place. System is designed for reasonably flat or slightly rolling, rectangular or square fields with an alley through the center of the field. Designed for hay and pasture irrigation, the system may be used on some row crops and orchards. **INCLUDE as a side-roll system (Code 3).**

**EXHIBIT: IRRIGATION SYSTEMS, continued**

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**CAROUSEL SPRINKLER-TRAVELER SYSTEM:** Wheel-mounted system with a rotating boom that sprinkles or sprays water. The system may be self-propelled with a mounted engine, or towed via pick-up or tractor to the next field location (irrigation set). Water is supplied to the system by hose or supply ditch. **INCLUDE as a side-roll system** (Code 3).

**CENTER PIVOT OR LINEAR MOVE WITH SPRINKLERS ON MAIN LINE** (Code 4): Self-propelled, continuous-move sprinkler system that either travels in a circle (center pivot) or laterally (linear move) across a field. Sprinklers are located **directly on** the system's main water-supply pipe, which is supported by A-frame towers. Some circle systems have features that provide coverage of most of the corners on a square field. Some systems may be towed to adjacent fields to increase system use by irrigating a different crop with different timing of water needs. Water is delivered to a fixed center point for center-pivot systems and by hose or supply ditch for lateral move systems. Center-pivot systems have been developed for areas from 40 to 240 acres, but most systems irrigate 128-132 acres of a square 160 acre field. Lateral moves require a square or rectangular field of 40 to 240 acres. These systems may be adapted to most crops, soil types, and level to gently-rolling topography. Systems with sprinklers directly on the main water-supply line will tend to be medium to higher pressure (above 30 psi) and use impact sprinklers.

**CENTER PIVOT OR LINEAR MOVE, WITH SPRINKLERS BELOW THE MAIN LINE, BUT MORE THAN 2 FEET ABOVE THE GROUND** (Code 5): Self-propelled, continuous-move sprinkler system that either travels in a circle (center pivot) or laterally (linear move) across a field. Sprinklers or sprayers are located on drop-tubes or booms suspended **below** the system's main water-supply pipe, but **more than 2 feet above the ground**. This includes most standard drop-tube sprinkler systems. Some circle systems have features that provide coverage of most of the corners on a square field. Some systems may be towed to adjacent fields to increase system use by irrigating a different crop with different timing of water needs. Water is delivered to a fixed center point for center-pivot systems and by hose or supply ditch for lateral move systems. Center-pivot systems have been developed for areas from 40 to 240 acres, but most systems irrigate 128-132 acres of a square 160 acre field. Lateral moves require a square or rectangular field of 40 to 240 acres. These systems may be adapted to most crops, soil types, and level to gently-rolling topography. Systems with sprinklers below the main water-supply line will tend to be lower pressure (below 30 psi), with spray nozzles rather than impact sprinklers.

**EXHIBIT: IRRIGATION SYSTEMS, continued**

**CENTER PIVOT OR LINEAR MOVE, WITH SPRINKLERS LESS THAN 2 FEET ABOVE THE GROUND** (Code 6): Self-propelled, continuous-move sprinkler system that either travels in a circle (center pivot) or laterally (linear move) across a field. Sprinklers or sprayers are located on drop-tubes suspended below the system's main water-supply pipe and are located **less than 2 feet above the ground**. This includes low pressure precision application systems (LEPA) and other below-the-crop-canopy systems. Some circle systems have features that provide coverage of most of the corners on a square field. Some systems may be towed to adjacent fields to increase system use by irrigating a different crop with different timing of water needs. Water is delivered to a fixed center point for center-pivot systems and by hose or supply ditch for lateral move. Center-pivot systems have been developed for areas from 40 to 240 acres, but most systems irrigate 128-132 acres of a square 160 acre field. Lateral moves require a square or rectangular field of 40 to 240 acres. These systems may be adapted to most crops, soil types, and level to gently-rolling topography. Systems with sprinklers suspended to within 2 feet of the ground tend to be very low pressure (below 15 psi) and use spray nozzles and bubblers. Some units may run water directly on the ground using a cloth-like extension attached to the drop tube.

**BIG GUN** (Code 7): A single, large gun-type sprinkler mounted on a trailer, carriage, or skid. Water is supplied to the sprinkler through a flexible hose. The mounted gun sprinkler is either pulled across a field or moved across a field using a self-propelled drive system for each irrigation set. An irrigation set is the area of the field that is irrigated by the gun sprinkler as it moves across the field. When an irrigation set is completed, the entire system is moved and the process repeated. The system is designed for straight rows, flat topography, and medium to high infiltration soils. It is best suited for crops that can withstand heavy bursts of water. Systems are high pressure, greater than 60 psi. Three specialty-type big-gun systems are defined below, including a self-propelled gun traveler system, a reel-type hose pull system, and a reel-type cable pull system.

**SELF-PROPELLED GUN TRAVELER:** Single, large gun on a four-wheel trailer. Self propelled by a separate engine or a hydraulic continuous move. Water is supplied through a flexible hose. Systems are high pressure, greater than 60 psi. **INCLUDE as a big gun system** (Code 7).

**EXHIBIT: IRRIGATION SYSTEMS, continued**

**REEL-TYPE HOSE PULL:** Single, large gun-type sprinkler on a carriage. A flexible, but noncollapsible hose is attached to a large reel at one end of the field. The carriage and sprinkler is attached to the unrolled hose and stationed at the other end of the field. Water movement through the hose activates a drive system that rolls the hose on the reel, drawing the sprinkler and carriage across the field. When an irrigation set is completed, the reel, sprinkler, and carriage may be moved and the process repeated. Systems are high pressure, greater than 60 psi. **INCLUDE as a big gun system** (Code 7).

**REEL-TYPE CABLE PULL:** Similar to hose-pull system, except a cable is used to reel the gun-type sprinkler and carriage across the field. This enables a flexible, collapsible hose to be pulled behind the carriage. When an irrigation set is completed, the cable reel, hose, sprinkler, and carriage may be moved and the process repeated. The system often requires a grass strip to operate on since the hose is pulled behind the unit. Systems are high pressure, greater than 60 psi. **INCLUDE as a big gun system** (Code 7).

**LOW-FLOW IRRIGATION SYSTEM (DRIP, TRICKLE, MICRO SPRINKLER)** (Code 8): Low-pressure systems designed for frequent water applications using small-diameter tubing and low-volume emitters to distribute water directly to the crop root zone. Tubing and emitters can be installed below ground, under plastic or mulch, or above ground, and alternatively, tubing may be installed below ground with emitters on risers above ground. While used primarily on trees, vines, and vegetable crops, these systems are only in limited use on field crops due to the high initial capital costs. Drip and trickle systems have been adapted to all crop types; micro-sprinklers are generally used on perennial crops where a larger wetted area is needed to encourage root development. These systems are adaptable to most soils and may be used on topography where slope prevents irrigation from other system types.

**EXHIBIT: IRRIGATION SYSTEMS, continued**

**GRAVITY-FLOW SYSTEMS**

**SIPHON-TUBE SYSTEM WITH UNLINED DITCHES (Code 10):** System uses short curved tubes, usually aluminum or plastic, to siphon water onto a field from an **unlined** ditch across the head of the field. Siphon tubes are curved to fit over the ditch bank and most range from 1 to 3 inches in diameter and from 3 to 5 feet in length. Water, once on the field, may flow down furrows, between borders or dikes, or in corrugations. The unlined ditch is formed with mechanical operations using only the soil on the field. The ditch may be reformed each year or reused with maintenance.

**SIPHON-TUBE SYSTEM WITH LINED DITCHES (Code 11):** System uses short curved tubes, usually aluminum or plastic, to siphon water onto a field from a **lined** ditch across the head of the field. Siphon tubes are curved to fit over the ditch bank and most range from 1 to 3 inches in diameter and from 3 to 5 feet in length. Water, once on the field, may flow down furrows, between borders or dikes, or in corrugations. The ditch may be lined with concrete, plastic, clay, or other nonporous material. The ditch is permanent and is reused each year.

**PORTAL- OR DITCH-GATE SYSTEM WITH UNLINED DITCHES (Code 12):** System uses openings in the ditch bank, either portals with covers or tubular openings closed with a gate, to discharge water onto a field from an **unlined** ditch across the head of the field. Portals in the ditch bank can be of any diameter and are covered with a metal, plastic, or wood cover to regulate water flow onto the field. Ditch openings can be any size, including openings for the entire flow of the ditch, and water-flow control gates can be made of wood, metal, plastic, or canvas. Water, once on the field, may flow down furrows, between borders or dikes, or in corrugations. The unlined ditch is formed with mechanical operations using only the soil on the field. The ditch may be reformed each year or reused with maintenance.

**PORTAL- OR DITCH-GATE SYSTEM WITH LINED DITCHES (Code 13):** System uses openings in the ditch bank, either portals with covers or tubular openings closed with a gate, to discharge water onto a field from a **lined** ditch across the head of the field. Portals in the ditch bank can be of any diameter and covered with a metal, plastic, or wood cover to regulate water flow onto the field. Ditch openings can be any size, including openings for the entire flow of the ditch, and water-flow control gates can be made of wood, metal, plastic, or canvas. Water, once on the field, may flow down furrows, between borders or dikes, or in corrugations. The ditch may be lined with concrete, plastic, clay, or other nonporous material. The ditch is permanent and is reused each year.

**EXHIBIT: IRRIGATION SYSTEMS, continued**

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**POLY PIPE SYSTEM (Code 14):** A system using a flexible, collapsible, plastic (polyethylene) tube up to 18 inches in diameter. The poly-tubing is unrolled along the head of the field and holes punched or closeable gates installed to match furrow, border, or dike width. A well or supply canal provides water to the tube. The tube is installed at the beginning of the irrigation season, and since it lays flat when not in use, can remain in the field the entire season. The tubing may be reused for more than one year, but single season use is most common.

**GATED PIPE (NOT POLY) (Code 15):** A system using rigid PVC plastic or aluminum pipe with manually-operated closeable gates at regular intervals. The pipe is installed at the head of the field, but may need to be removed for cultural operations or moved to new field locations through the season. The gates usually match row widths so water can flow directly into rows. Gated-pipe systems may also be used on flood or corrugation water-control systems. The pipe is reused for many years.

**IMPROVED GATED PIPE SYSTEM (SURGE FLOW OR CABLEGATION, NOT POLY)(Code 16):** A system using rigid PVC plastic or aluminum pipe with manually-operated closeable gates at regular intervals, but with an **automated water-control system**. Automated water control is achieved by (1) using a surge valve to alternate pipe sets receiving water, (2) using a moveable plug inside the gated pipe, controlled by a cable, to adjust the water flow from open gates, or (3) other automated methods using gated pipe to control water flow and improve the uniformity of water applications, such as pneumatically controlled bladders to regulate water flow on individual gates. Gated pipe is installed across the head of the field, but may need to be removed for cultural operations or moved to new field locations through the season. The gates usually match row widths so water can flow directly into rows. Gated-pipe systems may also be used on flood or corrugation water-control systems. The pipe is reused for many years.

**SUB-IRRIGATION (Code 17):** Maintenance of a water table at a predetermined depth below the field surface by using ditches or sub-surface drains and water-control structures. Water is added or removed as needed to maintain the water level of the water table at a specific depth using the ditches or drains. Lateral movement of water through the soil provides water to the crop root zone. Conditions for use of this system are limited. Land must be flat and suitable for rapid lateral water movement. The irrigation system may also be used as a drainage system.

**NOTES**

## **SECTION J - DRYING**

### **Version 2: Corn Production Practices & Costs Report**

#### **What's this Section for? How is this information used?**

After describing the drying systems used for corn, engineering relationships are used to estimate the operating and ownership costs of drying facilities. The drying systems use various fuels as a heat source and electricity to power the fans that force the air through the grain. As with other questionnaire sections, there can be several types of systems in use; only the most common are listed. The costs are added to other costs for things such as fuels and electricity, repairs, etc. Landlords' payments for part of the drying costs are listed.

#### **Item 1           Moisture content of corn**

Record the moisture content of the corn grain harvested from the selected field at the time of its harvest. If the moisture content varied across the field, report the moisture level at which the majority of corn was harvested. Enter the moisture content in TENTHS (1/10) of a percent.

If harvest of the selected field has not yet been completed, use the alternative wording in parentheses and obtain the operator's best estimate of the expected moisture content of the corn at harvest.

#### **Item 2a           Drying method-operators' share Column 2**

Record whether the operator's share of corn from the selected field was DRIED USING OPERATION'S FACILITIES (code 1), DRIED USING LANDLORD'S FACILITIES (code 2), CUSTOM DRIED (code 3), or NOT DRIED (code 4).

Landlord's facilities may be used for drying corn when land is rented under a CASH rent, a SHARE rent, or even a RENT-FREE arrangement. Be sure to offer this response category (code 2) for any operation with rental arrangements.

Custom drying may also be called commercial drying. If drying facilities on another operation were used to dry the corn from the selected field, record this as custom dried. Exclude the landlord's share.

**Item 2b      Drying method-landlord's share**  
**Column 2**

If the field is share rented, record whether the landlord's share of corn from the selected field was DRIED USING OPERATION'S FACILITIES (code 1), DRIED USING LANDLORD'S FACILITIES (code 2), CUSTOM DRIED (code 3), or NOT DRIED (code 4).

Landlord's facilities may be used for drying corn when land is rented under a CASH rent, a SHARE rent, or even a RENT-FREE arrangement. Be sure to offer this response category (code 2) for any operation with rental arrangements.

Custom drying may also be called commercial drying. If drying facilities on another operation were used to dry the corn from the selected field, record this as custom dried. Exclude operator's share.

**Item 2a      Custom drying cost--operator's share**  
**Column 3**

If the corn was custom dried (Column 2 = code 3), record the amount paid by the operator in either cents per bushel or total dollars for custom drying the corn from the selected field. If drying facilities on another operation were used to dry the corn from the selected field, record any rent paid for drying the corn from the selected field. Record the operator's estimate of the value of the drying if no direct cash payment was made (for example, if the commodity was dried free-of-charge on another operation). Exclude landlord expense.

**Item 2b      Custom drying cost--landlord's share**  
**Column 3**

If the landlord's share of corn from the selected field was custom dried (Column 2 = code 3), record the amount paid by the landlord in either cents per bushel or total dollars for custom drying the corn from the selected field. If drying facilities on another operation were used to dry the corn from the selected field, record any rent paid for drying the corn from the selected field. Record the operator's estimate of the value of the drying if no direct cash payment was made (for example, if the commodity was dried free-of-charge on another operation). Exclude operator's expense.

**Item 3          Enumerator instruction for skip**

If ANY of the corn from the selected field was dried using the operator's or the landlord's facilities (code 1 or 2 appears in either line of Column 2), then you must continue with Item 4. That is, if either the operator's share OR the landlord's share of corn from the selected field is dried using either the operator's or the landlord's facilities, then continue with Item 4. For example, if the landlord's share is dried using the operator's facilities, then Column 2 of Item 2b is code 1, and you must continue.

If both the operator's share and the landlord's share were CUSTOM DRIED, then go to Section K. If NONE of the corn from the selected field was dried, then go to Section K. The key to this instruction is that if ANY of the corn is DRIED, other than custom dried, then you must continue.

**Item 4a          Landlord fuel and/or electricity cost for drying**

If corn from the selected field was dried using this operation's facilities or the landlord's facilities, record the percent of total drying fuel and electricity cost paid by the landlord for drying the corn from the selected field. Alternatively, enter the total dollar amount paid by the landlord for fuel and/or electricity for drying this corn.

Some operators charge landlords a fixed rate per bushel for drying corn on their operations. This would be recorded as a Code 1 in Column 2 of Item 2b. In this case, the only way we have to capture the amount paid to the operator by the landlord is for you to make good notes of the arrangement. Write a note of the cost per bushel paid by the landlord. Then the survey statistician can convert it to total dollars using the landlord's share of production, and record it here as the landlord's contribution to the fuel and/or electricity cost for corn drying in Item 4a.

**Item 4b          Landlord repair cost for drying facilities**

If corn from the selected field was dried using this operation's facilities or the landlord's facilities, record the percent of total dryer repair cost, or the total dollar amount paid by the landlord for dryer repairs, for drying the corn from the selected field.

**Item 5          Description of the facilities used to dry corn from the selected field**

This item provides a picture of the type of drying facilities and methods used by the operation to dry corn from the selected field.

It should be asked only if Column 2 of Item 2 is 1 or 2, that is, drying of any portion of the corn from the selected field was done using this operation's facilities or the landlord's facilities. Include only those facilities used to remove moisture from corn by drying with heat (Item 5a) or by cooling or aeration (Item 5b). The main type of drying facility for each of these methods will be identified in Column 2. In Column 3, for facilities using heat, the drying method will be further specified.

