



United States
Department
of Agriculture

Statistical
Bulletin
Number
974-2

October
2001



Electronic Report from the Economic Research Service

www.ers.usda.gov

Characteristics and Production Costs of U.S. Cotton Farms

Nora L. Brooks¹

In this report...Producing a pound of cotton cost U.S. farmers 38 cents in operating costs and another 35 cents in overhead costs in 1997, the latest survey year. Individual farm costs ranged from 18 cents to \$1.97 per pound for operating costs and from 28 cents to \$2.96 per pound for total costs. The Prairie Gateway had the largest proportion of cotton farms while the largest cotton farms and the largest share of cotton production were in the Fruitful Rim.

Keywords: Costs of production, operating costs, total costs, low-cost, high-cost, cotton, custom, farm characteristics, enterprise size, Agricultural Resource Management Study.

¹Agricultural Economist, Resource Economics Division, Economic Research Service, USDA

U.S. cotton is a heavily exported commodity, and world economic conditions play a large role in the vitality of this portion of the farm sector. In fact, over the past decade, the United States has accounted for 25 percent of global cotton trade, with 40 percent of U.S. raw cotton being exported. While market variations are largely out of the control of the individual producer, one direct way for the operator to improve prospects is to control production costs. Nearly half the cost of producing cotton is related to seed, fertilizer, chemicals, and custom work.

The cotton version of the 1997 Agricultural Resource Management Study (ARMS) surveyed farmers in 12 States in the Cotton Belt to find out about production practices, characteristics of the farm and operator, and types of strategies they were using to manage their farms. Respondents to the cotton version of the 1997 ARMS represented 28,584 farms producing cotton on

about 13.3 million acres. They represented 91 percent of U.S. cotton farms and 96 percent of planted cotton acres. The data largely reflect conditions facing growers of upland cotton, as only a few growers in the sample reported planting extra long staple or pima cotton.

This report compares selected farm characteristics and production costs among U.S. cotton producers in 1997. Producers are grouped according to total cotton production costs, enterprise size, production region, and the ERS farm typology. This report will use total costs as the basis for cost group analysis to see if there are differences among farms. Total costs represent the level required to reward all the factors of production and keep them in agricultural production over the longer term. For a more complete discussion of how the distribution of farms changes based on the definition of the cost groups, see the [Appendix](#).

Cotton yields and cultural practices distinguished low- and high-cost producers.

Estimated production costs were converted to a per-pound basis and ranked from lowest to highest to form a weighted, cumulative distribution of farms and production. Cotton farms were divided into **three groups**, according to their level of total costs. The low-cost group was the 25 percent of farms with the lowest costs, while the high-cost group was the 25 percent of farms with the highest costs (**fig. 1**). The mid-cost group represented the remaining 50 percent of farms.

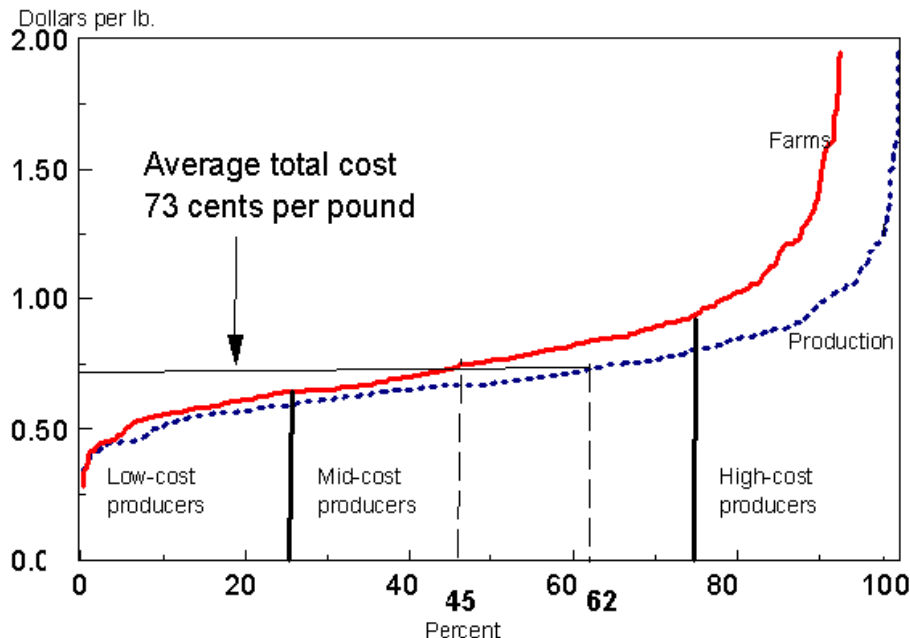
The average total cost of producing cotton in 1997 was \$1.17 per planted acre or 73 cents per pound of lint. Slightly less than half of

ARMS cotton farms had total costs at or below the average cost of 73 cents per pound, which accounted for 62 percent of the 1997 cotton crop (**tables 1 and 2**).

Twenty-five percent of cotton farms surveyed had total costs of 64 cents per pound or less. These low-cost producers accounted for 36 percent of cotton production. The average total cost per pound for this group of farms was 55 cents. High-cost producers with per-pound total costs of 92 cents or more accounted for 12 percent of U.S. cotton production in 1997. The average total cost per pound for this group was \$1.20.

Figure 1
Cumulative distribution of total costs for cotton, 1997

Roughly 45 percent of ARMS cotton farms had total costs at or below the average of 73 cents per pound, accounting for 62 percent of cotton production in 1997.



Source: 1997 Agricultural Resource Management Study, cotton version.