**DRYING METHODS** are high temperature, low temperature, and cooling or aeration drying:

**High temperature drying** involves removing moisture by blowing air heated 100-200 degrees through the corn. If the air blown through the corn is heated to 25 or more degrees above the temperature around the dryer, the drying method should be considered high temperature.

**Low temperature drying** involves using fans to blow air (heated to 5 - 10 degrees higher than the temperature around the dryer) through the corn.

**Cooling or aeration drying** involves no heating, just removal of moisture by blowing air through the corn.

**FACILITY TYPES** are bin, continuous flow and batch:

**Bin dryers** are facilities attached to a grain bin which dry corn added to the bin. Bin dryers are commonly used with all drying methods listed above.

**Continuous flow dryers** are facilities outside a bin in which wet corn is continuously added at the top and is dried as it moves down through the facility. These dryers are used almost exclusively for high temperature drying, although they may have stages where the corn is cooled.

**Batch dryers** are facilities outside of a bin into which a batch of wet corn is added and dried. The batch dryer is then emptied and another batch is added. These dryers are used almost exclusively with high temperature drying, but may also be used for cooling.

#### **Item 5a      Main type of on-farm drying facility using heat**

Complete each column of item 5a for the **main** type of drying facility that used heat to dry corn from the selected field. If there was more than one type of drying facility using heat, report the type used to dry the most bushels by this method.

**Item 5b      Main type of cooling or aeration facility**

Complete each column of item 5b for the **main** type of on-farm cooling or aeration facility used to dry corn from the selected field. If more than one type of cooling or aeration facility was used, report the type used to dry the most bushels by this method.

**Item 5      Type of drying facility**  
**Column 2**

The codes in this column represent the type of drying facility used:

- Code 1 - BINS
- Code 2 - CONTINUOUS FLOW DRYERS
- Code 3 - BATCH DRYERS

These facility types are defined above in the general instructions above for Item 5.

In some cases, corn may be dried and cooled with the same facility. In this case, the same facility must be recorded in Column 2 of both Items 5a and 5b. Column 3 will identify the heating method for the facilities that used heat. For example, if BINS were used for drying corn using heat, enter code 1 in Column 2 of Item 5a. If the **same** bins also cooled or aerated the grain, code 1 will be entered again in Column 2 of Item 5b.

Operators may report doing batch or continuous flow drying in a bin; the key to deciding how to record it is the description of the facility. If it's done in a bin, it should be considered bin drying.

**Item 5a      Main drying method using heat**  
**Column 3**

For drying facilities that use heat, determine the main drying method used: HIGH TEMP (code 1) or LOW TEMP (code 2). These methods are defined above in the general instructions for Item 5.

If more than one heating method was used, select the method used to dry by heating most of the corn from the selected field.

**Item 5      Number of facilities used**  
**Column 4**

Record the number of facilities of the type recorded in column 2 which were used to dry corn from the entire 1996 crop, that is, corn grown in any field for the 1996 crop. This should be the total number of facilities that are part of the total drying system.

If a facility was used to both dry with heat and to cool/aerate the grain, Item 5a should be completed for use of the facility to dry with heat, and 5b should exclude that facility. For example, if a bin is used to dry corn and then to cool the corn, report it only once for drying and omit this bin on line 5b for cooling. Report other bins used for cooling. That is, count each facility only once.

Usually operators have only one continuous flow or batch dryer, but they may have and use several bins, especially for cooling or aeration drying.

**Item 5      Total holding capacity**  
**Column 5**

Record the TOTAL holding capacity (in bushels) for the total number of driers reported in Column 4. If two or more dryers were used, sum the holding capacities of each dryer. For example, if 3 bins were used for drying with heat, each with a 10,000 bushel capacity, report 30,000 bushels as the total capacity in Column 5 of Item 5a. Report the one-time holding capacity of bin, continuous flow, or batch dryers, not the continuous drying capacity.

**Item 5      Power Source**  
**Column 6**

Record the fuel or power source for the heat used to dry the corn if high temperature or low temperature drying was reported in column 2. Do not report the power source for cooling or aeration.

If more than one power source was used, probe for the main one that dried the most bushels of corn from the 1996 crop.

**Item 6      Bin stirrators or recirculators**

Ask Item 6 only if bin systems were used to dry or aerate the grain (Column 2 of Item 5 is code 1). Record the number of the bins reported in Items 5a and 5b that were equipped with stirrator or recirculator systems. These systems include any type of facilities that move grain around inside the bin during drying and/or aeration in order to more evenly dry the grain.

**Item 7      Corn as a percent of all crops dried**

Operators may use their drying facilities to dry crops other than corn, such as sorghum(milo) or soybeans. The information obtained from this item will be used to determine the share of the total cost of the facility which should be allocated to the corn enterprise.

For this item, the total bushels of all crops which were dried in the facilities should be considered, including crops dried for your operation, other operations, and landlords. Record the percent of this total number of bushels dried that were corn. If no other crop was dried using the facilities, enter 100.

**NOTES**

## **SECTION K - VEHICLES AND TRUCKS- ENTERPRISE**

**Version 2: Corn Production Practices & Costs Report**

**Version 3: Flue-cured Tobacco Production Practices & Costs Report**

### **What's this Section for? How is the information used?**

With the exception of the land, a farm or ranch operator has more money invested in machinery and equipment than in any other input. An operator also spends more time in field work than in any other endeavor. ERS uses the data collected in Section K in two ways. By itemizing the vehicles and trucks, along with the tractors picked up in Section H, we can estimate the amount of capital invested in machinery. These estimates are used in the cost of production budgets in assigning annual costs for "capital replacement" and "other non-land capital." Operators do not pay this amount each year, but when they purchase machinery, they amortize the cost over the life of the machine. ERS estimates a capital replacement and other nonland capital cost based on the total value of the machinery.

### **Item 1 INTRODUCTION**

The introduction to this section is very important to inform the respondent that you are now shifting the frame of reference for obtaining information. Most of the interview has been to ask questions related only to the selected field. Both you and the respondent have become very accustomed to thinking only about the selected field and the various activities and equipment required to produce the corn or flue-cured tobacco on that field.

For the remainder of the interview, you will be obtaining information related to entire corn or flue-cured tobacco enterprise. **Now both you and the respondent must shift gears from thinking about only the selected field to thinking about the entire enterprise.** Inform the respondent that you are done with questions only about the selected field, and that your remaining questions relate to the entire corn or flue-cured tobacco enterprise. It takes only a moment to make this clear to the respondent in the introduction to this section. Otherwise confusion may result that will likely take additional time to clear up or will result in incorrect data being collected.

For CORN, shifting to enterprise-level amounts to only one section of questions about vehicle and truck use. For FLUE-CURED TOBACCO, the remaining three sections will collect data for the entire enterprise on vehicle and truck use, labor, and harvesting and curing methods. The reason for the shift from collecting information about only a selected field to collecting information to the enterprise is because it is difficult for respondents to isolate these items directly to a single field of corn or flue-cured tobacco production .

## VEHICLES TABLE

Count all of the **pick-ups, cars, sport utility vehicles, all-terrain vehicles (ATVs) and motorcycles** owned, leased, rented or borrowed, if they were used for the **any of the 1996 crop, not just those used on the selected field.**

Don't count vehicles used by custom operators. Also exclude vehicles owned by the operation but used **ONLY** for custom work, **ONLY** for other commodities or **ONLY** on other operations. Only count vehicles used for the commodity(corn or flue-cured tobacco) enterprise.

**VEHICLES**                      **Number of pick-ups, cars, sport utility vehicles, ATVs**  
**Column 2**                      **and Motorcycles**

Enter the total number of each type of vehicle used for the COP commodity. Sport utility vehicles are usually four-wheel drive and include such models as Jeeps, Explorers, Broncos, Blazers, etc.

**VEHICLES**    **Total miles driven by these vehicles**  
**Column 3**

Report the total miles driven by all of the vehicles listed on that line **FOR FARM USE** during the last 12 months. Include all mileage driven on farm related business, such as trips to town for parts, visits to offices of USDA's Farm Service Agency (FSA), accountants, etc.

**VEHICLES**    **Percent for commodity**  
**Column 4**

Record the operator's best estimate of the percent of the total miles driven that was for the commodity (corn or flue-cured tobacco) enterprise.

## TRUCKS TABLE

Include trucks that were owned, rented, leased or borrowed by the operation and used for **any of the 1996 crop, not just for the selected field.** Trucks owned in partnership should also be included. Don't count trucks used by custom operators.

Also don't count trucks owned by the operation which were **ONLY** used for custom work, **ONLY** used for other commodities or **ONLY** used on other operations. Don't list the same truck on more than one line.

Exclude pick-ups and sport utility vehicles.

If more than the available number of lines are needed, use a TRUCKS AND TRACTORS SUPPLEMENT. Copy the identification as it appears on the main questionnaire to the identification box on the supplement and assign supplement code 01, 02, 03, 04, etc. to each page. Use as many supplements as you need.

**TRUCKS    Truck make**  
**Column 1**

Enter the make of each truck. You must account for all trucks used for the production of the 1996 corn or flue-cured tobacco crop. It may be easier to start with the smallest truck and go to the largest. Exclude pickups and sport utility vehicles; they should be recorded in the table at the top of the page.

**TRUCKS    Fuel type**  
**Column 2**

Enter the code for the type of fuel used:

- Code 1 - DIESEL
- Code 2 - GASOLINE
- Code 3 - LP GAS (liquefied petroleum or propane)
- Code 9 - OTHER

In many states, products sold as gasoline contain ethanol. For the purposes of this survey, if the product is sold as gasoline or gasohol, record it as gasoline (code 2). If the fuel used for the tractor is ethanol or mostly ethanol, use code 9.

**TRUCKS    Size**  
**Column 3**

Enter the size code for each truck:

Code 1 - SINGLE AXLE  
Code 2 - TANDEM AXLE  
Code 3 - SEMI

**TRUCKS    Total miles for farm use**  
**Column 4**

For each of the trucks listed, record the operator's best estimate of the total number of miles driven during the last 12 months for all farm-related purposes. Don't include mileage driven for operations other than the selected operation.

**TRUCKS    Percent for commodity**  
**Column 5**

Record the operator's best estimate of the percentage of all farm-use miles driven (recorded in Column 4) which were for the commodity (corn or flue-cured tobacco) enterprise.

## **SECTION L - TOBACCO LABOR -- ENTERPRISE**

### **Version 3: Flue-Cured Tobacco Production Practices & Costs Report**

#### **What's this Section for? How is the information used?**

Labor is often one of the most expensive inputs in agriculture. There are several types of labor. Operators are usually the primary workers and they seldom pay themselves a wage; their wages are what is left over at the end of the season when the crop is sold and expenses have been paid. However, this unpaid labor has a value and is listed as a separate cost in the cost of production budget. Family members are often included in this unpaid labor expense. The farmer can also hire full or part-time employees and pay them a wage and/or benefits. Any combination of these labor arrangements may be present on the farm and costs are split between paid and unpaid labor.

#### **Item 1 Labor on flue-cured tobacco**

The purpose of this item is to collect data on labor used on the entire 1996 flue-cured tobacco crop. This includes work in greenhouses, plant beds, and/or float beds, fieldwork, harvesting, hauling, curing, etc. done to produce the 1996 flue-cured tobacco crop. We're interested in work done during three different periods described in Columns 5, 6, and 7. Include work done by the operator, partners, the operator's spouse, and all other paid or unpaid labor. Include all work done in these periods, not just greenhouse, bed, or field work. Include time spent on bookkeeping, parts-running, marketing, management, and other oversight activities. The descriptions are used just to remind the operator of the things that were happening during each of the three periods.

Note that labor done on the 1996 flue-cured tobacco crop may have been performed in 1996 or in 1995.

The procedure used in Item 1 to collect labor hours is to ask the operator to identify and list all the workers that worked on flue-cured tobacco, and then ask how many hours each worker or each group of workers spent doing various activities to produce the 1996 crop. This procedure is called a roster. It was developed because, in past surveys, many enumerators tended to use a procedure like this to add up labor hours for various types of workers. We developed the roster for this survey so that all enumerators could take advantage of the same method that already was working well for some enumerators.

Complete Item 1 by listing all workers in Column 1 first, and then complete Columns 2-7 for each worker or group of workers reported in Column 1.

#### **Item 1 Workers**

### Column 1

Begin by listing all workers, both paid and unpaid, who provided labor to produce the 1996 flue-cured tobacco crop.

If the operator, partners, or the operator's spouse worked on the selected field, check the check-boxes in Column 1 and continue.

List workers using whatever identifier is comfortable for the respondent. If names are used, record first names only. Workers may be identified by their relation to the operator or by the type of work they do. For example, the operator may identify a daughter, a grandson, a hired hand, a group of 8 migrant laborers, and the tractor driver as workers on the field.

If several workers of the same type were used, they may be grouped and listed on a single line. Workers may be grouped in any manner convenient for the respondent. For example, the respondent may group workers by type of work, such as all workers that transplanted flue-cured tobacco plants.

Data recorded in Columns 3 and 4 must be the same for all workers grouped together. For example, a paid full-time worker should be listed on a separate line from a group of paid seasonal workers. Also, if the same worker routinely worked both paid and unpaid hours, record these on separate lines.

Be sure to include ALL workers that worked to produce the 1996 flue-cured tobacco crop. Probe to include workers who worked during the fall of 1995 to prepare for the 1996 crop, or earlier if any acreage was left fallow during 1995. **Exclude contract or custom labor.**

After completing the list of all workers in Column 1, proceed to complete Columns 2-7 of the table for each worker or group of workers listed. It is important to identify all workers in Column 1 first before asking additional questions, because the respondent may decide to leave out some workers if he/she becomes fatigued by the additional questions you'll be asking.

### Item 1      Number of workers Column 2

Enter the number of workers in the group listed in Column 1. If an individual worker is recorded in Column 1, enter the number "1." If the PARTNERS box in Column 1 is checked, enter only the number of partners that worked on the 1996 flue-cured tobacco crop, which may be different from the total number of partners.

**Item 1      Paid or unpaid worker**  
**Column 3**

Record whether the worker or group of workers listed in Column 1 was:

Code 1 - PAID  
Code 2 - UNPAID.

If the box for the operator's SPOUSE is checked in Column 1, determine if he/she is a PAID or UNPAID worker on the operation.

For PAID workers (code 1), complete Column 4, then continue on to Columns 5, 6, and 7. For UNPAID workers (code 2), skip to Column 5.

**Item 1      Type of worker**  
**Column 4**

If Column 3 is Code 1(PAID), determine whether each PAID worker or group of PAID workers listed in Column 1 is:

Code 1 - FULL TIME  
Code 2 - PART TIME  
Code 3 - SEASONAL.

**Item 1      Hours worked in pre-plant activities**  
**Column 5**

For each worker or group of workers listed in Column 1, obtain the total hours worked in the greenhouses, plant beds, float beds, and doing any pre-plant activities on the fields. Include activities such as tilling, fertilizing, seeding, spraying, weeding, and clipping flue-cured tobacco plants in the greenhouses, plant beds, or float beds. Also include pre-plant field work, such as ground preparation, fertilization, pre-plant chemical and pesticide applications, etc. Also include time spent on bookkeeping, running errands related to the flue-cured tobacco production, management, and other oversight activities.

**Item 1            Hours worked on planting to pre-harvest activities**  
**Column 6**

For each worker or group of workers listed in Column 1, obtain the total hours worked during the planting to pre-harvest period on the flue-cured tobacco fields. Include all activities beginning with transplanting and continuing up to harvest. Include activities such as transplanting, irrigating, fertilizing, spraying, etc. Also include time spent on bookkeeping, parts-running and running other errands, management, and other oversight activities.

**Item 1            Hours worked on harvest to post-harvest activities**  
**Column 7**

For each worker or group of workers listed in Column 1, obtain the total hours worked during the harvest to post-harvest period on the 1996 flue-cured tobacco crop. Include all activities beginning with harvesting and continuing through marketing of the crop. Include activities such as harvesting, priming, hauling, curing, and marketing the 1996 flue-cured tobacco crop. Also include time spent on bookkeeping, parts-running and running other errands, marketing, management, and other oversight activities.

**Item 2            Percent of unpaid work done by those under 16**

Considering the **total hours worked by unpaid workers** on the 1996 flue-cured tobacco crop (Column 1 workers with Code 2 (UNPAID) in Column 3 in Item 1), enter the percent of those hours worked by unpaid workers who were under 16 years old.