Table 1—Characteristics of cotton farms, by total cost group, 1997

Item	Units	Low-cost	Mid-cost	High-cost	All ARMS farms
Share of ARMS:					
Cotton farms	Percent	25	50	25	100
Cotton production	Percent	36	52	12	100
Lint yield – actual	Pounds	892	725	421	711
Lint yield – expected	Pounds	863	764	563	751
Total acreage operated	Acres	1,477	1,118	1,173	1,222
Planted cotton acreage	Acres	541	474	385	469
Farm value of production	Dollars per farm	606,587	488,710	318,525	475,540
Cotton value of production	Dollars per farm	288,937	211,160	135,452	211,622
Cotton under contract	Percent of value	15	14	10	13
Expected price at planting	Dollars per pound	.716	.677	.694	.691
Harvest month price	Dollars per pound	.695	.687	.679	.689

Table 2—Historical cotton production costs and returns per planted acre, by total cost group, 1997

	Low-cost	Mid-cost	High-cost	All ARMS farms
Dollars				
Costs per pound of lint:				
Operating costs, actual yield	.31	.38	.57	.38
Total costs, actual yield	.55	.74	1.20	.73
Costs and returns per acre:				
Gross value of production	709.06	569.72	328.54	560.18
Total operating costs:	276.05	278.86	240.58	270.17
Seed	16.40	17.56	18.49	17.42
Fertilizer	36.13	37.32	27.97	35.05
Chemicals	62.29	66.05	49.89	61.64
Custom operations	21.99	19.48	15.67	19.42
Fuel, lube, electricity	25.33	26.69	47.92	30.67
Repairs	23.66	27.10	25.18	25.71
Purchased irrigation water	5.36	11.78	9.38	9.44
Interest on operating inputs	6.69	6.80	5.81	6.56
Ginning	78.21	66.08	40.25	64.26
Total allocated overhead:	211.87	260.73	266.35	247.82
Hired labor	35.66	41.96	47.15	41.21
Opportunity cost of unpaid labor	22.98	32.51	39.76	31.26
Capital recovery of machinery & equipment	88.08	100.31	94.72	95.64
Opportunity cost of land	42.17	57.51	47.16	50.96
Taxes and insurance	12.02	14.58	16.95	14.33
General farm overhead	10.96	13.87	20.61	14.42
Total costs	487.91	539.58	506.93	517.99
Returns above operating costs	433.01	290.86	87.96	290.01
Returns above total costs	221.14	30.14	-178.39	42.19

Low-cost producers reported yields of 892 pounds of lint per acre and average total costs of 55 cents per pound. In contrast, high-cost producers reported yields of 421 pounds of lint per acre and total costs of \$1.20 per pound. Actual yields on low-cost farms were 29 pounds per acre higher than the producer expected at planting. High-cost farms, in contrast, had yields 142 pounds below expectations. Similarly, mid-cost farms had lower yields than were expected at planting time. Harvest month prices were lower than both low- and high-cost growers expected, but higher than mid-cost growers expected.

On a per-acre basis, total costs for high-cost producers were \$507 versus \$488 for low-cost producers. Operating costs were \$36 per acre lower for high-cost producers than for low-cost producers. Allocated overhead costs were \$54 higher for high-cost producers. Allocated overhead costs accounted for 53 percent of total costs for high-cost producers compared with only 43 percent for low-cost producers.

Cotton production is highly mechanized today. However, it is still quite labor intensive, and labor costs, both hired and unpaid, are much higher for high-cost than low-cost producers. Hired labor was a larger component than unpaid labor, but the difference in hired labor costs was not statistically significant.

High-cost growers had lower operating costs largely attributable to lower fertilizer, chemical, and custom costs. High-cost growers put \$27 per acre less into these inputs, but used \$23 more fuel per acre. Ginning costs were almost double for low-cost growers because their yields were more than double those realized by high-cost growers.

High-cost growers planted fewer acres of cotton (fig. 2), and abandoned 26 of their 385 planted acres while low-cost growers harvested all their cotton acres. The low-cost growers reported more trips across the field with all chemicals.

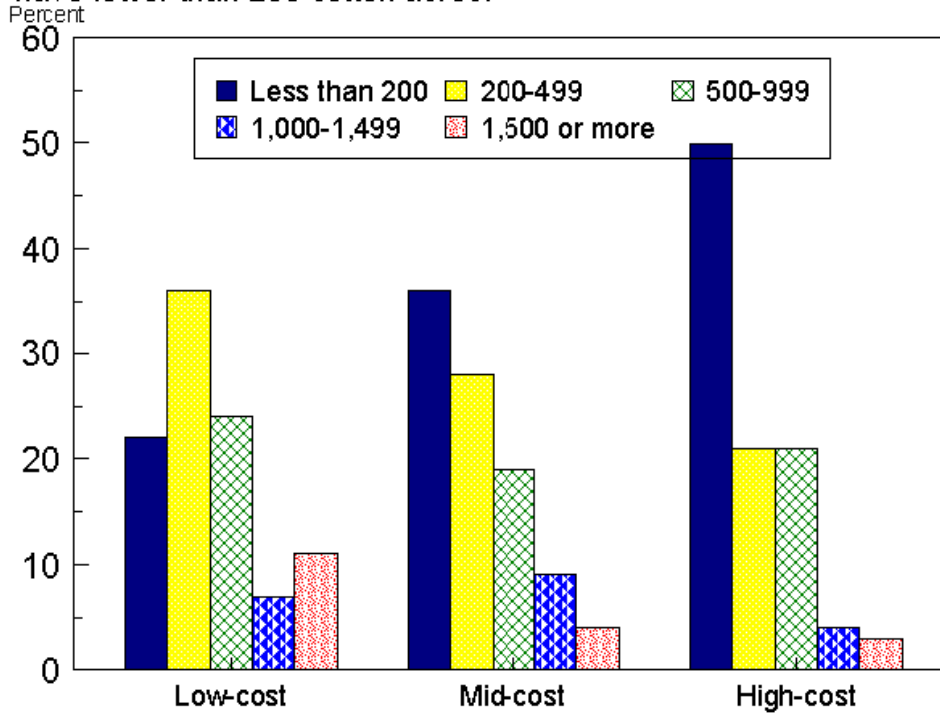
Most growers applied herbicides as routine practice whether they were pre-emergent or post-emergent applications. The highest proportions of low-cost growers applied insecticides based on scouting data while the highest proportion of high-cost growers used their own determination of infestation levels as the basis for their decision to apply insecticides. In addition, low-cost farms were more likely than high-cost farms to use soil, plant tissue, and nitrogen tests. Test results were used in deciding nitrogen applications, with 95 percent of low-cost farms applying either the recommended or a lesser amount of nitrogen per acre.