We will value unpaid labor hours dedicated to the flue-cured tobacco crop with an appropriate wage rate to estimate the economic cost of unpaid labor. Since younger workers are often paid less than more experienced workers, we want to separate unpaid labor hours for workers under 16 so we can value them with a different wage rate.

## **SECTION M - TOBACCO HARVESTING METHODS AND CURING BARNs**

### **Version 3: Flue-cured Tobacco Production Practices & Costs Report**

#### **What's this Section for? How is the information used?**

Tobacco markets are in transition. Since some traditional auction markets are closing, farmers may sell their tobacco in other market areas, which means that additional cost may be incurred to transport the flue-cured tobacco to the point of first sale. The harvesting method used influences costs through the type of harvesting equipment used and the type and number of laborers. All tobacco is cured. Curing barns are used for this purpose. The costs for curing are included in the cost of production budgets under fuel, repairs, replacement, etc.

#### **Items 1 & 1a          Primary harvesting method**

In Item 1, enter the appropriate code for the primary method this operation used to harvest the 1996 flue-cured tobacco crop.

In Item 1a, enter the appropriate code for any additional method used by this operation to harvest the 1996 flue-cured tobacco crop.

The Harvesting Methods Codes are:

**Code 1 - WALKING PRIMERS:** Workers walk through the field and pull lower stalk leaves. These workers are called "primers." There may be as many as 5 priming in a field. Hand labor is the primary method of harvesting.

**Code 2 - RIDING PRIMERS:** Workers ride on machinery through the field and pull lower stalk leaves. Even though machinery is used, hand labor is the primary method of harvesting.

**Code 3 - ONE-ROW MULTI-PASS HARVESTER:** This is special machinery that is used to harvest flue-cured tobacco. Several passes are made through the field to pick the leaves. Use this code if this equipment is the primary method of harvesting.

**Code 4 - TWO-ROW MULTI-PASS HARVESTER:** This is special machinery that is used to harvest flue-cured tobacco. Several passes are made through the field. Use this code if this equipment is the primary method of harvesting.

**Code 5 - ONCE OVER:** Special machinery and hand labor are used to harvest flue-cured tobacco at one time. The primers or workers go through the field along with the machinery and harvest the leaves at the same time.

**Code 6 - ONE-ROW LAST-OVER:** Special machinery and hand labor are used to harvest flue-cured tobacco, but may go through the field several times. The primers go through the field several times, along with the machinery, and harvest flue-cured tobacco leaves.

### **Items 2 & 2a                      Major curing method**

In Item 2, enter the appropriate code for the major method this operation used to cure the 1996 flue-cured tobacco crop

In Item 2a, enter the appropriate code for any additional method used by this operation to cure the 1996 flue-cured tobacco crop

The Curing Method Preparation Method codes are:

**Code 1 - HAND LOOP or TIE ON STICKS:** Tobacco leaves from a stalk are looped or tied by hand and put on a stick.

**Code 2 - BULK RACK AT BARN:** Tobacco leaves are transported from the field and put in racks at the curing barn.

**Code 3 - BULK RACK IN FIELD:** Tobacco leaves are put in racks at the field and the racks are transported to the curing barns.

**Code 4 - FILL BIG BOXES AT BARN:** Tobacco leaves are transported from the field and put in boxes or bins at the curing barns.

**Code 5 - FILL BIG BOXES IN FIELD:** Tobacco leaves are put in bulk boxes or bins at the field and the boxes are transported from the field to the curing barns.

### **Item 3                      Curing Barns**

This item collects information about the types of barns used to cure flue-cured tobacco in 1996, the number of each type of barn used, and costs associated with their use.

In Column 2, collect information about conventional barns used to cure flue-cured tobacco. Conventional barns are defined here as any barn that is not classified as a bulk barn. It may range from a completely wooden structure to a wood frame with galvanized steel exterior.

In column 3, collect information about bulk barns used to cure flue-cured tobacco.

Complete this table by obtaining all of the information about any conventional barns used in Column 2 first; then proceed to Column 3 and complete the information about any bulk barns used.

**Item 3a      Number of barns used in 1996**

Record the number of each type of curing barn used to cure the 1996 flue-cured tobacco crop.

**Item 3b      Number of times barns were used**

Record the total number of times the barns were used to cure the 1996 flue-cured tobacco crop. Multiply the number of barns reported in Item 3a times the number of times each barn was used.

**Item 3c      Repair, maintenance, or servicing cost for barns**

Record the total cost for repairing, maintaining, and servicing the barns for this operation in 1996. Include landlord's costs.

**Item 3d      Fuel cost for barns**

Record the total fuel cost (LP gas, coal, coke, natural gas, wood, kerosene, diesel) for curing the 1996 flue-cured tobacco crop. Include landlord's costs.

Some operators may know their fuel cost "per barn" for each barn of tobacco cured. In this case, multiply the cost per barn times the number of barns used to obtain the total cost. For example, if the operator reports that the fuel cost was \$200 per bulk barn and that 12 bulk barns were used 3 times each, then the total fuel cost would be  $\$200 \times 12 \times 3 = \$7200$ . Enter 7200 in Column 3 of Item 2d.

**Item 3e Electricity cost for barns**

Record the total electricity cost for curing the 1996 flue-cured tobacco crop. Include landlord's costs.

Just like in Item 3d, some operators may know their electricity cost "per barn" for each barn of tobacco cured. In this case, multiply the cost per barn times the number of barns used to obtain the total cost. For example, if the operator reports that the electricity cost was \$50 per bulk barn and that 8 bulk barns were used 4 times each, then the total fuel cost would be  $\$50 \times 8 \times 4 = \$1600$ . Enter 1600 in Column 3 of Item 2d.

**Item 4 Number of rack barns**

Determine the number of the bulk barns used that were rack barns. Rack barns are bulk barns where the tobacco leaves are put in racks which are placed in the bulk barns to be cured.

**Item 4a Number of racks per barn**

Record the average number of racks which were used per barn in 1996.

**Item 5 Number of big box barns**

Determine the number of the bulk barns used in 1996 that were big box barns. Big box or bin barns are bulk barns where the tobacco leaves are put in boxes or bins which are placed in the bulk barns to be cured.

**Item 5a Number of big boxes per barn**

Record the average number of boxes or bins used per barn in 1996.

**Item 6 Bulk barn purchases**

Record the last two digits of the year that this operation last purchased bulk barns. For example, if the operation last purchased bulk barns in 1992, enter 92 in Item 6.

Complete the Item 6 table for NEW barns (Column 1) and for USED barns (Column 2) purchased that year.

**Items 6a & 6b                      Number of bulk barn purchased**

In Column 2 of Item 6a, record the number of NEW bulk barns purchased that year, and enter the average cost per NEW barn in Item 6b.

In Column 3 of Item 6a, record the number of USED bulk barns purchased that year, and enter the average cost per barn in Item 6b.

**Item 7                                      Cost for leasing barns**

If the operator rented or leased additional barns, regardless of type (bulk or conventional), to cure the 1996 crop, record the total cost in Item 7.

**Items 8, 8a, 8b, & 8c              Other structures used for curing**

Determine if any other structures (temporary or permanent) were used by this operation in 1996 to cure or store flue-cured tobacco. If other structures were used, continue with Items 8a, 8b, and 8c. If no other structures were used, go to Item 9.

In Item 8a, record the total number of other structures used to cure or store the 1996 flue-cured tobacco crop.

In Item 8b, record the total size in square feet of all other structures counted in Item 8a.

For the other structures counted in Item 8a, record in Item 8c the number of years, on average, since these structures were built or remodeled. If it has been longer than 30 years since these structures were built or remodeled, enter code 99.

**Item 9                                      Cost of curing chemicals**

Record the TOTAL cost of all curing chemicals used to cure the 1996 flue-cured tobacco crop. Include fumigants, curing chemicals, coloring agents, and all other chemicals used in curing. Include landlord's costs.

**Item 10 & 10a      Wagons and trailers used in 1996**

In Item 10, record the number of wagons used for any hauling of the 1996 flue-cured tobacco crop. In Item 10a, record the number of trailers used any hauling of the 1996 flue-cured tobacco crop. Include wagons or carts used in 1996 to haul plants for transplanting or to haul tobacco to barns, storage, or market.

**Item 11 & 11a      Average miles to haul tobacco to market**

In Item 11, record the average one-way mileage the farmer traveled to haul the 1996 flue-cured tobacco to the market. In Item 11a, record the total number of trips to haul the flue-cured tobacco to the market.

Flue-cured tobacco auction markets in different locations open and close at different times during the harvest period. Farmers sometimes are able to take advantage of price differentials, poundage limitations, and timing of sales, if they can market their flue-cured tobacco in another auction market. Another reason to market their flue-cured tobacco in different areas is that markets are closing. The farmer may have to go to another auction market because there is no local market. When farmers sell their tobacco in other market areas, additional cost may be incurred to transport the flue-cured tobacco to the point of first sale. Items 11 and 11a are collected in order to determine the extent costs differ for this reason.

## VERSION 4: COW-CALF PRODUCTION PRACTICES AND COSTS REPORT

### General Information

- 1) Report information for the beef cow-calf operation only. The beef cow-calf operation includes all beef cattle and calves on the operation up until cattle are sold or otherwise moved to a feedlot for finishing to slaughter. This includes yearling and stocker cattle retained after weaning or purchased to be backgrounded. Backgrounded cattle are weaned calves, typically yearlings or stockers, that are retained either on pasture or on feedlots until being sold to or placed on an operation that finishes the cattle for slaughter. **Exclude all feedlot cattle being finished for slaughter unless the questionnaire specifically asks about them.** Exclude cattle not raised for the purpose of producing beef, such as dairy cattle raised for the purpose of producing milk. Include all cattle raised for the purpose of beef regardless of breed.
  
- 2) Include all beef cattle (located on the total acres operated by this operation) that were owned by the operation or placed on this operation under contract or a similar arrangement, such as cattle on shares. Include cattle owned by this operation that were on public grazing land or on another operation as part of a grazing association. Exclude any cattle on this operation not owned by the operation or not placed on the operation under contract. If this operation is a contractor or has cattle placed on other operations under shares, exclude the cattle placed on other operations.  
  
For example, a respondent's cattle grazing on another operation as part of a grazing association should be included. Another producer's cattle being grazed on a respondent's operation under a grazing association should be excluded.
  
- 3) Exclude information about costs, machinery and all other inputs used to **produce feed** for the beef cow-calf operation. This includes, but is not limited to, information about hay and other harvested forage production, pasture renovation and maintenance, and feed grain production.

- 4) All questions in this questionnaire refer to the time period of the **“last 12 months.”** In order to take advantage of the same survey schedule being used for the ARMS crops versions, the former FCRS lengthy interview was split into two parts to reduce burden and fatigue on respondents and interviewers. Many of the questions are about the production practices used to produce the calf crop and the “last 12 month” period covers a full production cycle. By “last 12 months”, we mean the last 12 **full** months, not from a specific day exactly one year ago today’s date. For example, if the date of the interview is November 20, 1996, then the last 12 month reference period is November 1, 1995 through October 31, 1996.

## **SECTION N - STOCK FLOW AND INVENTORY**

### **What's this Section for? How is this information used?**

This section determines if this operation has a cow-calf operation that should be included in the survey. It collects information about calving and weaning on the cow-calf operation that can be used to measure reproductive performance of the operation. Information collected in this section about the beef cattle inventory on the operation can be used to examine changes that occurred during the last 12 months.

Much of this section is used to collect information about the reproductive performance of the cow-calf operation. Reproductive performance is the ability of the herd to produce a healthy, sound, uniform calf crop. The ability of the cow herd to produce healthy calves and to care for them until weaning is the most important factor determining costs and returns of the operation. Calving percentage, calf death loss, calving distribution, weaning percentage and weaning weight and age are all indicators of reproductive performance. This and other information collected in this section will be used to explain why some cow-calf operation have lower production costs and earn greater returns than others.

The information about cattle inventories collected in this section is needed to determine how the cattle operation changed during the last 12 months. Some cattle operations may have had high returns relative to inputs used because they were selling down the cattle inventory. Likewise, some operations may have had low returns relative to inputs used because they were expanding the operation. In order to compare the costs and returns of all cattle operations, we need to be able to adjust for inventory changes, especially during years of extreme price or forage conditions when major inventory adjustments are common.

### **Item 1      Number of weaned calves**

Determine the number of calves weaned, or to be weaned, by this operation in 1996. If the number of weaned calves is less than 10, review the information on the Screening Report inserted into the questionnaire by the State office, make notes, then go to the Conclusion on the back page; this operation should not be included in the survey. Information collected during the Screening Survey may be used to verify whether the response to this question is correct or to determine reasons for differences.

There are many good, logical reasons why the Item 1 calves weaned may be different from the Screening Survey. The information on the Screening Report will be useful to you for determining a likely reason for any differences.

For example, the respondent to the Screening Survey may have been a different person from the respondent you are interviewing for the Production Practices and Costs Report. Or the Screening number of calves weaned may have included intended purchases that were not actually purchased. Don't assume that something is wrong. It may not be wrong, just different. You may tell the operator your notes from the Screening Survey conducted in July and August show the operation with "X" calves weaned, and ask the operator to explain the difference. Make a note of the explanation on the questionnaire, or make corrections to Item 1 calves weaned, if necessary.

### **Items 2a & 2b      Weaning age and weight**

In Item 2a, record the average age at which the calves reported in Item 1 were weaned, or will be weaned before the end of 1996. Age can be reported as either the number of months or days from calving to weaning. In Item 2b, record the average calf weight at weaning in pounds. The average should include all calves reported in Item 1, including bull, steer and heifer weaned calves.

### **Item 3            Implanted calves**

Record the number (or percent) of the weaned calves reported in Item 1 that were, or will be, implanted with growth implants before the end of 1996. Growth implants are compounds injected or grafted into body tissue. Typically, heifers or bulls that will be saved for breeding will not receive growth implants.

### **Item 4            Calving season**

This question determines whether the operation has one set calving season, two seasons or no set season. The number of calving seasons is determined by how many times the cows are exposed to bulls.

Throughout the U.S., most cow-calf production is done using a single calving season during the spring. In most northern States this is the only practical time for calving so that calves can be sold before winter or will be strong enough to endure winter conditions. In the more temperate conditions of southern States, calving during the fall season is possible and has certain advantages. In order to spread production and labor requirements more evenly throughout the year, some cattle producers maintain both spring and fall calving herds. A few operations don't use a set calving season; rather they allow the cattle to breed and have calves throughout the year.

If the operation has two seasons, or no set season, skip to Item 10. If the operation has one set season, continue.

**Item 5      Date first of weaned calves born**

Record the month, day and year on which the first of the Item 1 weaned calves was born. Record month, day and year, in digits. For example, May 8, 1996, will be entered as 5 08 96.

**Item 6      Beef cows and bred heifers on hand to produce calf crop**

This question identifies all beef cows and bred heifers used to produce the weaned calf crop reported in Item 1. Include all bred cows and heifers that were kept for the purpose of calving during this calving period and were on hand when calving started. Exclude heifers that were not old enough to calve during the calving period and cows or heifers that were bred and sold or died before the start of the calving period.

**Item 7      Composition of breeding herd**

The purpose of this question is to identify the source of the cows and heifers added to the herd for this calving period. This information is used to compute a herd replacement rate and to estimate capital costs of herd replacement.

**Item 7a      Purchased replacement heifers**

Include replacement heifers purchased, either open or bred, that were to calve for the first time during this calving period.

**Item 7b      Replacement heifers raised on operation**

Include replacement heifers raised on this operation that were to calve for the first time during this calving period.

**Item 7c      Replacement cows purchased to calve this year**

Include cows that were either open or bred purchased to calve during this calving period.

**Item 8      Number of calves born alive**

Record the number of calves born alive during the calving period to the cows and heifers reported in Item 6. Include calves that later died from disease, accidents, exposure or which were killed by predators or destroyed for economic reasons. Exclude stillborn calves.

**Items 9a, 9b, 9c & 9d      Distribution of calving**

Record the number (or percent) of calves born alive during each of the four time periods.

In Item 9a, enter the number (or percent) of calves born alive during the first 3 weeks (21 days) of the calving period.

In Item 9b, enter the number (or percent) of calves born alive during the 4th through the 6th week (22-42 days) of the calving period.

In Item 9c, enter the number (or percent) of calves born alive during the 7th through the 9th week (43-63 days) of the calving period.

In Item 9d, enter the number (or percent) of calves born alive after the 9th week (64 or more days) of the calving period.

If percents are reported, make sure the total adds to 100 percent. If head are reported, make sure the total equals the figure reported in Item 8.

**Item 10      Calf deaths**

Record the number of calves that died due to any reason during the last 12 months.