Cultural practices also vary between low- and high-cost growers. The majority of both groups planted in May—a larger percentage of high-cost growers planted in June. While most cotton is planted in solid rows, high-cost growers were more likely than low-cost growers to plant skip-row cotton. The most common skip pattern was to plant two rows and skip one. The majority of low-cost growers harvested their cotton in October, while 36 percent of high-cost growers harvested in October and 39 percent in November. High-cost farms were much more likely to use cotton strippers to harvest, while low-cost farms were more likely to use pickers to harvest. High-cost farms were also more likely to use module builders. Module builders are used in many picker-type operations as cost savers to facilitate storage in the field without wagons or trailers.

The only significant difference in enterprise size was in the largest size category. Roughly 8 percent of low-cost farms had 1,500 cotton acres or more, while only 3 percent of high-cost producers had 1,500 or more cotton acres. A significantly higher percentage of low-cost operators were in the very large family typology category—27 percent compared with only 12 percent for high-cost producers.

Figure 2 Enterprise size varies across cost groups

The largest percentage of low-cost farms have 500 cotton acres or more while 40 percent of mid- and high-cost farms have fewer than 200 cotton acres.



Source: 1997 Agricultural Resource Management Study, cotton version

High-cost producers were twice as likely as low-cost producers to plant cotton on land they share-rented. Some 54 percent of high-cost growers reported planting cotton on land they share-rented, while 45 percent of low-cost growers

reported planting cotton on land they owned. While the largest proportion of cotton farms was in the Prairie Gateway, 29 percent of low-cost growers were in the Southern Seaboard compared with 18 percent of high-cost growers.

Farms with larger cotton enterprises receive more of their sales from cotton and have lower costs per pound than do farms with smaller cotton enterprises.

Cotton growers reported planting 469 acres of cotton in 1997 on average (table 3). Roughly one-third of U.S. cotton farms planted 500 or more acres of cotton. This third of growers produced three-fourths of all U.S. cotton in 1997.

Per acre yields were lower than expected across all size classes—those with 1,000-1,499 acres came the closest to realizing the yields they expected.

As farm size increased, so did the size of the cotton enterprise. On the smallest farms, the cotton enterprise accounted for 17 percent of all acres operated compared with 62 percent on the largest farms. Both cotton value of production and total farm value of production rose as the size of the cotton enterprise increased. On the smallest farms, cotton accounted for 26 percent of the farm value of production, while cotton contributed 69 percent of the total value of production on the largest farms. Contracting was much more common on the largest farms as well—22 percent versus 7 percent on the smallest farms.

Per pound production costs also declined as enterprise size increased (table 4). Operating costs fell from 41 cents per pound of actual lint yield on the smallest farms to 36 cents per pound on the largest farms. Total costs also declined as size increased—from 78 cents per pound of lint on the smallest farms to 68 cents per pound on the largest farms. While the largest proportions of farms are in the mid-cost group by definition, farms with fewer than 200 cotton acres planted had higher proportions of high-cost farms than low-cost farms. Farms with 500 or more cotton acres had higher proportions of low-cost than high-cost. Of the farms with fewer than 1,000 cotton acres, 25-27 percent were high-cost while only 13-17 percent of farms with 1,000 or more acres were high-cost.

Differences in seed costs were not statistically

significant among the size classes, but seeding rates and the source of the seed did have some significant differences. Growers who planted 1,000-1,499 acres of cotton had the lowest seeding rate while growers with more than 1,500 acres had the highest seeding rates. The majority of all growers used purchased seed, with the smallest farms having the largest proportion of purchased seed. This proportion declined as the enterprise size rose. While the largest farms had the most homegrown seed, the differences were significant only between the three smallest classes and those with 1,000-1,499 cotton acres. Differences in the use of transgenic seed were not statistically significant.

Taken together, costs for fertilizer, chemicals, custom operations, and fuel, lube, and electricity accounted for 58 percent of operating costs on the smallest farms and 53 percent on the largest farms. While the differences in ginning costs appear quite large, they were not statistically significant.

There were substantial differences among farmers in their reasons for applying herbicides and insecticides and in conducting soil tests among sizes of farms. For herbicide applications, farmers of all size operations reported routine practice or treatment as the most common reason for either pre- or post-emergent herbicide application. Smaller operations tended to obtain recommendations most often from dealers, while larger operations used crop consultants more often. For insecticide applications, smaller operations most often reported either operator's determination or standard practice, followed by scouting data or preventive schedule, as the reason for insecticide application. For larger operations scouting was, by far, the most common reason reported for insecticide use followed by operator's determination and preventive schedule. Farms with 1,000-1,499 acres also most frequently reported use of soil and other tests.

Table 3—Characteristics of cotton farms, by enterprise size, 1997

Item	Units	Less than 200	200- 499	500- 999	1,000- 1,499	1,500 or more	All ARMS farms
Share of ARMS:							
Cotton farms	Percent	38	28	21	7	5	100
Cotton production	Percent	6	18	29	18	29	100
Lint yield – actual	Pounds	669	652	681	714	799	711
Lint yield – expected	Pounds	712	698	739	737	824	751
Total acreage operated	Acres	493	1,098	1,654	2,518	3,501	1,221
Planted cotton acreage	Acres	83	326	667	1,167	2,183	469
Farm value of production	Dollars per farm	150,425	433,236	671,807	1,061,268	1,405,587	475,540
Cotton value of production	Dollars per farm	38,509	147,939	304,951	512,741	976,803	211,622
Cotton under contract	Percent of value	7	10	15	12	22	13
Expected price at planting	Dollars per pound	.669	.703	.709	.707	.690	.691
Harvest month price	Dollars per pound	.685	.685	.688	.689	.693	.689

Table 4—Historical cotton production costs and returns per planted acre, by enterprise size, 1997

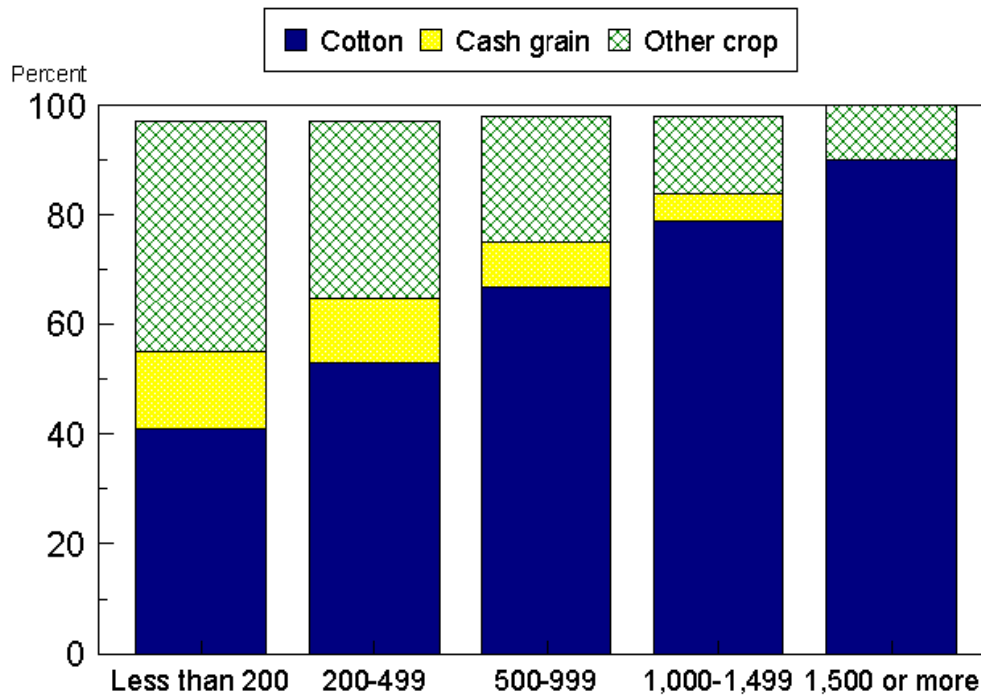
	Less than 200	200- 499	500- 999	1,000- 1,499	1,500 or more	All ARMS farms
Dollars						
Costs per pound of lint:						
Operating costs, actual yield	.41	.39	.39	.37	.36	.38
Total costs, actual yield	.78	.78	.75	.71	.68	.73
Costs and returns per acre:						
Gross value of production	522.40	509.54	534.63	563.13	636.99	560.18
Total operating costs:	277.29	251.63	265.25	268.06	289.88	270.17
Seed	17.86	17.26	16.52	18.27	17.89	17.42
Fertilizer	39.91	35.87	36.95	35.49	30.61	35.05
Chemicals	54.74	52.28	59.65	60.62	73.72	61.64
Custom operations	40.05	19.07	17.60	20.95	15.35	19.42
Fuel, lube, and electricity	27.38	31.54	31.23	26.19	33.38	30.67
Repairs	24.75	24.67	25.43	25.81	27.03	25.71
Purchased irrigation water	4.83	5.19	9.86	9.58	13.31	9.44
Interest on operating inputs	6.78	6.10	6.42	6.50	7.08	6.56
Ginning	61.00	59.64	61.58	64.65	71.52	64.26
Total allocated overhead:	246.22	258.09	242.66	242.10	250.46	247.82
Hired labor	31.18	41.37	43.26	45.47	38.29	41.21
Opportunity cost of unpaid labor	54.19	46.50	30.66	21.84	20.92	31.26
Capital recovery of machinery & equipment	88.21	88.02	96.99	98.25	100.02	95.64
Opportunity cost of land	37.60	44.76	42.01	53.15	68.19	50.96
Taxes and insurance	18.34	20.51	14.01	12.62	10.10	14.33
General farm overhead	16.70	16.92	15.73	10.77	12.94	14.42
Total costs	523.51	509.71	507.90	510.16	540.35	517.99
Returns above operating costs	245.1	257.91	269.38	295.07	347.11	290.01
Returns above total costs	-1.11	-0.17	26.72	52.97	96.64	42.19

Custom operations costs were significantly higher for the smallest enterprises than for all other sizes. The smallest farms used more custom services than any other size class, particularly custom cultivation and harvesting. They did, however, use significantly less custom scouting than the larger farms. Growers with 1,000-1,499 cotton acres reported the use of custom scouting most often. Scouting recommendations were also reported most often by the two largest groups of farms as the basis of the decision to apply insecticides.

Growers with the smallest cotton enterprises were more likely to be sole proprietorships and to own their own land. When they did rent land, they chose cash rent more often than share rent. Some 41 percent of growers with less than 200 cotton acres specialized in cotton production while 42 percent specialized in crops other than cotton or cash grains, mostly vegetables or soybeans (fig. 3). Roughly one-fourth of farms with less than 500 cotton acres were considered high-cost producers. Half of growers with less than 200 cotton acres listed a nonfarm occupation, and almost three-fourths were in a favorable financial condition.

Figure 3 Specialization of cotton farms

Ninety percent of farms with 1,500 or more cotton acres specialized in cotton, while roughly 40 percent of farms with less than 200 cotton acres specialized in either cotton or other crops.



Source: 1997 Agricultural Resource Management Study, cotton version

Characteristics of Cotton Producers by Region

Both costs and returns vary regionally due to differences in yields and use of irrigation.

A third of all ARMS cotton farms were in the Prairie Gateway while the Southern Seaboard and the Mississippi Portal regions each had 24 percent of cotton farms (see [fig. 4](#) for regions). Together these three regions accounted for 69 percent of 1997 cotton production ([table 5](#)). The Fruitful Rim had the highest share of production of any one region (26 percent). Lint yields were lower than growers expected in all regions except the Fruitful Rim—this region reported the highest yields of any region and almost double the U.S. average.

In aggregate, growers in the Fruitful Rim had larger farms and more cotton acres than growers in the other regions. Proportionally, however, cotton accounted for 36 percent of acres and 40 percent of total farm sales in the Fruitful Rim compared with 44 percent of total acres operated and 49 percent of total farm sales in the Heartland. Farms in the Mississippi Portal

region derived 58 percent of their total value of production from cotton sales on 39 percent of acres operated. Although farms in the Prairie Gateway had the lowest average values for both cotton sales and total sales, they had the highest proportion of sales (61 percent) from cotton and the lowest proportion of value under contract. Growers in the Prairie Gateway were more likely to specialize in cotton production (67 percent), while 51 percent of growers in the Southern Seaboard reported another crop as their specialty.