If one set calving season was used, this will be the number of calves born alive (reported in Item 8) that died before weaning. The number of calves born alive (Item 8) minus the number of calf deaths (reported in Item 10) should be equal to or greater than the total number of weaned calves entered in Item 1.

**Item 11      Death or loss of breeding stock**

Record the number of **breeding** stock, including bulls, cows and replacement heifers (more than a year of age), that died or were lost from all causes during the last 12 months. Include cattle that died from or were lost to--

- ! digestive problems (*such as bloat, scours or parasites*)
- ! respiratory problems (*such as pneumonia or shipping fever*)
- ! weather-related causes (*such as lightning, drowning or chilling*)
- ! calving problems
- ! poisoning (*such as nitrates, fescue, noxious weeds, feed*)
- ! predators
- ! theft
- ! other **known** causes (*such as lameness or old age*)
- ! **unknown** causes.

**Item 12 Beef cattle inventory**  
**Columns 2 & 3**

For each type of beef cattle, record the number on hand today in Column 2 and the number on hand 12 months ago in Column 3. Complete Column 2 first and then complete Column 3. Respondents will likely have an easier time answering Column 2. If Column 3 is difficult to answer, ask the respondent whether the beef cattle operation was expanding, contracting or unchanged from a year ago. Complete Column 3 based on the changes made since last year.

**Item 12a Beef replacement heifers**

Include both raised and purchased beef heifers that will be used to add to or replace cows in the beef breeding cow inventory. Include open heifers only; report bred heifers in Item 12b. Exclude heifers used for milk production. Exclude heifer calves weighing less than 500 pounds. These should be recorded as calves in Item 12e.

**Item 12b Beef (breeding) cows**

Include beef cattle, regardless of breed, that have had at least one calf, or have been bred for their first calf, and are not used primarily for milk production. Exclude cattle kept primarily to produce milk for home use or sale.

**Item 12c Beef breeding bulls**

Include all beef bulls weighing 500 pounds or more, regardless of breed. Include bulls used or to be sold for breeding stock. Exclude bull calves weighing less than 500 pounds; these should be recorded as calves in Item 12e.

**Item 12d Feedlot cattle intended for slaughter**

Include all cattle being finished for slaughter. These are primarily steers and heifers in feedlots intended for slaughter, but may include cows or bulls being fattened for slaughter. Exclude calves being backgrounded on feedlots that will be sold before being fed out for slaughter. Include cattle owned by other operations that were placed in this operation's feedlot under contract. Exclude cattle owned by this operation that were placed in someone else's feedlot under contract.

**Item 12e Beef calves less than 500 pounds**

Include heifer, steer and bull calves weighing less than 500 pounds. Exclude calves being raised for milk production.

**Item 12f Beef calves, yearlings or stockers 500 pounds or more**

Include beef calves, yearlings or stockers weighing 500 pounds or more. Yearlings and stockers are weaned calves at least one year old that are being kept on hand to be sold or moved to feedlots at a later date. Exclude calves being raised for milk production. Make sure no cattle are duplicated here with those reported in earlier categories.

**Item 12g Total**

Sum and verify the totals of each column with the respondent. If the total is incorrect, go back to the individual items and make adjustments as necessary.

## **SECTION O - CONTRACT PLACEMENTS AND REMOVALS**

### **What's this Section for? How is this information used?**

The purpose of this section is to collect information on special operating arrangements being used to produce cattle on this operation. These are production contracts, and include situations in which beef cattle are produced in a share arrangement. In a production contract, the operator does not own the cattle being produced and receives a fee for raising them that reflects only a portion of their value. The use of production contracts is a way to reduce financial risk.

This information is used to examine the extent to which these special operating arrangements are used for beef cow-calf production. Information collected in this section is also used, along with purchases, sales and inventories, to indicate changes in the organization of the beef cow-calf operation during the last 12 months. Costs and returns of beef cow-calf production can vary significantly depending on whether the operation was expanding, contracting or stable during the production period.

### **Item 1      Screening**

In nearly all cases of production contracts, the operation will be a contractee. The contractee does not own the cattle being produced but gets paid a fee for raising them.

Include cattle placed on this operation by contractors (cattle owners) in Item 2 and cattle removed from this operation by contractors in Item 3. Do not record marketing contracts in this section. Marketing contracts are contracts for marketing this operation's owned cattle. Treat marketing contracts as sales and record the information in Section P.

Use this section to record information about arrangements to produce "cattle on shares". These arrangements are considered production contracts for this survey. Typically a cattle owner (contractor) will place cows on an operation with extra or unused grazing land and the land owner (contractee) will receive a share of the calves as the fee for grazing the cattle. In this situation, record cattle as being placed on the operation, and record the cattle owner's share of the calves as removals if they are removed from the operation. Record the land owner's share of the calves as sales in Section P if they are sold from the operation.

As an example, consider an operator with 100 beef cows placed on the operation during the last 12 months, under a "cattle-on-shares" arrangement. The 100 beef cows would be entered as placements in Item 2d of Section O.

Let's say the 100 beef cows produced 90 weaned calves and that the arrangement was for the operator to receive 50 percent of the weaned calf crop, with all calves sold at weaning. The 45 calves received by the operator would be entered in Item 2 of Section P in the appropriate sale categories. The other 45 calves, property of the person who placed the cows on the operation, would be entered in Item 3 of Section O in the appropriate removal categories. (Note: In this example, if the 100 cows had been placed on the operation in a previous year and remained on the operation throughout the 12-month survey period, they would have been reported as inventory in Item 12 of Section N and not as placements. Similarly, if the 90 calves had not yet been removed or sold at the time of the survey, they would have appeared as inventory and not as removals or sales.)

If the operation is a **contractor**, cattle removed from this operation and placed to be raised on a contractee's operation should be recorded in Item 3. Exclude all costs and related information in other sections of the questionnaire about the cattle placed on other operations.

**Item 2      Beef cattle placements**  
**Columns 2 & 3**

In Column 2, record the number of cattle **placed under contract** on the operation during the last 12 months. In Column 3, record the average placement weight per head in pounds. Record placement weight only in Items 2a and 2b.

**Item 2a      Cattle for finishing**

Record the number and average weight of cattle placed on this operation with the intent of being finished to slaughter. These are primarily steers and heifers in feedlots intended for slaughter, but may include cows or bulls to be fattened for slaughter.

**Item 2b      Cattle for backgrounding**

Record the number and average weight for cattle placed on this operation to be backgrounded. Backgrounded cattle are weaned calves, typically yearlings or stockers, that are retained either on pasture or on feedlots until being sold to or placed on an operation that finishes the cattle for slaughter.

**Item 2c      Cow-calf pairs**

Record the number of cow-calf pairs placed under contract on this operation. Count each pair only once.

**Item 2d      Cows and replacement heifers for breeding stock**

Record the number of cows and replacement heifers placed on this operation to be used as breeding stock. These cattle may be open or bred.

**Item 2e      Bulls for breeding stock**

Record the number of bulls placed on this operation to be used as breeding stock.

**Item 3      Beef cattle removals**  
**Columns 2 & 3**

In Column 2, record the number of cattle **removed under contract** from this operation during the last 12 months. In Column 3, record the average removal weight per head in pounds. Record removal weight only in Items 3a, 3b, 3c, 3d, 3e, 3f and 3g.

If the operation is a **contractor**, cattle removed from this operation and placed to be raised on a contractee's operation should be included here in Item 3.

**Item 3a      Finished cattle**

Record the number and average weight of finished cattle removed from this operation's feedlots to be slaughtered. These are primarily steers and heifers in feedlots, but may include cows or bulls fattened for slaughter.

**Item 3b      Cull bulls**

Record the number and average weight of cull bulls removed from this operation under contract. These cattle are most often taken directly to slaughter, but may be placed on another operation to be fattened before slaughter. Exclude cattle here that will be used as breeding stock on another operation.

**Item 3c Cull cows**

Record the number and average weight of cull cows removed from this operation under contract. These cattle are most often taken directly to slaughter, but may be placed on another operation to be fattened before slaughter. Exclude cattle here that will be used as breeding stock on another operation.

**Item 3d Steer calves less than 1 year old**

Record the number and average weight of weaned steer calves less than one year old that were removed from this operation under contract.

**Item 3e Heifer calves less than 1 year old**

Record the number and average weight of weaned heifer calves less than one year old that were removed from this operation under contract.

**Item 3f Stocker or yearling steers**

Record the number and average weight of stocker or yearling steers one year or more of age removed from this operation under contract. Yearlings and stockers are weaned calves at least one year old that are being kept on hand before being sold or moved to feedlots.

**Item 3g Stocker or yearling heifers**

Record the number and average weight of stocker or yearling heifers one year or more of age removed from this operation under contract.

**Item 3h Cow-calf pairs**

Record the number of cow-calf pairs removed from this operation under contract. Count each pair only once.

**Item 3i      Cows and replacement heifers for breeding**

Record the number of cows and replacement heifers removed from this operation under contract to be used as breeding stock on another operation. These cattle may be open or bred.

**Item 3j      Bulls for breeding**

Record the number of bulls removed from this operation under contract to be used as breeding stock on another operation.

**NOTES**

## **SECTION P - PURCHASES AND SALES**

### **What's this Section for? How is this information used?**

The purpose of this section is to collect information on cattle market transactions. This information is used to estimate the returns to beef cow-calf production.

Information collected in this section is also used, along with contract placements and removals and inventories, to indicate changes in the organization of the beef cow-calf operation during the last 12 months. Costs and returns of beef cow-calf production can vary significantly depending on whether the operation was expanding, contracting or stable during the production period.

### **Item 1      Beef cattle purchases** **Columns 2, 3 & 4**

In Column 2, record the number of cattle purchased by this operation during the last 12 months. In Column 3, enter the total dollar amount paid for these cattle purchases, and, in Column 4, record the average purchase weight per head in pounds. Record purchase weight only in Items 1a and 1b.

### **Item 1a      Cattle for finishing**

Record the number, amount paid and average weight of cattle purchased by this operation with the intent of being finished to slaughter. These are primarily steers and heifers in feedlots intended for slaughter, but may include cows or bulls to be fattened for slaughter.

### **Item 1b      Cattle for backgrounding**

Record the number, amount paid and average weight of cattle purchased by this operation to be backgrounded. Backgrounded cattle refers to weaned calves, typically yearlings or stockers, that are retained either on pasture or on feedlots until being sold to or placed on an operation that finishes the cattle to slaughter.

**Item 1c      Cow-calf pairs**

Record the number and amount paid for cow-calf pairs purchased by this operation. Count each pair only once.

**Item 1d      Cows and replacement heifers for breeding stock**

Record the number and amount paid for cows and replacement heifers purchased by this operation to be used as breeding stock. These cattle may be open or bred when purchased.

**Item 1e      Bulls for breeding stock**

Record the number and amount paid for bulls purchased by this operation to be used as breeding stock.

**Item 2      Beef cattle sales**  
**Columns 2, 3 & 4**

In Column 2, record the number of cattle sold by this operation during the last 12 months. In Column 3, enter the total dollar amount received for these cattle sales, and, in Column 4, record the average sale weight per head in pounds. The dollar amount received should be the amount received after marketing charges (commissions, check-offs, etc.) have been deducted. Record average sale weight only in Items 2a, 2b, 2c, 2d, 2e, 2f and 2g.

**Item 2a      Finished cattle**

Record the number, amount received and average weight of fattened cattle sold by this operation to be slaughtered. These are primarily steers and heifers in feedlots intended for slaughter, but may include cows or bulls being fattened for slaughter.

**Item 2b      Cull bulls**

Record the number, amount received and average weight of cull bulls sold by this operation. These cattle are most often taken directly to slaughter, but may be purchased by another operation to be fattened before slaughter. Exclude cattle here that will be used as breeding stock on another operation.

**Item 2c      Cull cows**

Record the number, amount received and average weight of cull cows sold by this operation. These cattle are most often taken directly to slaughter, but may be purchased by another operation to be fattened before slaughter. Exclude cattle here that will be used as breeding stock on another operation.

**Item 2d      Steer calves less than 1 year old**

Record the number, amount received and average weight of weaned steer calves less than one year old that were sold by this operation.

**Item 2e      Heifer calves less than 1 year old**

Record the number, amount received and average weight of weaned heifer calves less than one year old that were sold by this operation.

**Item 2f      Stocker or yearling steers**

Record the number, amount received and average weight of stocker or yearling steers one year or more of age sold by this operation. Yearlings and stockers are weaned calves at least one year old that are being kept on hand before being sold or moved to feedlots.

**Item 2g      Stocker or yearling heifers**

Record the number, amount received and average weight of stocker or yearling heifers one year or more of age sold by this operation.

**Item 2h      Cow-calf pairs**

Record the number and amount received for cow-calf pairs sold by this operation. Count each pair only once.

**Item 2i      Cows and replacement heifers for breeding**

Record the number and amount received for cows and replacement heifers sold by this operation to be used as breeding stock on another operation. These cattle may be open or bred.

**Item 2j      Bulls for breeding**

Record the number and amount received for bulls sold by this operation to be used as breeding stock on another operation.

## SECTION Q - GRAZED FEED

### What's this Section for? How is this information used?

The purpose of this section is to collect data on the acreages of range and pasture used to graze the beef cow-calf herd during the last 12 months. The cost of land for grazing is the single largest variable cost of beef cow-calf production, accounting for about one-fourth of total variable cost. Therefore, it is very important to get detailed information on the amounts and types of range and pasture used for beef cow-calf production.

This section is also used to collect data about pesticide use on range and pasture acreage. This pesticide data is used, along with that collected in crops versions of ARMS, to estimate pesticide use on U.S. farms and ranches.

Include all acres grazed by beef cattle during the last 12 months, regardless of how long the cattle grazed the pastures. Include only the acreage that is suitable for grazing. Exclude land in mountains, lakes, rivers, etc. that may be part of the range or pasture land.

### Item 1      Public grazing land

Determine if any public land was grazed by the beef cattle during the last 12 months. Ask the respondent to look at the Respondent Booklet and identify the types of public grazing land used by this operation. If any public grazing land was used, check YES and complete the Public Grazing Table. If none was used, check NO and go to Item 2.

### Item 1      Type of grazing land Column 1

Record all types of public land that were grazed by the beef cattle during the last 12 months. Complete all of Column 1 before completing the rest of the table; that is, FIRST list all the types of public land being used by the operation. Then, proceed to fill out the rest of the row for each type of public land entered in Column 1. The codes for Public Land are:

**Code 1 - STATE LAND:** All land managed by State government(s) and leased or rented for grazing beef cattle.

**Code 2 - BUREAU OF LAND MANAGEMENT (BLM):** The Bureau of Land Management, part of the Department of Interior, and the Forest Service of the Department of Agriculture, administer and manage the great majority of federally-owned lands. The BLM administers about 57 percent of the total 307 million acres of public rangelands and the Forest Service about 43 percent.

Approximately 31,000 grazing permit holders work as partners with the BLM and the Forest Service in managing cattle, sheep, horses and goats on federal lands in 35 states. All operate according to federal leases or permits that control the number of livestock and duration of grazing. About 13 percent of these permit holders use both Forest Service and BLM lands. The public rangelands are divided into more than 30,000 individual grazing units called allotments, ranging in size from less than 40 acres to more than 1 million acres.

A large proportion of the livestock raised in the western states graze at least part of the year on federal land. For example, 88 percent of the cattle produced in Idaho, 64 percent in Wyoming, and 63 percent in Arizona graze on public range at some time. Overall, federal lands produce approximately 13 percent of the grazing forage in the United States.

BLM land falls into two major types:

- 1) Section 3 (of the Grazing Act) Land which is primarily Public Domain land with a few intermingled private lands, and
- 2) Section 15 Land which is mostly private land with a few intermingled public parcels.

Regulations on use and management of BLM lands vary by these classifications, and ranchers will often refer to terms such as Section 3 or Section 15 land when speaking of BLM land.

Users of BLM lands do not have to own their cattle, as they do on FS land. Permits to graze BLM land may be issued on an AUM or per acre basis.

**Code 3 - FOREST SERVICE (FS):** The Forest Service consists of land primarily in large, solid blocks. People wanting to use any National Forest land for grazing must apply for the opportunity, and must own their livestock. The Forest Service issues 10-year term permits and annual permits. Among other things, the permit prescribes the boundaries of the range which they may use, the maximum number of animals allowed and the season when grazing is permitted.

Include all land managed by the National Forest Service, including National Grasslands.

**Code 4 - INDIAN LAND:** Most Indian lands, comprising 51 million acres, are held in trust for the use of and benefit of American Indians and are merely administered by the Bureau of Indian Affairs (BIA) of the Department of Interior. Over 80 percent of Indian lands are in the range area of the

West and are suited primarily to livestock. Seventy-five percent of Indian lands are grazed by livestock owned by Native Americans. Provision for the use of this land is handled under a lease arrangement jointly approved by the Indian owners and BIA.

**Code 5 - RAILROAD LAND:** During the pioneer period, the federal government provided large grants of land to railroads, consisting of alternate 640-acre sections extending in a checkerboard fashion for a distance of 10 to 40 miles on each side of the railroad right-of-way. Today, 20 million acres of these lands are still held by railroads. Many of these holdings are leased to livestock producers. In general, the railroad lease agreements do not restrict the number of stock to be grazed or the season during which the land may be used.

**Code 6 - OTHER FEDERAL LAND:** Federal agencies administering land include USDA's Agricultural Research Service, the Departments of Defense and Energy, Bureau of Reclamation, Fish and Wildlife Service, National Park Service and Corps of Engineers.

**Item 1          Total units leased or rented**  
**Columns 4 & 5**

In Column 4, record the total number of units leased or rented, using whichever unit is most convenient for the respondent. In Column 5, enter the unit code associated with the data in Column 4. The codes for leasing units are:

- Code 1 - ACRE
- Code 2 - AUM (Animal Unit Month)
- Code 3 - HEAD
- Code 4 - COW/CALF PAIR

Most often public land will be rented on an AUM basis. An AUM refers to the amount of forage consumed by one beef cow during one month.

**Item 1          Total rent paid**  
**Column 6**

Record the TOTAL dollars paid in rent during the last 12 months. Do not record rates per AUM or other unit.

If a respondent reports a rate per AUM, head or cow-calf pair, probe for the number of units that the operation paid for. Also, if a respondent reports a monthly rate, multiply this monthly rate times the number of months the land was rented.

For example, a respondent may report paying \$1.36 per AUM. In that case, probe for the number of AUMs and the length of grazing in months. If respondent paid for 100 AUMs for 3 months, then the total rent paid would be  $\$1.36 \times 100 \times 3 = \$408$ .

This item is used to compute the cost of public grazing for beef cow-calf production.

**Item 1          Grazing by other domestic animals**  
**Column 7**

Determine whether any domestic animals other than the operation's beef cattle grazed these range and pasture lands. This includes all other species of domestic animals, such as sheep, horses, llamas, and dairy cattle that grazed this land, as well as beef cattle that are not included as part of this operation. (See General Instructions in Section N for which beef cattle are included as part of this operation.) Exclude nondomestic animals such as deer, elk, moose and bison.

If animals besides the operation's beef cattle grazed these pastures, enter code 1 for YES and continue with Column 8. If no other animals grazed the pastures, put a dash in this item and go to next line of pasture type identified.

**Item 1          Percent of forage consumed**  
**Column 8**

If Column 7 is YES (Code 1), ask Column 8 to determine the percent of the total forage grazed from these range and pasture lands that was consumed by beef cattle from this operation. Consider only the grazed forage, not any forage cut and harvested for hay. If other ruminants, such as sheep or dairy cattle, were grazing with the beef cattle, record the operator's best estimate of the percent of the total forage consumed by all animals that was consumed by the beef cattle. Also, if another operation's beef cattle were grazing the land, such as in a grazing association, or if there were multiple ranchers with permits to this allotment, record the operator's best estimate of the percent of the total forage consumed by all beef cattle that were this operation's beef cattle.

This information is used to allocate the cost of grazing land to the beef cow-calf enterprise on this operation.

**Item 2          Private grazing on range and pasture land**

Determine if any owned or rented range or pasture land was grazed by the beef cattle during the last 12 months. Ask the respondent to look at the Respondent Booklet and identify the types of private pasture land used by this operation. If any pasture land was used, check YES and complete the Private Pasture Table. If none was used, check NO and go to Item 3.

**Item 2      Type of grazing land and forage type**  
**Columns 1 & 2**

Record all types of private range and pasture land that were grazed by the beef cattle during the last 12 months. Private range or pasture land includes grazing land that is not suitable for, or not normally used for, crop production.

Complete Columns 1 and 2 together before completing the rest of the table; that is, **FIRST** list all the types of private pasture land used by the operation and the type of forage. Then, fill out the rest of the row for each type of pasture land and forage entered in Columns 1 and 2.

If a single type of grazed land reported in Column 1 has different primary forage types, each combination of pasture type and forage type must be recorded on separate lines. For example, if a producer has 100 acres of improved pasture, 75 acres with grasses and 25 acres with a grass-legume mixture, record the 75 acres on one line and the 25 acres on another line.

The codes for Private Pasture are:

**Code 7 - UNIMPROVED RANGE LAND:** Land on which the natural vegetation is predominantly grasses, grass-like plants, forbs, or shrubs; including land revegetated naturally or artificially that is managed like native vegetation. Typically rangeland receives little precipitation and has topographic features making it unsuitable for cultivated and irrigated crops.

**Code 8 - IMPROVED RANGE LAND:** Rangeland is considered improved if one or more of the following practices have been used: fertilizing, seeding or irrigation.

**Code 9 - UNIMPROVED PERMANENT OR NATIVE PASTURE LAND:** Permanent pastures are composed of perennial or self-seeding annual grasses or legumes (frequently some combination of these) that are maintained through several years for grazing. A permanent pasture may be a native stand, it may have been seeded or it may be a previously cultivated field taken over by forage plants that were aggressive enough to spread without human assistance.

**Code 10 - IMPROVED PERMANENT OR NATIVE PASTURE LAND:** Pasture is considered improved if one or more of the following practices has been used: fertilizing, seeding, or irrigation.

The codes for Forage Type are:

Code 1 - GRASSES

Code 2 - LEGUMES

Code 3 - GRASS LEGUME MIXTURE

**Item 2      Acreage in pasture**  
**Column 3**

Record the number of acres of the range land or permanent pasture and forage type reported in Columns 1 and 2.

**Item 2      Total units leased or rented**  
**Columns 4 & 5**

In Column 4, record the total number of units leased or rented, in whatever unit is most convenient for the respondent. In Column 5, enter the unit code associated with the data entered in Column 4. The codes for leasing units are:

- Code 1 - ACRE
- Code 2 - AUM (Animal Unit Month)
- Code 3 - HEAD
- Code 4 - COW/CALF PAIR

If the operation owns all its range or pasture grazing land, this item will be dashed to indicate that none was leased or rented.

**Item 2      Total rent paid**  
**Column 6**

If leased or rented acres are reported in Column 4, record the TOTAL dollars paid in rent during the last 12 months. Do not record rates per AUM or other unit. If a respondent reports a rate per AUM, head or cow-calf pair, probe for the number of units paid for by the operation. Also, if a respondent reports a monthly rate, multiply this monthly rate times the number of months during which the land was rented.

For example, a respondent may report paying \$1.28 per Cow/Calf pair. In that case, probe for the number of Cow/Calf Pairs and the length of grazing in months. If respondent paid for 40 Cow/Calf pairs for 2 months, then the total rent paid would be  $\$1.28 \times 40 \times 2 = \$102$ .

This item is used to compute the cost of private grazing on range and permanent pasture land for beef cow-calf production.

**Item 2      Grazing by other domestic animals**  
**Column 7**

Determine whether any domestic animals other than the operation's beef cattle grazed these range and pasture lands. This includes all other species of domestic animals, such as sheep, horses, llamas, and dairy cattle that grazed this land, as well as beef cattle that are not included as part of this operation. (See General Instructions in Section N for which beef cattle are included as part of this operation.) Exclude nondomestic animals such as deer, elk, moose and bison.

If animals besides the operation's beef cattle grazed these pastures, enter code 1 for YES and continue with Column 8. If no other animals grazed the pastures, put a dash in this item and go to next line of pasture type identified in Column 1.

**Item 2          Percent of forage consumed**  
**Column 8**

If Column 7 is YES, ask Item 8 to determine the percent of the total forage grazed from these range and pasture lands that was consumed by beef cattle from this operation. Consider only the grazed forage, not any forage cut and harvested for hay. If other ruminants, such as sheep or dairy cattle, were grazing with the beef cattle, record the operator's best estimate of the percent of the total forage consumed by all animals that was consumed by the beef cattle. Also, if another operation's beef cattle were grazing the land, such as in a grazing association, or if there were multiple ranchers with permits to this allotment, record the operator's best estimate of the percent of the total forage consumed by all beef cattle that were this operation's beef cattle.

This information is used to allocate the cost of grazing land to the beef cow-calf enterprise on this operation.

**Item 3          Private grazing on cropland pasture**

Determine if any owned or rented land suitable for crop production was grazed by the beef cattle during the last 12 months. Ask the respondent to look at the Respondent Booklet and identify the types of cropland pasture used by this operation. If any cropland pasture was used, check YES and complete the Cropland Pasture Table. If none was used, check NO and go to Item 4.

**Item 3          Type of grazing**  
**Columns 1 & 2**

Record all kinds of private cropland pasture that were grazed by the beef cattle during the last 12 months. Private cropland pasture includes grazed land that is suitable for, or may be used for, crop production.

Complete Columns 1 and 2 together before completing the rest of the table; that is, **FIRST** list all the kinds of cropland pasture being used by the operation and the type of forage. Then, proceed to fill out the rest of the row for each type of cropland pasture and forage entered in Columns 1 and 2.

If a single type of cropland pasture reported in Column 1 has different primary forage types, each combination of pasture type and forage type must be recorded on separate lines. For example, if a producer has 100 acres of small grain pasture, 60 acres with grasses and 40 acres with a grass-legume mixture, record 60 on one line and 40 on another line.

In this section, hay is not considered to be a crop. Production of hay on grazed land does not necessarily mean that the land should be counted as cropland pasture. If range or permanent pasture land was hayed before grazing, the land should be counted in Item 2. If land that is suitable for crop production (excluding hay) was hayed before grazing, the land should be counted in Item 3.

The codes for Cropland Pasture are:

**Code 11 - SMALL GRAIN PASTURE:** Include all croplands (either owned by this operation or leased from a landlord) which were not harvested mechanically or by hand prior to grazing by beef cattle. **Exclude** state land, BLM, Forest Service, Indian land, Railroad land and any other federal land. Examples are wheat, oats, rye and ryegrass mixtures.

**Code 12 - CROP RESIDUE:** Include land (either owned by this operation or leased from a landlord) from which a crop was harvested mechanically or by hand and was grazed by the beef herd before or after harvesting. **Exclude** state land, BLM, Forest Service, Indian land, railroad land and any other federal land. Examples are sugarbeet tops, corn stalks, sorghum/milo refuse, soybean refuse, small grain refuse, legume and grass seed straws.

**Code 13 - CONSERVATION RESERVE PROGRAM (CRP):** The CRP is a long-range program administered by the USDA in which operators voluntarily contract to take cropland out of production for 10 to 15 years and devote it to conserving uses. In return, producers receive an annual rental payment for the contract period and assistance for carrying out approved conservation practices on the conservation acreage. Normally, CRP land cannot be used for grazing, but under certain conditions (like drought), approval is granted by USDA for grazing of CRP land.

**Code 14 - OTHER GRAZED FORAGES:** Grazed forages other than range land, private pasture, small grain pasture, crop residues and government program land. Include land owned, rented or leased that cannot be included in other categories.

The codes for Forage Type are:

- Code 1 - GRASSES
- Code 2 - LEGUMES
- Code 3 - GRASS LEGUME MIXTURE
- Code 4 - WHEAT
- Code 5 - OTHER SMALL GRAINS
- Code 6 - CORN STALKS
- Code 7 - OTHER CROP RESIDUES

**Item 3          Acreage in pasture**  
**Column 3**

Record the number of cropland pasture and forage type acres reported in Columns 1 and 2.

**Item 3          Total units leased or rented**  
**Columns 4 & 5**

In Column 4, record the total number of units leased or rented, in whatever form is most convenient for the respondent. In Column 5, enter the unit code associated with the data in Column 4.

The codes for leasing units are:

- Code 1 - ACRE
- Code 2 - AUM
- Code 3 - HEAD
- Code 4 - COW/CALF PAIR

If the operation owns all its cropland pasture, this item will be dashed to indicate that none was leased or rented.

**Item 3          Total rent paid**  
**Column 6**

If leased or rented acres are reported in Column 4, record the TOTAL dollars paid in rent during the last 12 months. Do not record rates per AUM or other unit. If a respondent reports a rate per AUM, head or cow-calf pair, you will have to probe for the number of units that the operation paid for. Also, if a respondent reports a monthly rate, multiply this monthly rate times the number of months during which the land was rented.

For example, a respondent may report paying \$1.28 per Cow/Calf pair. In that case, probe for the number of Cow/Calf Pairs and the length of grazing in months. If respondent paid for 40 Cow/Calf pairs for 2 months, then the total rent paid would be  $\$1.28 \times 40 \times 2 = \$102$ .

This item is used to compute the cost of private grazing on cropland pasture for beef cow-calf production.

**Item 3      Grazing by other domestic animals**  
**Column 7**

Determine whether any domestic animals other than the operation's beef cattle grazed these range and pasture lands. This includes all other species of domestic animals, such as sheep, horses, llamas, and dairy cattle that grazed this land, as well as beef cattle that are not included as part of this operation. (See General Instructions at the beginning of Section N for which beef cattle are included as part of this operation). Exclude nondomestic animals such as deer, elk, moose and bison.

If animals besides the operation's beef cattle grazed these pastures, enter code 1 for YES and continue with Column 8. If no other animals grazed the pastures, go to next line of pasture type identified in Column 1.

**Item 3      Percent of forage consumed**  
**Column 8**

If Column 7 is YES, ask Column 8 to determine the percent of the total forage grazed from these range and pasture lands that was consumed by beef cattle from this operation. Consider only the grazed forage, not any harvested crops. If other ruminants, such as sheep or dairy cattle, were grazing with the beef cattle, record the operator's best estimate of the percent of the total forage consumed by all animals that was consumed by the beef cattle. Also, if another operation's beef cattle were grazing the land, record the operator's best estimate of the percent of the total forage consumed by all beef cattle that were this operation's beef cattle.

This information is used to allocate the cost of grazing land to the beef cow-calf enterprise on this operation.

**Item 4            Chemical use on pastures**

Determine if any pesticides, herbicides, insecticides, fungicides or other chemicals were applied to any of the grazed land reported in Items 1, 2 & 3 during the last 12 months. Include only the chemicals that were **applied by the operation or by a custom operator hired by the operation**. Include spot treatments. Exclude chemicals applied by other operators or by federal, State, or local governments to public grazing land. Exclude chemicals applied to small grains that were produced for grain, as well as wheat used only for pasture. Exclude chemicals used on other crops harvested from crop residue pastures. Exclude chemicals applied to land that was not grazed, such as land for hay only.

Herbicide materials may be applied before weeds emerge or after the weeds have emerged. Herbicides are also sometimes used as a "burndown" to kill weeds prior to planting in no-till systems.

Insecticide materials are applied to control insects that damage plants by feeding on plant tissues.

Fungicides are applied to control disease organisms which infect the growth and development of the plant, such as pod-and-stem blight, anthracnose, brown spot, etc.

If any pesticides were applied, check YES and complete the Pesticide Table. If no chemicals were applied, check NO and go to Section R.

If more than the available number of lines are needed, use a CHEMICAL/PESTICIDE APPLICATIONS SUPPLEMENT. Copy the identification as it appears on the main questionnaire to the identification box on the supplement and assign the next Table Number 02, 03, 04, etc. to each supplement used. Use as many supplements as you need.

**Item 4            Product code**  
**Column 2**

Ask the operator to identify the chemical or pesticide products applied to the pasture or range land. Record the product code for each chemical from the Pesticide Code Lists found in the Respondent Booklet.

Many enumerators also use the NOTES column to the left of the Pesticide Table to record the product name. This makes it easier to refer to the product, by name, while asking the remaining questions in the table. It also makes it easier to identify a product and its code when the same product is reported more than once.

Each product and each application must be recorded on a separate line. If two or more products are applied with a single application (tank mix) a separate line must be used for each product.

### **Use of the Respondent Booklet**

Most of the pesticide products used for grazed land are listed in the Respondent Booklet. It is very important to obtain the trade name as well as the formulation from the operation to insure that the proper product code is recorded. In order to report the formulation and whether the product is liquid or dry, the respondent may have to look at the product label or detailed itemized receipts for the product.

Both you and the respondent should use a Respondent Booklet. These booklets contain product code listings. Some respondents may be willing to use the booklet and to report the product code for each of the products they used. You should encourage this since it makes the job of enumeration easier as well as making reporting faster and more accurate.