Operating costs per pound of lint were highest in the Fruitful Rim, while total costs per pound were highest in the Prairie Gateway ([table 6](#)). Operating costs were lowest in the Heartland. The lowest total costs per pound were in the Heartland and Mississippi Portal regions. On a per-acre basis, both operating and total costs were lowest in the Prairie Gateway and highest in the Fruitful Rim.

Figure 4 U.S. farm resource regions

In 1997, the highest proportion of cotton farms was in the Prairie Gateway. Growers in the Fruitful Rim had the highest yields.

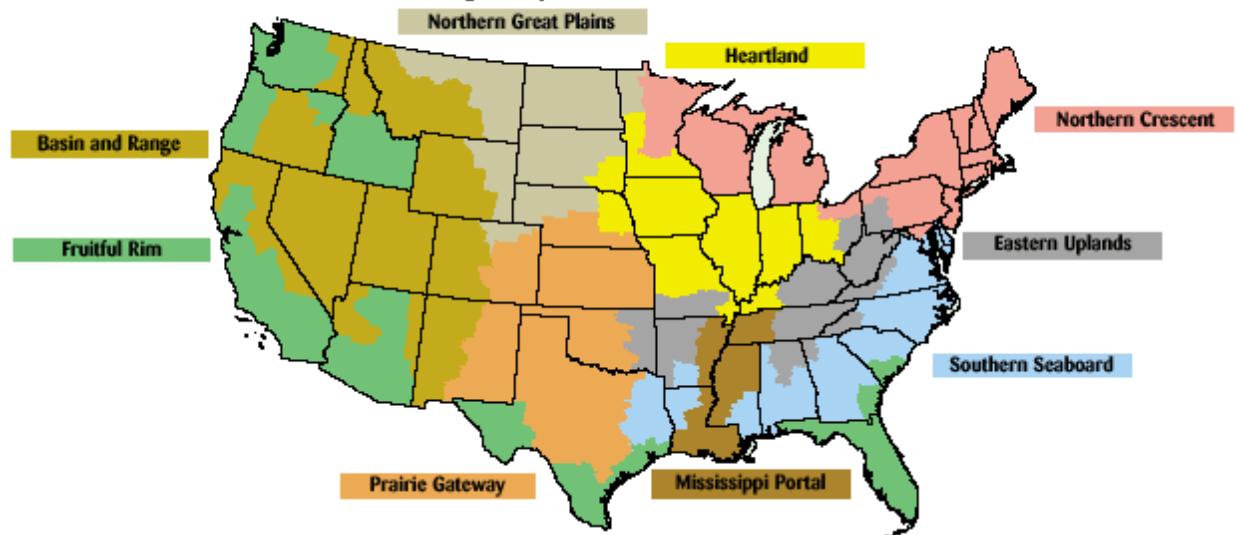


Table 5—Characteristics of cotton farms, by region, 1997

Item	Units	Heartland	Prairie Gateway	Southern Seaboard	Fruitful Rim	Mississippi Portal	All ARMS farms
Share of ARMS:							
Cotton farms	Percent	4	33	24	14	24	100
Cotton production	Percent	4	24	20	26	25	100
Lint yield – actual	Pounds	726	466	714	1,131	807	711
Lint yield – expected	Pounds	751	498	805	1,155	821	750
Total acreage operated	Acres	1,080	1,336	1,049	1,510	1,086	1,221
Planted cotton acreage	Acres	475	515	398	543	427	469
Farm value of production	Dollars per farm	363,140	235,239	595,156	1,041,206	385,762	475,540
Cotton value of production	Dollars per farm	176,973	142,718	183,556	413,348	223,271	211,622
Cotton under contract	Percent of value	21	8	11	16	17	13
Expected price at planting	Dollars per pound	.719	.653	.727	.738	.675	.691
Harvest month price	Dollars per pound	.696	.643	.702	.739	.670	.689

Table 6—Historical cotton production costs and returns per planted acre, by region, 1997

Item	Heartland	Prairie Gateway	Southern Seaboard	Fruitful Rim	Mississippi Portal	All ARMS farms
Dollars						
Costs per pound of lint:						
Operating costs, actual yield	.33	.37	.38	.41	.36	.38
Total costs, actual yield	.67	.83	.68	.74	.67	.73
Costs and returns per acre:						
Gross value of production	570.33	342.50	564.53	979.41	610.97	560.18
Total operating costs:	243.27	172.35	272.22	468.84	291.06	270.17
Seed	9.44	14.20	18.36	22.32	19.24	17.42
Fertilizer	35.80	18.04	50.75	45.39	40.69	35.05
Chemicals	74.42	25.49	68.89	93.07	90.69	61.64
Custom operations	7.20	9.35	15.96	53.95	16.33	19.42
Fuel, lube, and electricity	19.39	29.50	24.21	55.04	22.96	30.67
Repairs	30.05	23.20	21.84	30.08	29.80	25.71
Purchased irrigation water	0	0	0	57.53	0	9.44
Interest on operating inputs	5.97	4.15	6.56	11.45	7.13	6.56
Ginning	61.01	48.41	65.64	100.00	64.22	64.26
Total allocated costs:	246.44	214.61	212.99	367.85	247.42	247.82
Hired labor	17.29	24.33	30.01	100.36	38.88	41.21
Opportunity cost of unpaid labor	21.67	35.22	35.64	28.42	24.30	31.26
Capital recovery of mach. & equip.	110.31	83.14	83.50	117.63	110.01	95.64
Opportunity cost of land	85.24	48.09	35.45	77.13	45.30	50.96
Taxes and insurance	6.27	14.20	16.82	14.85	13.39	14.33
General farm overhead	5.64	9.63	11.57	29.46	15.55	14.42
Total costs	489.71	386.96	485.22	836.69	538.49	517.99
Returns above operating costs	327.06	170.15	292.30	510.57	319.91	290.01
Returns above total costs	80.62	-44.46	79.31	142.72	72.49	42.19

Seed costs were significantly lower in the Heartland than the other regions and significantly higher in the Fruitful Rim. Seeding rates varied from 9 pounds per acre in the Southern Seaboard to 17 pounds per acre in the Prairie Gateway. Most growers used purchased seed, ranging from 61 percent of seed in the Prairie Gateway to 100 percent in the Southern Seaboard. Use of transgenic seed was significantly higher in the Southern Seaboard and Fruitful Rim than in the Prairie Gateway.

Most growers in the Fruitful Rim planted in April, whereas most growers in the other regions planted in May. A third of growers in the Prairie Gateway used skip-row production (mostly plant two rows, skip one) as did 2 percent in the Mississippi Portal. Growers in the other regions planted solid rows only. Most growers in the Heartland, Fruitful Rim, and Mississippi Portal harvested in October while most growers in the Prairie Gateway and Southern Seaboard harvested in November. More than 80 percent of growers in the Prairie Gateway used stripper harvesters and 60 percent used module builders—considerably more than in any other region. Module builders are generally used to store cotton in the field and are therefore used more often in drier climates.

Taken together, costs for fertilizer, chemicals, custom operations, and fuel, lube, and electricity accounted for a low of 48 percent of operating costs in the Prairie Gateway to a high of 59 percent in the Southern Seaboard and Mississippi Portal. Ginning costs were lowest in the Prairie Gateway and highest in the Fruitful Rim due to yields. Heavy use of irrigation in the Fruitful Rim explains the higher costs for fuel there.

Fertilizer and chemical costs were significantly lower in the Prairie Gateway than in all other regions. Less than two-thirds of these growers used insecticides compared with 84-92 percent in the other regions. Only 57 percent of growers in the Prairie Gateway reported using nematicides compared with all growers in the Heartland. Growers in the Heartland made the fewest trips

over the fields with insecticides during a season, but the most trips with herbicides. In contrast, growers in the Fruitful Rim made the fewest trips with herbicides and the most trips with insecticides. Applications of both pre- and post-emergent herbicides were generally made as a routine practice, although the highest proportion of growers in the Prairie Gateway used weed type and density as their primary decision factor.

Custom operations were also significantly higher in the Fruitful Rim than in other regions. These growers reported using custom applications for chemicals (55 percent), fertilizers (46 percent), harvesting (44 percent), and scouting (40 percent). Sixty percent of growers in the Mississippi Portal and 59 percent of growers in the Southern Seaboard reported scouting. Growers in the Heartland applied insecticides most often based on a preventive schedule and history of past pest problems. Growers in the Prairie Gateway used their own determination of infestation levels as the primary determinant. Growers in the Southern Seaboard, Fruitful Rim, and Mississippi Portal used scouting data followed by their own determinations as the basis of their decisions to apply insecticides.

More than a third of farms in the Prairie Gateway and the Fruitful Rim were high-cost producers compared with 11 percent in the Mississippi Portal (fig. 5). Per-pound total costs were highest in the Prairie Gateway and Fruitful Rim. Yields in the Fruitful Rim far surpassed those of the other regions. Irrigation in this region evens out the effects of adverse weather conditions but raises production costs considerably. Ginning costs were higher here, as they are based on yields. Yet, farmers in the Fruitful Rim had the highest returns above costs, on average, of any region. Higher yield compensates for higher production costs, and both the expected and harvest month prices were higher in the Fruitful Rim than in the other regions.

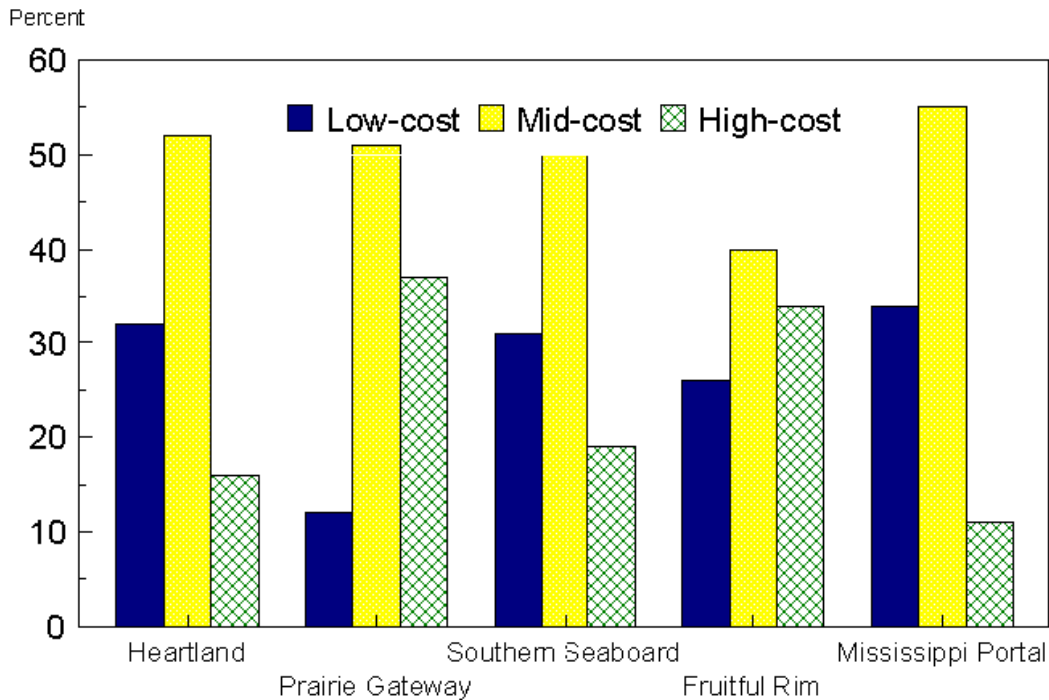
Sixty-five percent of growers in the Fruitful Rim were in the three large-farm categories based on the typology, compared with only 28 percent in

the Prairie Gateway. Most cotton farms were sole proprietorships. In the Fruitful Rim, 57 percent of farms were organized as sole proprietorships, while 22 percent were

corporations. Of all regions, the Southern Seaboard had the lowest proportion of farms in a favorable financial condition.