To aid in identification, the products in the Respondent Booklet are categorized as LIQUID(L) or DRY(D) formulations. Ask the respondent if the product was in a liquid or dry state when it was purchased. This should help you and the respondent find and record the correct product codes.

The Respondent Booklet also lists the type or class of each product: Herbicide (H), Insecticide (I), Fungicide (F) and Other products (O). Some chemicals and pesticides have more than one use. Some products with more than one use may be listed twice if the second use is associated with a separate product code. For example,

Gramoxone Extra	H	4314
Gramoxone Extra	O	9037

For products that are listed more once, be sure to probe for what it was used for and record the product code associated with that use.

You will note that for each product code listed in the Respondent Booklet the trade name and formulation is specified. The numbers and letters after the product name identify the concentration and form. For example, Canopy 75DF: Canopy is the trade name and the 75DF indicates the formulation. The 75 indicates the concentration as the percent of active ingredient in a pound of product, and the DF indicates that the form of the product is Dry Flowable. For

**Basagran (4L):** Basagran is the trade name and the 4L indicates the formulation. The 4 indicates 4 pounds of active ingredient in a gallon of product and the L indicates a Liquid Concentrate. Common abbreviations for Form of Pesticide Products appear in Exhibit 1 on page 5223.

Also note that for several products there is more than one formulation for a given trade name: Ambush (2EC) and Ambush 25W or Diazinon 14G and Diazinon 4E and Diazinon 50W and Diazinon AG500(4E). Different formulations of a product have different concentrations of the active ingredient and inert materials.

It is extremely important that you get the correct product code because active ingredient concentrations for different products and different formulations vary greatly. Since we summarize by active ingredient in the product, recording a product, or its formulation, incorrectly will make a difference when the active ingredient application rate per acre is calculated. For example, if you record the code for 2,4-D/Weedone LV6 (4299) when you really should have recorded the code for 2,4-D/Weedone LV4 (4298), then we will summarize one and a half times more the amount of active ingredient than we should. That will make it look like operators apply more chemicals to pasture and range land than they actually do.

Also, if you record the 2,4-D/Weedone LV4 code when you really should have recorded the code for 2,4-D/Weedone LV6, we will summarize two-thirds as much active ingredient as we should. This is not good either. We need the correct information listed in the questionnaire.

If you cannot find a reported product in the Pesticide Code List in the Respondent Booklet, write notes that provide the information needed to classify and summarize unlisted products. First record the line number of the pesticide application that the information refers to. Then record what it was used for (herbicide, insecticide, fungicide). Next record the EPA registration number, if it is available, or the name and formulation of the product. Finally, record whether the product was liquid or dry when it was purchased.

The EPA Registration number is printed on the product label. EPA numbers are several digits long and look somewhat like many bank and credit card account numbers, such as 312-19-18713 and 2980-4. EPA Registration numbers are not the same thing as EPA Establishment numbers.

If the respondent does not know the EPA number or the trade name and formulation, record as much information about the product as you can, and try to find out where it was purchased. This information will enable identification of the product in the State Office. Finding out where it was purchased is important because if more information is needed, we can then call the dealer.

**EXHIBIT 1**  
**COMMON ABBREVIATIONS FOR FORM OF PESTICIDE PRODUCTS**

**L (Liquid)**

These products flow like water. Concentrations are usually expressed in pounds per gallon.

**E (EC)**

Emulsifiable concentrates. These are usually thicker than water and are mixed with water and applied as sprays. They contain one or more active ingredients, one or more solvents and an emulsifier. Their concentrations are generally indicated in pounds per gallon.

**F (FL) (Flowable)**

These products are in liquid form. They contain finely ground active ingredients suspended in the liquid. They are mixed with water for application. Their concentrations are indicated in pounds per gallon.

**D (Dust)**

Dusts contain a low percentage of active ingredients on a very fine dry inert carrier such as talc, chalk or clay. They are usually applied directly as purchased. Their concentrations are expressed as percents.

**WP (W), SP (S)**

Wettable or Soluble Powders. These are dry products, much like flour, which will dissolve or disperse in water. Their concentrations are indicated in percents.

**G (Granular)**

Granular products contain active ingredients coated or absorbed onto coarse particles like clay, ground walnut shells or ground corn cobs. The pellets are about the diameter of the lead in a pencil (or larger); during shipment the granules have a tendency to break down and create dust. These are used as purchased. Their concentrations are expressed as percents.

**DF (Dry Flowable),**

**WSG (Water Soluble Granules)**

Also known as water dispersible granules. These are small pellets formulated to reduce the dust problem created with granules. They are like wettable powders except that the active ingredient is formulated on a granule instead of a powder. The product pours easily into spray tanks for mixing with water. Their concentrations are expressed as percents.

**Bait**

Bait products contain active ingredients mixed with food or another attractive substance. Concentrations are expressed in percents.

**Item 4      Liquid or dry form**  
**Column 3**

Ask the respondent if the product was in a liquid or dry state when it was purchased. Record an "L" or a "D" in this column to indicate Liquid or Dry. Be sure the liquid or dry designation listed by the product code selected from the Respondent Booklet agrees with what you record here for the product.

**Item 4      Total amount applied per application**  
**Columns 7 & 8**

Record the total quantity applied per application to all acres of grazed land treated. This figure should be a total quantity for **one application only**.

If the respondent reports an application rate per acre (the amount used in one application to one acre), you need to determine the number of acres treated and multiply these to determine total amount applied. For example, if the respondent reports that Roundup was applied to 20 acres at a rate of 2 pints per acre, multiply 2 times 20 to get 40 pints, the total quantity applied for that application.

In some cases, respondents cannot report either the total amount of the product applied per application or the rate per acre per application of a product. In these cases, there is one additional way you might be able to collect the data we need. If the respondent knows

- 1) the amount of the product mixed with every 100 gallons of water,
- 2) the number of gallons in each tank,
- 3) the number of tanks used to cover the acres,

make a note of these figures. The Survey Statistician will be able to calculate the amount of product used.

Other ways of reporting include parts per million (PPM) and rate per 100 gallons of water. In these cases, try to find out the amount of actual product used (before mixing with water), and **write lots of notes**.

**Do not** record the spray volume applied to the pasture. The purchased (concentrated) product is mixed with water and the diluted spray solution is generally applied at rates of 20 - 60 gallons per acre with ground equipment and 5 - 10 gallons per acre by air.

**Do not** record the inclusion of surfactants in the spray solution. They are added to the spray solution to enhance the ability of the pesticide to stick to the foliage and/or aid in the absorption into the plant system.

**Do not** record liquid fertilizer solutions applied in conjunction with a pesticide in the Pesticide Table.

In Column 8, record the units for the quantity applied. The unit codes are:

Code 1 - POUNDS  
Code 12 - GALLONS  
Code 13 - QUARTS  
Code 14 - PINTS  
Code 15 - OUNCES  
Code 30 - GRAMS

Please write notes if any unit other than the ones listed is reported.

When the reported unit is quite small, you may need to make conversions. Some conversion factors you may need to use are:

LIQUID PRODUCTS  
1 GALLON = 4 QUARTS  
1 QUART = 2 PINTS  
1 PINT = 16 fluid ounces

DRY PRODUCTS  
1 POUND = 16 dry ounces

Be sure to keep the unit code and product formulation consistent. If the operator purchased a LIQUID pesticide product, the unit code must be for ounces, pints, quarts, or gallons. If a DRY pesticide product (granular, wettable powder, or dry flowable) was used the unit code must be for ounces or pounds.

**NOTES**

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## SECTION R - HARVESTED FORAGES AND SUPPLEMENTAL FEED

### What's this Section for? How is this information used?

The purpose of this section is to collect data on the quantities and types of harvested forages and supplemental feed fed to the beef cow-calf herd during the last 12 months. Harvested forages are often needed to sustain cattle over the winter and during drought conditions. The cost of harvested forages accounts for about one-fourth of total variable costs for beef cattle production. Therefore, it is very important to get detailed information on the amounts and types of these feed items used for beef-cow calf production.

Exclude any harvested forages or supplemental feed fed to cattle being finished for slaughter (on feedlots). Exclude any feed provided to cattle placed under contract on other operations.

Include delivery charges if included in the price of the purchased feed.

### Item 1 Harvested forages

Determine if any harvested forages were fed to the beef cattle during the last 12 months. Ask the Respondent to look at the Respondent Booklet and identify the types of harvested forages fed by this operation. If any harvested forages were fed, check YES and complete the Harvested Forages Table. If no harvested forages were fed, check NO and go to Item 2.

### Item 1 Types of harvested forages Column 1

Record all types of harvested forages fed to the beef cattle during the last 12 months. Complete all of Column 1 before completing the rest of the table; that is, list all the types of harvested forages used FIRST. Then, fill out the rest of the row for each type of harvested forage entered in Column 1. The codes for Harvested Forages are:

**Code 1 - ALFALFA AND LEGUME HAY:** Hay is harvested forage plants that are dried and stored for feed. Include hay regardless of type--baled, loose, chopped or shredded. Exclude baled crop residue, such as sorghum or soybean stubble; these should be included in Code 5. Exclude cubes and pellets. This code is for the higher quality alfalfa and legume hay.

**Code 2 - OTHER HAY:** All types of hay other than alfalfa or legume hay.

**Code 3 - HAYLAGE:** Haylage is the result of harvesting and fermenting forage with about 45% moisture in the absence of oxygen.

**Code 4 - SILAGE:** Silage is harvested forage preserved in a moist, succulent condition by partial fermentation.

**Code 5 - HARVESTED CROP RESIDUE:** Crop residue is the portion of plants remaining after harvest, including grain crops such as soybean stubble or corn or sorghum stover. Stover is the stem and leafy parts of a plant. These are most often grazed but may be harvested and stored loose, chopped, shredded, or in bales.

**Code 6 - GREEN CHOP:** Green chop is harvested forage fed to animals while it is fresh and succulent. It is also known as soiling, zero grazing, or green feed.

**Code 7 - STRAW:** Straw is a specific type of harvested crop residue derived from small grain crops, mainly wheat, oats, and barley.

**Code 8 - OTHER HARVESTED FORAGES:** Include cubed or pelleted forage (usually alfalfa) and forages not included in the other categories. Exclude beet pulp, citrus pulp, hominy, cottonseed, etc.

**Item 1            Amount of harvested forages fed**  
**Columns 2 & 3**

In Column 2, record the quantity of harvested forages fed during the last 12 months in either tons, or number of bales or stacks. Bales or stacks should only be used for hay, baled crop residue or straw. In Column 3, enter the unit code associated with the data in Column 2. The unit codes for Harvested Forages are:

Code 3 - TONS  
Code 5 - BALES  
Code 6 - STACKS

**Item 1            Weight of bales or stacks**  
**Column 4**

If bales or stacks are recorded in Column 3 (Code 5 or 6), record the AVERAGE weight in pounds of the bales or stacks fed.

**Item 1      Percent purchased**  
**Column 5**

Record the percentage of each kind of harvested forage that was purchased.

**Item 1      Total cost**  
**Column 6**

If any of the Column 1 harvested forage type was purchased (Column 5 greater than zero), record the total cost of the amount purchased. Enter total dollars paid.

**Item 2      Supplemental feed grains**

Determine if any supplemental feed grains were fed to the beef cattle during the last 12 months. Ask the Respondent to look at the Respondent Booklet and identify the types of supplemental feed grains fed by this operation. If any supplemental feed grains were fed, check YES and complete the Supplemental Feed Table. If none were fed, check NO and go to Item 3.

**Item 2      Types of supplemental feed**  
**Column 1**

In Column 1, record all types of harvested forages fed to the beef cattle during the last 12 months. Complete all of Column 1 before completing the rest of the table; that is, list all the types of supplemental feed grains used FIRST. Then, fill out the rest of the row for each type of supplemental feed grain entered in Column 1. The codes for Supplemental Feed are:

- Code 9 - CORN
- Code 10 - BARLEY
- Code 11 - OATS
- Code 12 - WHEAT
- Code 13 - SORGHUM (MILO)
- Code 14 - OTHER GRAINS

Beef cow-calf operations generally use relatively small amounts of supplemental feed grains and concentrates when compared to finished cattle production. Make sure that feed for finished cattle production is excluded.

**Item 2      Amount of supplemental feed fed**  
**Columns 2 & 3**

In Column 2, record the quantity of supplemental feed fed during the last 12 months. In Column 3, enter the unit code associated with the data in Column 2. The unit codes for supplemental feed fed are:

- Code 1 - POUNDS
- Code 2 - CWT.
- Code 3 - TONS
- Code 4 - BUSHEL

**Item 2      Percent purchased**  
**Column 5**

Record the percentage of each type of supplemental feed that was purchased.

**Item 2      Total cost**  
**Column 6**

If any of the supplemental feed was purchased (Column 5 greater than zero), record the total cost of the amount purchased. Enter total dollars paid.

**Item 3      Concentrates and other feed items**

Determine if any concentrates and other feed items were fed to the beef cattle during the last 12 months. Ask the respondent to look at the Respondent Booklet and identify the types of concentrates and other feed items fed by this operation. If any concentrates and other feed items were fed, check YES and complete the Concentrates and Other Feed Items Table. If none were fed, check NO and go to Section S.

**Item 3      Types of other feed items**  
**Column 1**

In Column 1, record all types of concentrates and other feed items fed to the beef cattle during the last 12 months.

Complete all of Column 1 before completing the rest of the table; that is, list all the types of concentrates and other feed items used FIRST. Then, fill out the rest of the row for each type of concentrate or feed item entered in Column 1.

The codes for Concentrates and Other Feed Items are:

**Code 15 - COMMERCIAL FEED MIX:** include any prepackaged feed mixes produced and marketed by a commercial feed company.

**Code 16 - COMPLETE FEED MIX:** other feed mixes not produced and marketed by a commercial feed company, and may be prepared according to specifications provided by the producer.

**Code 17 - PROTEIN SUPPLEMENT:** include any sources of protein such as soybean meal, cottonseed meal, fish meal or protein blocks.

**Code 18 - SALT and MINERALS:** most often provided in lick blocks.

**Code 19 - MOLASSES**

**Code 20 - UREA**

**Code 21 - POULTRY LITTER**

**Code 22 - PULPS**

**Code 23 - MEDICATED FEED ADDITIVES**

**Code 24 - OTHER (Specify)**

**Item 3            Total cost**  
**Column 6**

Record the total cost of each feed item reported in Column 1. Enter total dollars paid.

**NOTES**

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## SECTION S - FEED STORAGE AND LIVESTOCK HOUSING / HOLDING FACILITIES

### What's this Section for? How is this information used?

The purpose of this section is to collect data on buildings, structures and/or equipment used for feed storage and livestock housing/holding of the beef cow-calf operation during the last 12 months. This information is used to compute capital investment and ownership costs of buildings and equipment. Buildings, structures and/or equipment reported in this section may have been used in other enterprises, but they must have been used at least partially for the cow-calf enterprise during the last 12 months.

#### Item 1      Screener

Record whether any barns or sheds were used for feed storage or beef cattle housing or both during the last 12 months. If none of these structures were used, go to Item 2.

Many operators use the same barns or sheds for more than one purpose. For example, one barn may be used to store hay or other feed in the upper areas or "lofts" of the barn, while cattle and other livestock may have access to shelter in the lower areas. The questions about barns and sheds have been separated from the other facilities because if these types of barns were included in Item 2 (asking about feed storage) and again in Item 3 (asking about livestock holding), then the same barn would be reported in both places. This would result in double counting. Also, it is easier for operators to answer the other questions if the barns and sheds are enumerated first.

#### Item 1a      Barns and sheds

In Item 1a, record the total number of barns and sheds used for beef cow-calf production. Barns may have been used for either feed storage (such as hay storage), cattle housing, or both. Exclude barns used for finished cattle production unless they were also used for the cow-calf enterprise.

#### Item 1b      Total capacity

Record in Item 1b the total capacity of all the barns and sheds reported in Item 1a. Enter the **TOTAL square feet of floor area**. This is equal to the sum of the areas of the individual barns and sheds. The calculation for area is length times width.

For example, if the operator has two barns and one shed which were used for beef cattle production, and the barns were 25 feet wide and 40 feet long and the shed was 20 feet wide and 25 feet long, then the total square feet of floor area is the sum of the areas of the 3 buildings. The two barns have areas equal to 25 ft. X 40 ft. = 1,000 square feet each; the shed has an area equal to 20 ft. X 25 ft. = 500 square feet. Thus the total capacity of the two barns and one shed is 1,000 + 1,000 + 500 = 2,500 square feet.

**Item 1c      Capacity for beef cattle production**

Record in Item 1c the operator's best estimate of the percent of total barn and shed capacity (reported in Item 1b) that was for beef cattle production. This percent should include all uses of barns and sheds for beef cattle production, including feed storage and livestock housing. Exclude any barn or shed use that was for finishing cattle to slaughter.

**Item 2      Feed storage facilities**

Determine if any OTHER feed storage facilities were used for the beef cattle during the last 12 months. Ask the respondent to look at the Respondent Booklet and identify the types of feed storage facilities used by this operation. If any feed storage facilities were used, check YES and complete the Feed Storage Facility Table. If none were used, check NO and go to Item 3.

**Item 2      Type of facility**  
**Column 1**

Record all types of feed storage facilities that were used for the beef cattle during the last 12 months. Complete all of Column 1 before completing the rest of the table; that is, list all the types of feed storage facilities FIRST. Then, fill out the rest of the row for each type of feed storage facility entered in Column 1.

The codes for Feed Storage Facility Types are:

- Code 1 - AIRTIGHT UPRIGHT SILO
- Code 2 - OTHER UPRIGHT SILO
- Code 3 - TRENCH or BUNK SILO
- Code 4 - GRAIN BIN
- Code 5 - METAL FEED TANK
- Code 6 - OTHER BIN TANK
- Code 7 - CORN CRIB
- Code 8 - GRANARY
- Code 9 - CONCRETE SLAB

More than one facility of the same type may be listed on a single line. For example, if an operation has three grain bins, Feed Storage Facility Type Code 4 would be entered in Column 1 only once.

The operation may have more types of facilities used for the beef cattle than those listed. However, information is required only for the types of facilities in the code list.

**Item 2          Number of facilities**  
**Column 2**

Several facilities of the same type may be grouped. In Column 2, record the number of each type of facility entered in Column 1 that were actually used for beef cattle production. In the example above, if only two of the three grain bins were used for beef cattle production, Enter 2 in Column 2.

**Item 2          Total capacity**  
**Column 3 & 4**

In Column 3, record the TOTAL capacity of all the facilities entered in Column 1 that were used for beef cattle production. If more than one facility is reported on a line (that is, the number entered in Column 2 is greater than 1), compute the total combined capacity of all the facilities counted in Column 2. Enter the TOTAL capacity, even if part of the capacity was used for purposes other than beef cattle production.

In Column 4, record the code for the unit in which total capacity was reported in Column 3. The unit codes for capacity units are:

Code 1 - POUNDS  
Code 3 - TONS  
Code 4 - BUSHELS  
Code 12 - GALLONS  
Code 16 - CUBIC FEET  
Code 17 - SQUARE FEET

**Item 2      Percent of total capacity for beef cattle**  
**Column 5**

In Column 5, record the operator's best estimate of the percent of the TOTAL feed storage facility capacity that was for beef cattle production. This percent should include the amount of the storage capacity which held feed for beef cattle production.

For example, if a facility held feed, such as grain, of which 30% was fed to beef cattle for cow-calf production, 50% was sold on the market, and 20% was fed to other livestock, record the 30%, because this reflects the amount fed for beef cow-calf production. In this percent do not include any feed fed to beef cattle being finished for slaughter.

**Item 3      Livestock holding facilities**

Determine if any livestock holding facilities were used for the beef cattle during the last 12 months. Ask the respondent to look at the Respondent Booklet and identify the types of livestock holding facilities used by this operation. If any livestock holding facilities were used, check YES and complete the Livestock Holding Facility Table. If none were used, check NO and go to Item 4.

**Item 3      Type of facility**  
**Column 1**

Record all types of livestock holding facilities that were used for the beef cattle during the last 12 months. Complete all of Column 1 before completing the rest of the table; that is, list all the types of livestock holding facilities FIRST. Then, fill out the rest of the row for each type of livestock holding facility entered in Column 1.

The codes for Livestock Holding Facility Types are:

- Code 10 - FEEDING CORRAL OR LOT
- Code 11 - HOLDING CORRAL OR LOT
- Code 12 - PORTABLE CORRAL
- Code 13 - HOSPITAL CORRAL OR LOT

More than one facility of the same type may be listed on a single line. For example, if an operation has three portable corrals, Livestock Holding Facility Type Code 12 would be entered in Column 1 only once.

Please count each facility only once. Operators may have used a facility for more than one type of activity, such as for both cattle feeding and holding. Count the facility only once under the category for which it was used most often.

The operation may have more types of facilities used for the beef cattle than those listed. However, information is required only for the types of facilities in the code list.

**Item 3      Number of facilities**  
**Column 2**

Several facilities of the same type may be grouped. In Column 2, record the number of each type of facility entered in Column 1 that were actually used for beef cattle production. In the example above, if only two of the three portable corrals were used for beef cattle production, enter 2 in Column 2.

**Item 3      Largest number of head**  
**Column 3**

Record the largest number head of beef cattle that has ever occupied the facility (or facilities) entered in Column 1 and counted in Column 2. Count cow-calf pairs only once. If more than one facility is reported on a line (Column 2 is greater than 1), sum the number of head held by each facility.

**Item 3      Percent of use for beef cattle**  
**Column 5**

In Column 4, record the operator's best estimate of the percent of the livestock holding facility use that was for beef cattle production. This percent should reflect the amount of time the holding facility was used for holding beef cattle relative to other livestock. Also, if the holding facilities were shared with other operations, the percent of use should reflect the amount of total use that was by this operation. In this percent do not include any use for beef cattle being finished for slaughter.

**Item 4      Acres of land used for beef cattle facilities**

Record the total acres of land used for the barns, sheds, feed storage, and livestock holding and handling facilities reported in Items 1, 2 and 3. Exclude land in ranges and pastures reported in Section Q. Exclude land in feedlots and other land associated with finished cattle production.

This may include parts of the farmstead or land occupied by other out-buildings, only if they were used in beef cattle production. Any land reported here must have a facility associated with it that was reported in Items 1, 2 or 3.

Record acres to the nearest TENTH acre (1/10).

## SECTION T - COW-CALF LABOR

### What's this Section for? How is this information used?

The purpose of this section is to collect data on labor use for the beef cow-calf operation during the last 12 months. This information is used to compute costs of paid and unpaid labor used for cattle production.

We collect information on hours worked by unpaid workers, and both hours worked and wage rates for paid workers. Hours worked by unpaid workers are valued according to wage rates that represent what operators and workers could earn in off-farm/ranch activities. This is their opportunity wage rate, or the amount of earnings they are giving up by choosing to be farmers or ranchers. Hours worked by those under 16 years of age are valued at a lower rate because of the fewer off-farm employment opportunities for these workers. Hours worked by paid workers are valued according to the actual wage rates paid.

### Item 1      Labor use

The purpose of this item is to collect data on labor used in the cow-calf operation during the last 12 months.

The procedure used to collect labor hours is to ask the operator to identify and list all the workers that worked on the cow-calf operation during the last 12 months, and then ask how many hours each worker or each group of workers spent doing various activities. This procedure is called a roster. It was developed because, in past surveys, many enumerators tended to use a procedure like this to add up labor hours for various types of workers. We developed the roster for this survey so that all enumerators could take advantage of the same method that already was working well for some enumerators.

We are also asking for hours worked in activities that are specific to beef cow-calf production, rather than during various time periods throughout the year. This should make responding easier for operators because it focuses their attention on the amount of work associated with the specific activities and not to calendar periods.

Complete Item 1 by listing all the workers in Column 1 first, and then completing Columns 2 - 11 for each worker or group of workers reported in Column 1.

**Item 1      Workers**  
**Column 1**

Record all workers, both paid and unpaid, who provided labor for beef cow-calf production on this operation during the last 12 months. Exclude workers who provided labor for finished cattle production only. Exclude any custom or contract labor.

Begin by listing all workers, both paid and unpaid, who provided more than one day of labor for the cow-calf operation during the last 12 months. We cannot account for workers that provided only occasional assistance for jobs such as moving cattle, because we are asking that hours per week be recorded in each column.

If the operator, partners, or the operator's spouse worked on the cow-calf operation, check the check-boxes in Column 1 and continue.

List workers using whatever identifier is comfortable for the respondent. If names are used, record first names only. Workers may be identified by their relation to the operator or by the type of work. For example, the operator may identify a daughter, a grandson, a hired hand and a tractor driver as workers.

If several workers of the same type were used, they may be grouped and listed on a single line. Workers may be grouped in any manner convenient for the respondent. For example, the respondent may group workers by type of work, such as all workers that repaired fences. This will be necessary if you need to record more workers than available lines.

Data recorded in Columns 3, 4, and 10 must be the same for all workers grouped together on one line. For example, a paid part-time worker making \$8.00 per hour should be listed on a separate line from another paid part-time worker making \$6.50 per hour. Also, if the same worker routinely worked both paid and unpaid hours, record this worker on two separate lines.

Be sure to include ALL workers who worked MORE THAN ONE DAY on the cow-calf enterprise during the past 12 months. Exclude contract and custom labor.

After completing the list of all workers in Column 1, proceed to complete Columns 2-11 of the table for each worker or group of workers listed. It is important to identify all workers in Column 1 first before asking additional questions, because the respondent may decide to leave out some workers to avoid the additional questions you'll be asking.

**Item 1      Number of workers**  
**Column 2**

Enter the number of workers in the group listed in Column 1. If an individual worker is recorded in Column 1, enter the number "1." If the PARTNERS box in Column 1 is checked, enter only the number of partners that worked on the beef cow-calf operation, not the total number of partners.

**Item 1      Paid or unpaid worker**  
**Column 3**

Record whether the worker or group of workers listed in Column 1 was:

Code 1 - PAID  
Code 2 - UNPAID

If the box for the operator's SPOUSE is checked in Column 1, determine if he/she is a PAID or UNPAID worker for beef cattle production on the operation.

For PAID workers (code 1), complete Column 4, then continue on to Column 5. For UNPAID workers (code 2), skip to Column 5.

**Item 1      Type of worker**  
**Column 4**

If Column 3 is Code 1(PAID), determine whether each PAID worker or group of PAID workers listed in Column 1 is:

Code 1 - FULL TIME  
Code 2 - PART TIME  
Code 3 - SEASONAL

**Item 1      Hours worked on beef cattle operation**  
**Columns 5, 6, 7, 8 & 9**

For each worker or group of workers listed in Column 1, record the AVERAGE number of hours worked per week on the cow-calf operation during each period.

AVERAGE number of hours worked per week is the TOTAL hours worked divided by the number of weeks in the period.

Include management activities. When asking the hours worked for specific activities, refer to the activities performed **during the last 12 months**. Exclude any hours used for finished cattle production. Exclude hours spent producing hay during the period asked in each column.

In Column 5, record the **AVERAGE** number of hours worked per week by the worker listed in Column 1 during the **CALVING** period. This includes time spent in oversight of cattle during the calving season, actual assistance for calving, and caring for newborn calves. If no defined calving period was used on this operation, ask about hours worked per week when the majority of calves were born.

In Column 6, record the **AVERAGE** number of hours worked per week by the worker listed in Column 1 during the **BREEDING** period. This includes time spent in oversight of cattle during the breeding period, actual assistance for breeding (such as for artificial insemination) and moving bulls and cows on the operation. If no defined breeding period was used on this operation, ask about hours worked per week when the majority of cattle were bred.

In Column 7, record the **AVERAGE** number of hours worked per week by the worker listed in Column 1 during **WEANING** the calves. This includes time spent preparing and separating calves from the cows, and the time required for care of the calves immediately after weaning.

In Column 8, record the **AVERAGE** number of hours worked per week by the worker listed in Column 1 during the **OVER-WINTERING** period. This includes time spent feeding harvested forages and providing cattle shelter during the winter season.

In Column 9, record the **AVERAGE** number of hours worked per week by the worker listed in Column 1 during **ALL OTHER TIMES**. This includes such time as oversight during summer months; building, equipment, fence maintenance and repair, and moving cattle to and from grazing areas.

If respondent can only provide a **TOTAL** number of hours worked during any period, ask them to estimate the number of weeks in that period. Then divide the **TOTAL** hours by the number of weeks to come up with an **AVERAGE**. Be sure to verify this average with the respondent.

If a respondent is unable to provide an estimate for the number of weeks in a period, you may use the following general guidelines for the length of each period:

Column 5 (Calving) -	3 months or 13 weeks
Column 6 (Breeding) -	3 months or 13 weeks
Column 7 (Weaning) -	1 month or 4 weeks

Column 8 (Over-wintering) - 3 months or 13 weeks

Column 9 (All other times) - 2 months or 9 weeks

Length of each period will vary according the specific practices used on the cattle operation and region where the operation is located. These are only approximations. It is preferable to ask the respondent for an estimation of the length of the period.

A column may be zero (dashed) if a worker did no work during one time period or if no work was done by any workers during that period. For example, a column would be blank if no hours were worked during the calving period because all the cattle were out on the range.

When Columns 5-9 have been completed, probe to be sure that all the worker's cow-calf labor during the last 12 months has been counted.

**Item 1          Wage rate for paid workers**  
**Columns 10 & 11**

For PAID workers only (Column 3 is Code 1), record the cash wage rate paid for ALL the work performed by each worker or group of workers listed in Column 1. Enter the wage rate in the unit reported by the respondent:

Code 1 - PER HOUR

Code 2 - PER DAY

Code 3 - PER WEEK

Code 4 - PER MONTH

**Item 2          Percent of unpaid work done by those under 16**

Considering the **total hours worked by unpaid workers on the beef cattle operation** (Column 1 workers with Code 2 (UNPAID) in Column 3 of Item 1), enter the percent of those hours worked by unpaid workers who were under 16 years old.

We will value unpaid labor hours dedicated to the cow-calf operation with an appropriate wage rate to estimate the economic cost of unpaid labor. Since younger workers are often paid less than more experienced workers, we want to separate unpaid labor hours for workers under 16 so we can value them with a different wage rate.

## **SECTION U - HORSES, VEHICLES AND TRACTORS**

### **What's this Section for? How is this information used?**

The purpose of this section is to collect data on horses, vehicles and tractors used for the beef cow-calf operation during the last 12 months. By itemizing the horses, vehicles and tractors, we can estimate the amount of capital invested in these items. These estimates are used in the cost of production budgets in assigning annual costs for "capital replacement" and "other non-land capital." Farmers do not pay this amount each year, but when they purchase machinery, they amortize the cost over the life of the machine. ERS estimates a capital replacement and other non-land capital cost based on the total value of the horses and machinery.

#### **Item 1       Horses and mules**

Determine if any horses or mules were used for the beef cattle operation during the last 12 months. If any horses or mules were used, check YES and continue. If none were used, check NO and go to Item 2.

#### **Item 1a       Number of horses and mules**

Record the number of horses or mules used in beef cow-calf production during the last 12 months. Include only horses or mules used in **working** on the cow-calf operation. Exclude show horses and horses used only for pleasure, rodeo participation or racing.

#### **Item 2       Pickups, cars, sport utility vehicles, ATVs and motorcycles**

Count all of the pick-ups, cars, sport utility vehicles, all-terrain vehicles (ATVs) and motorcycles owned, leased, rented or borrowed, if they were used for beef cattle production during the last 12 months.

Don't count vehicles used by custom operators. Also exclude vehicles owned by the operation but used **ONLY** for custom work, **ONLY** for other commodities or on other operations, or **ONLY** for haying. Count only the vehicles used for beef cow-calf production.

**Item 2      Number of pick-ups, cars, sport utility vehicles, ATVs and motorcycles**  
**Column 2**

In Column 2, enter the total number of each type of vehicle used for beef cow-calf production. Sport utility vehicles are usually four-wheel drive and include such models as Jeeps, Explorers, Broncos, Blazers, etc.

**Item 2      Percent of use for beef cattle production**  
**Column 3**

In Column 3, record the operator's best estimate of the percentage of total farm vehicle use that was for beef cow-calf production. **Exclude from this percentage any vehicle use that was for hay, other harvested forage, grain or production of any feed for beef cattle.**

**Item 3      Trucks**

Include trucks that were owned, rented, leased or borrowed by the operation and used for beef cattle production. Trucks owned in partnership should also be included. Don't count trucks used by custom operators. Also don't count trucks owned by the operation which were ONLY used for custom work, ONLY used for other commodities or ONLY used on other operations. Don't list the same truck on more than one line.

Exclude trucks that were used for finishing cattle unless they were also used for beef cow-calf production. **Exclude trucks that were used for hay, other harvested forage, grain or production of any feed for beef cattle unless they were also used for beef cow-calf production.**

Typical truck use for beef cow-calf production includes, but is not limited to, moving cattle and hauling feed and other inputs.

Exclude pick-ups and sport utility vehicles; they should be included in Item 2.