Figure 5 Distribution of cost groups varies regionally

More than a third of the farms producing cotton in the Prairie Gateway and Fruitful Rim in 1997 were high-cost producers, while just under a third of farms in the other regions were low-cost producers.



Source: 1997 Agricultural Resource Management Study, cotton version

Smaller farms are more likely to specialize in cotton and have proportionally higher cotton receipts than larger farms.

The ERS farm typology stratifies farms according to gross value of farm product sales and occupation of the operator (see Hoppe and others, 1999). The cotton version of the 1997 ARMS did not have adequate sample size to use all the classes in the typology. As a result, the three smallest classes of farms (limited-resource, retirement, and residential/lifestyle) have been combined for this report and will be called “other small farms.”

Cotton farms were fairly evenly distributed, with 15-20 percent in each of the typology groups except nonfamily, which only had 6 percent of farms. As with the national distribution of farms, the share of cotton production rises with farm size. In fact, the 39 percent of farms in the large family and very large family categories accounted for 60 percent of cotton production in 1997 (table 7).

The size of the cotton enterprise rose along with farm size. All farms in the other small farm group had fewer than 500 cotton acres while 27 percent of very large family and 37 percent of nonfamily farms had 1,000 or more cotton acres (fig. 6). The cotton enterprise accounted for 45 percent of total operated acreage on high-sales farms—the highest percentage of the typology groups. Low-sales farms had the next highest proportion of land devoted to cotton at 42 percent. Other small farms had the lowest proportion.

As discussed in the section on enterprise size, the value of production for both the farm and the cotton enterprise rose with size. But unlike the acreage concentrations, the largest farms did not have the highest concentration of sales from cotton. Low-sales family farms had the highest proportion of sales coming from cotton (73 percent) followed by high-sales (62 percent) and other small family farms (61 percent). Very large family and nonfamily farms had the lowest proportions, 36

and 42 percent, respectively. Very large family farms had the lowest proportion of farms specializing in cotton production across the typology, and the largest proportion of farms specializing in livestock (see app. table 4). Large family farms received 53 percent of total value of production from cotton.

Production costs varied among the typology groups, but the most significant differences were between small and large farms (table 8). The only groups for which the difference in operating costs per pound of lint were statistically significant were low-sales and large family farms. For total costs, significant differences were found between very large family farms and low-sales, high-sales, and large family farms as well as between high-sales and nonfamily farms. On a per-acre basis, the large, very large, and nonfamily farms had higher operating costs. These groups also had significantly higher per acre total costs, although the difference between other small farms and large family farms was not statistically significant. Returns above operating costs for nonfamily farms were significantly higher than for all other typology groups.

While yields were lower than growers expected across the typology, other small farms and large family farms had the largest yield shortfalls. Low-sales farms nearly realized their expected yields, yet this group had the lowest expected yields. Although their harvest month price exceeded their expectations, this was the lowest price across the typology. The three large farm groups expected higher prices at planting than did the smaller groups. While harvest month prices were lower than growers expected at the time the cotton was planted, the harvest month price was still higher than that received by the farm occupation groups. They used significantly more herbicide-resistant seed; there were no statistically significant differences in Bt seed use.

Table 7—Characteristics of cotton farms, by farm typology, 1997

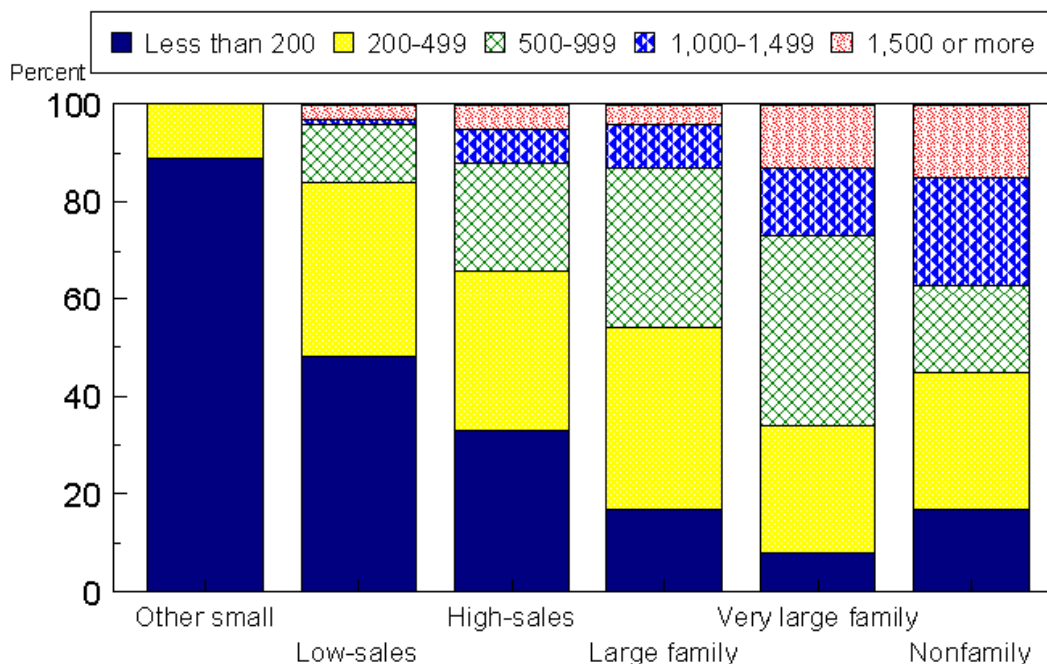
Item	Units	Other small farm	Farm occupation		Large family	Very large family	Non- family	All ARMS
			Low-sales	High-sales				
Share of ARMS:								
Cotton farms	Percent	20	15	20	20	19	6	100
Cotton production	Percent	3	7	14	21	39	16	100
Lint yield – actual	Pounds	547	486	522	626	842	1,113	711
Lint yield – expected	Pounds	630	492	562	708	859	1,146	751
Total acreage operated	Acres	418	743	1,037	1,400	2,092	2,387	1,221
Planted cotton acreage	Acres	84	309	466	548	801	852	469
Farm value of production	Dollars per farm	48,250	114,811	231,152	408,341	1,255,869	1,384,834	475,540
Cotton value of production	Dollars per farm	29,469	84,174	143,479	214,590	458,898	580,750	211,622
Cotton under contract	Percent of value	15	12	11	13	14	13	13
Expected price at planting	Dollars per pound	.677	.653	.678	.703	.722	.743	.691
Harvest month price	Dollars per pound	.671	.660	.668	.671	.693	.736	.689