If more than the available number of lines are needed, use a TRUCKS AND TRACTORS SUPPLEMENT. Copy the identification as it appears on the main questionnaire to the identification box on the supplement. If more lines are needed than are available on one supplement, use another supplement and be sure to make notes for the office.

**Item 3      Make**  
**Column 1**

In Column 1, enter the make of each truck used for beef cow-calf production. It may be easier to start with the smallest truck and go to the largest. Exclude pickups and sport utility vehicles; they should be recorded in Item 2.

**Item 3      Fuel type**  
**Column 2**

In Column 2, enter the code for the type of fuel used:

- Code 1 - DIESEL
- Code 2 - GASOLINE
- Code 3 - LP GAS (liquefied petroleum or propane)
- Code 9 - OTHER

In many states, products sold as gasoline contain ethanol. For the purposes of this survey, if the product is sold as gasoline or gasohol, record it as gasoline (code 2). If the fuel used for the tractor is ethanol or mostly ethanol, use code 9.

**Item 3      Size**  
**Column 3**

In Column 3, enter the size code for each truck:

- Code 1 - SINGLE AXLE
- Code 2 - TANDEM AXLE
- Code 3 - SEMI

**Item 3      Percent of use for beef cattle production**  
**Column 4**

For each truck entered in Column 1, record the operator's best estimate of the percentage of total truck use that was for beef cow-calf production. Typical truck use for beef cow-calf production includes, but is not limited to, moving cattle and hauling feed and other inputs.

**Exclude from this percentage any truck use that was for hay, other harvested forage, grain, or production of any feed for beef cattle.**

**Item 4      Tractors**

Include tractors that were owned, rented, leased or borrowed by the operation and used for beef cow-calf production. Tractors owned in partnership should also be included. Don't count tractors used by custom operators. Also don't count tractors owned by the operation which were ONLY used for custom work, ONLY used for other commodities or ONLY used on other operations. Don't list the same tractor on more than one line.

Exclude tractors that were used for finishing cattle unless they were also used for beef cow-calf production. **Exclude tractors that were used for hay, other harvested forage, grain, or production of any feed for beef cattle unless they were also used for beef cow-calf production.**

Typical tractor use for beef cow-calf production includes, but is not limited to, moving cattle in trailers, processing (grinding and mixing) feed, manure handling and feeding the cattle.

If more than the available number of lines are needed, use a TRUCKS AND TRACTORS SUPPLEMENT. Copy the identification as it appears on the main questionnaire to the identification box on the supplement. If more lines are needed than are available on one supplement, use another supplement and be sure to make notes for the office.

**Item 4      Make and model  
Column 1**

In Column 1, list the make and model for each tractor, such as John Deere 4050. Since PTO horsepower may need to be verified in the office, the make and model are important items.

**Item 4      Drive**  
**Column 2**

In Column 2, enter the code for the type of drive for the tractor listed in column 1:

- Code 2 - 2-WHEEL DRIVE
- Code 3 - 2-WHEEL DRIVE WITH FRONT WHEEL ASSIST
- Code 4 - 4-WHEEL DRIVE
- Code 5 - CRAWLER
- Code 6 - OTHER

**Item 4      PTO HP**  
**Column 3**

In Column 3, record the power take-off (PTO) horsepower rating. If the operator is not sure of the PTO rating, get his/her best estimate and write a note in the margin. Be sure the make and model are correctly listed so the PTO horsepower can be looked up in the State office.

**Item 4      Fuel type**  
**Column 4**

In Column 4, enter the code for the type of fuel the tractor used:

- Code 1 - DIESEL
- Code 2 - GASOLINE
- Code 3 - LP GAS (liquefied petroleum or propane)
- Code 9 - OTHER

In many states, products sold as gasoline contain ethanol. For the purposes of this survey, if the product is sold as gasoline or gasohol, record it as gasoline (code 2). If the fuel used for the tractor is ethanol or mostly ethanol, use code 9.

**Item 4      Percent of use for beef cattle production**  
**Column 5**

For each tractor entered in Column 1, record the operator's best estimate of the percentage of it's use that was for beef cow-calf production.

Typical tractor use for beef cow-calf production includes, but is not limited to, moving cattle in trailers, processing (grinding and mixing) feed, some manure handling, and feeding the cattle. Exclude tractor use associated with finishing cattle. **Exclude from this percentage any tractor use that was for hay, other harvested forage, grain, or production of any feed for beef cattle.**

## **SECTION V - MACHINERY AND EQUIPMENT**

### **What's this Section for? How is this information used?**

This section identifies the specific equipment and machinery used in handling and/or moving feed and manure for the beef cattle operation. From this information, capital investment and associated fixed costs can be calculated. Equipment included in this section may have also been used for other enterprises, such as dairy or hogs, but must have been used at least partially for the cow/calf enterprise during the last 12 months.

The operation may have types of machinery and equipment used for beef cow-calf production other than those listed. However, information is required only for the items in the code lists for this section.

### **Item 1 Machinery and equipment items**

Determine if any machinery and equipment was used for the beef cattle operation during the last 12 months. Ask the Respondent to look at the Respondent Booklet and identify the types of machinery and equipment used by this operation. If any machinery and equipment was used, check YES and complete the Machinery and Equipment Table. If none was used, check NO and go to Conclusion, back page.

Several pieces of identical equipment may be recorded on one line if all of the data for the item are the same.

If more than the available number of lines are needed, use a MACHINERY AND EQUIPMENT SUPPLEMENT. Copy the identification as it appears on the main questionnaire to the identification box on the supplement. If more lines are needed than are available on one supplement, use another supplement and be sure to make notes for the office.

### **Item 1 Type of equipment or machinery Column 1**

In Column 1, record the code for the machinery or equipment item from the Respondent Booklet. If the same piece of equipment was used for more than one purpose, it should be recorded in the Table only once. For example, if the same front end loader was used for both feed handling and manure handling, Code 21 should be recorded in Column 1 only once.

The Feed Machinery and Equipment Codes are:

- Code 1 - PORTABLE GRINDER MIXER
- Code 2 - STATIONARY GRINDER MIXER
- Code 3 - FEED GRINDER
- Code 4 - FEED MIXER
- Code 5 - ROLLER MILL
- Code 6 - HAMMER MILL
- Code 7 - BALE SHREDDER
- Code 8 - TUB GRINDER
- Code 9 - SELF UNLOADING WAGON
- Code 10 - FARM UTILITY WAGON
- Code 11 - FEED TRUCK
- Code 12 - MIXER WAGON
- Code 13 - FEED CONVEYING SYSTEM
- Code 14 - STACK MOVER
- Code 15 - BIG BALE MOVER
- Code 16 - BIG BALE FEEDER
- Code 17 - SILO UNLOADER
- Code 18 - FEED BUNK
- Code 19 - MINERAL FEEDER
- Code 20 - CREEP FEEDER

The Manure Machinery and Equipment Codes are:

- Code 21 - FRONT END LOADER
- Code 22 - SKID or SELF-PROPELLED LOADER
- Code 23 - MANURE SPREADER
- Code 24 - SCRAPER BLADE
- Code 25 - BULLDOZER
- Code 26 - BACKHOE

The Livestock Equipment Codes are:

Code 27 -	ELECTRIC FENCE CHARGER
Code 28 -	LIVESTOCK TRAILER
Code 29 -	HORSE TRAILER
Code 30 -	SQUEEZE CHUTE
Code 31 -	LOADING CHUTE
Code 32 -	BRANDING TABLE
Code 33 -	LIVESTOCK SCALES
Code 34 -	LIVESTOCK SPRAYER
Code 35 -	WATER TANK for HAULING WATER

**Item 1          Number of items**  
**Column 2**

For each machinery or equipment item entered in Column 1, record the number used on this operation during the last 12 months. This must be at least 1 for each entry. More than one piece of equipment of the same type may be accounted for on one line.

**Item 1          Percent of use for beef cattle production**  
**Column 3**

For each machinery or equipment item entered in Column 1, record the operator's best estimate of the percentage of its total farm use that was for beef cow-calf production. **Exclude from this percentage any machinery or equipment use that was for hay, other harvested forage, grain, or production of any feed for beef cattle.** Exclude from this percentage any machinery and equipment use for cattle being finished for slaughter.

**NOTES**

## BACK COVER - CONCLUSION

### Item 1 Location of Selected Field

***V2, V3, V5, V6, V7, V8, V9, & V10***

*Corn, Soybeans, Wheat, Cotton, Potatoes, Flue-Cured Tobacco*

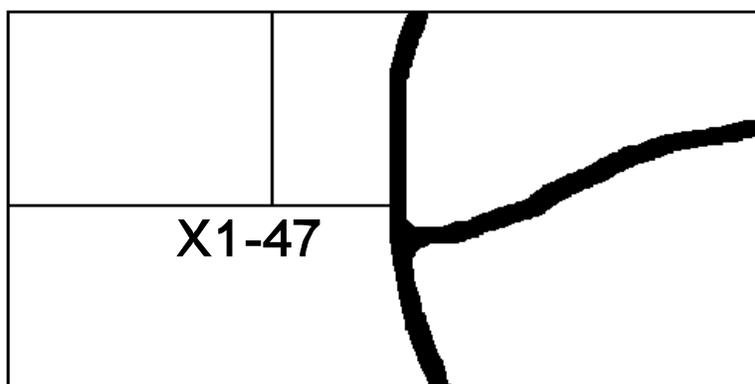
Tell the respondent that you need to mark the location of the selected field of the target commodity on a map. On *Version 10* Multi-Crop, you will locate the selected field of target *commodity 1* only.

Ask the respondent what county the selected field is located in, and record the county name in the space provided.

Mark the location of the selected field of the target commodity with an "X" on the county maps provided by the Office. Verify with the respondent that you have located the field correctly. Be sure that the "X" you mark on the map is in the county named in Item 1.

Next to the "X", record "1-" followed by the sequence (sample) number that appears on the label on the Face Page of the questionnaire. The "1" indicates that this is an ARMS survey sample ("2" designates Vegetable Chemical Use Survey samples in states conducting that survey at the same time as ARMS). This identification code is needed to link the "X" on the map with the data in the completed questionnaire.

An example of plotting the location of the selected field appears below. In this example, X 1-47, the "X" on the map marks the location of the selected target commodity field for Sample Number 47 of the ARMS.



NASS will use this "X" to calculate the longitude and latitude in degrees, minutes and seconds for the selected target commodity field for each sampled operation. ERS will use this information to access the Natural Resources Conservation Service's (NRCS, formerly Soil Conservation Service) Soils V Database. This data base contains soil type, slope, leaching characteristics and other geologic information that is needed for analysis.

## **Item 2 Social Security, Employer ID and State Employer ID**

The operator's Social Security Number (SSN), Federal employer ID number and state (California only - *V4* and *V8*) employer ID number are used to check for duplication within the list frame. If these numbers are printed on the label, just verify them. Don't enter them again if they were correct on the label. Be sure that the Social Security number you record (or verify if we already have it) belongs to the target name and not to someone else associated with the operation. Don't collect the SSN of the person you're interviewing unless this person is the target name.

## **Item 3 Re-contact in the spring 1997**

***V2, V3 & V4 ONLY***

*Corn, Flue-Cured Tobacco, & Cow-Calf Production Practices & Costs*

Inform respondents that they will be re-contacted in February or March of 1997 to collect additional information to complete the profile of their operations for the Agricultural Resource Management Study. Explain that you'll be asking about entire year and year-end information at that time, and it will be easier to collect these figures when their records for 1996 are complete.

It is important that you leave the interview on a good note and that you put the Spring contact in as positive light as possible. After the first of the year, when records are complete and individual receipts and record book line items have been summarized, collecting the information will be easier and take less time. It would be difficult to answer the Spring questions right now, because records are incomplete.

Also, it is important to retain the respondent's cooperation for the Spring interview, because very limited use of the respondent's Production Practices & Costs data can be made if data from the Spring interview is not available. Information would be lost to the ARMS, and this operation would not be represented in the full Agricultural Resource Management **STUDY**.

Emphasize that you will call to make an appointment for a time convenient to the respondent for conducting the Spring interview.

### **Survey Results or Other Agency Publications**

After completing the interview, offer the results of the survey or other Agency or State Office publications to the respondent. A number of publications will result from the ARMS, and they will be published in a variety of sources. Many of these are explained in Chapter 1 of this Manual. In addition, there may be other releases from NASS or your State Office that responding farm operators may be interested in. We would like to serve the respondents better by providing survey results and other information that they will find useful and interesting.

Your Survey Statistician will explain which publications from Headquarters or from your State Office to offer to participants in the ARMS. The Survey Statistician will instruct you how to record requests for information from each respondent, if any Release order forms need to be filled out, or if any additional coding is required on the questionnaire.

### **Respondent Code**

The respondent code is used so we can identify the person who was interviewed. Enter the code identifying the person who provided most of the data. Enter code 1 if the respondent was the operator, manager, or partner. Enter code 2 for the operator's spouse. Enter code 3 if the respondent was an accountant or bookkeeper. Enter code 4 if the respondent was someone other than these people. If the respondent was an accountant, bookkeeper or someone other than the codes listed, record the respondent's name and phone number.

### **Records Use -- Fertilizer and Chemical/Pesticide Data**

**V2, V3, V5, V6, V7, V8, & V9.** If farm records were used for completing the majority of the **fertilizer** data items in the questionnaire, enter code 1=YES in cell 0027.

**V2, V3, V4, V5, V6, V7, V8, & V9.** If farm records were used for completing the majority of the **chemical and pesticide** data items in the questionnaire, enter code 1=YES in cell 0028.

**V10:** Enter the commodity code for target *commodity 1* in cell 0026. Complete cells 0027 and 0028 for the commodity identified in cell 0026. Enter the commodity code for target *commodity 2* in cell 0030. Enter code 1 for YES in cell 0031 if records were used to report

fertilizer data for the commodity identified in cell 0030. Enter code 1 for YES in cell 0032 if records were used to report chemical and pesticide data for the commodity identified in cell 0030.

If you are in a state using *V10* for the NRCS point samples, you will only complete this information for *commodity 1* (if the field where the point is located contains one of the state's target commodities).

On *V10*. MULTI-CROP, the Commodity Codes for the target commodities are:

- Code 1 - CORN
- Code 2 - SOYBEANS
- Code 3 - COTTON
- Code 4 - WINTER WHEAT
- Code 5 - DURUM WHEAT
- Code 6 - (OTHER) SPRING WHEAT
- Code 7 - POTATOES

You can also refer to page 17 of the *V10* questionnaire for a list of these seven codes.

### **Records Use -- Expense Data**

***V2, V3, & V4 ONLY***

*Corn, Flue-Cured Tobacco, & Cow-Calf Production Practices & Costs*

Indicate whether farm/ranch records were used for the completing most of the **expense** items in the questionnaire. In Cell 0029, enter 1 for YES.

### **Supplements Used**

As instructed in earlier sections of this manual, record the total number of each type of supplement used in completing this interview. Be sure all of the supplements are inside the questionnaire before mailing the questionnaire or turning it over to a supervisor.

*Version 2* CORN PRODUCTION PRACTICES & COSTS and *Version 3* FLUE-CURED TOBACCO PRODUCTION PRACTICES & COSTS may have supplements for Fertilizer Applications, Chemical and Pesticide Applications, Field Operations, and/or Trucks and Tractors.

*Version 4: COW-CALF PRODUCTION PRACTICES & COSTS* may have supplements for Chemical and Pesticide Applications, Trucks and Tractors, and/or Machinery and Equipment.

*Versions 5, 6, 7, 8, 9, and 10, the single crop and Multi-Crop PRODUCTION PRACTICES REPORTS,* may have supplements for Fertilizer Applications, Chemical and Pesticide Applications, and/or Field Operations.

### **Ending Time**

Record the ending time of the interview. If more than one person was interviewed or it took more than one appointment to complete the interview, times should reflect the approximate total time for the questionnaire. Exclude the time you spend reviewing the questionnaire or verifying calculations by yourself after you have completed the interview. Be sure the ending time is after the beginning time entered on the face page. Use military time.

### **Date**

Record the date the questionnaire was completed. Enter the date in MM DD YY format on the lines provided in the date cell. For example, if the interview was completed on November 6, 1996, enter 11 06 96 in the date cell.

### **Enumerator Name**

After signing the questionnaire, record your enumerator ID code.



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actual nutrients .....	201, 5052-5054
aeration .....	201
ALS herbicides .....	201
ALS resistance .....	201
animal unit (AU) .....	201
animal unit month (AUM) .....	201
auction pool .....	201
batch .....	201
beneficial insects .....	201
bin .....	201
Bt .....	201
carousel transplanter .....	201
carryover .....	201
cattle on shares .....	201
check-off .....	201
commission charges .....	201
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