Table 8—Historical cotton production costs and returns per planted acre, by typology, 1997

Item	Other small farm	Farm occupation		Large family	Very large family	Non- family	All ARMS farms
		Low-sales	High-sales				
Dollars							
Costs per pound of lint:							
Operating costs, actual yield	.40	.35	.38	.39	.37	.40	.38
Total costs, actual yield	.71	.79	.80	.77	.69	.68	.73
Costs and returns per acre:							
Gross value of production	418.73	364.85	397.19	476.70	665.24	957.22	560.18
Total operating costs:	217.78	168.69	200.53	242.72	311.87	445.29	270.17
Seed	14.83	17.28	13.37	17.40	19.20	20.50	17.42
Fertilizer	27.76	21.50	27.17	34.26	41.57	46.43	35.05
Chemicals	42.45	29.66	37.13	56.69	78.66	102.05	61.64
Custom operations	35.93	8.62	11.90	15.34	18.72	49.26	19.42
Fuel, lube, and electricity	18.26	21.35	31.95	28.01	35.41	32.55	30.67
Repairs	19.37	19.81	23.49	26.70	28.17	27.68	25.71
Purchased irrigation water	3.11	0.00	1.02	0.45	8.41	59.73	9.44
Interest on operating inputs	5.36	4.05	4.83	5.88	7.60	10.87	6.56
Ginning	50.71	46.42	49.69	57.98	74.13	96.22	64.26
Total allocated overhead:	173.58	218.09	217.65	236.94	271.77	307.52	247.82
Hired labor	14.30	24.22	25.04	33.20	54.48	73.34	41.21
Opportunity cost of unpaid labor	44.53	45.69	38.68	30.01	27.08	15.17	31.26
Capital recovery of mach. & equip.	65.42	72.17	82.15	99.57	107.22	108.23	95.64
Opportunity cost of land	29.30	48.52	47.54	44.27	53.63	73.96	50.96
Taxes and insurance	12.96	16.53	13.89	15.76	14.12	10.98	14.33
General farm overhead	7.07	10.96	10.35	14.14	15.24	25.84	14.42
Total costs	391.36	386.78	418.18	479.66	583.65	752.81	517.99
Returns above operating costs	200.94	196.16	196.66	233.98	353.37	511.94	290.01
Returns above total costs	27.37	-21.93	-20.99	-2.96	81.60	204.41	42.19

Figure 6 Enterprise size varies across the typology

89 percent of the smallest cotton farms had fewer than 200 cotton acres in 1997; only 8 percent of very large family cotton farms had fewer than 200 cotton acres.



Source: 1997 Agricultural Resource Management Study, cotton version

Most cotton on very large family farms was planted in May. The two farm-occupation groups had the most growers using skip row production—the most common skip pattern was plant two rows skip one. The largest proportion of small and low-sales farms harvested in November, while the largest proportions of the other groups harvested in October.

The low-sales group had the lowest percentage of farms using chemicals, and they made only one trip across the field to apply chemicals. The nonfamily group had the highest percentage of farms using chemicals, and they made five trips across the field. There was no significant difference in the proportions of farms using fertilizers, but other small farms made two trips across the field to apply fertilizers compared with more than four trips by very large family farms.

Custom operations were used most commonly on other small farms. Compared with other farm sizes, significantly higher proportions of other small farms used custom operations throughout the production process. Other small farm operators used custom seeding (38 percent), cultivating (37 percent), application of chemicals (62 percent), fertilizers (57 percent), and harvesting (58 percent). They used significantly less custom scouting (19 percent) and soil testing (8 percent).

Other small farm operators were more likely to rely on standard practices as the basis for applying insecticides while very large family and nonfamily farm operators most often relied on scouting data. Scouting and soil tests were much more commonly used by larger farm operations.

Both nonfamily and other small farms owned more than 60 percent of their land. For low-sales, high-sales, and large family farms, 48-54 percent of land was share rented. Very large family farms had a higher proportion of land rented than owned. Larger farms were more likely to irrigate.

Most farms were sole proprietorships, although 28 percent of very large family farms were partnerships, and 41 percent of nonfamily farms were corporations. Half the operators of other

small farms were retired or had a nonfarm occupation, as did 91 percent of nonfamily farms. This is largely an artifact of the definitions of the groups. The other small farms group is comprised of operators who reported nonfarm occupations (retirement, residential/lifestyle, limited-resource). Of the three groups, only the limited-resource group is likely to list a farm occupation. The nonfamily group is comprised of nonfamily corporations and hired managers.

Cost group:

Low-cost producers are the 25 percent of U.S. cotton producers with the lowest per-pound costs. These producers had total costs of 64 cents per pound or less.

High-cost producers are the 25 percent of U.S. cotton producers with the highest per-pound costs. These producers had total costs of 92 cents per pound or more.

Enterprise size categories are specified as farms with fewer than 200 cotton acres, 200-499 cotton acres, 500-999 cotton acres, 1,000-1,499 cotton acres, and 1,500 cotton acres or more.

Expected yield is the cotton yield per acre that farmers reported that they expect on their operation at the beginning of the growing season.

Expected price is the price that farmers reported that they expected to receive at the beginning of the season.

Financial condition describes the financial health of a farm from a combination of net farm income and solvency (debt/asset ratio). Farms are categorized into one of four classes:

Favorable: positive income and debt/asset ratio less than 0.40. These farms are generally considered financially stable.

Marginal income: negative income and a debt/asset ratio less than 0.40. Periods of negative income may not pose financial difficulties if these farms are carrying a low debt load and can either borrow against equity or obtain income from off-farm sources.

Marginal solvency: positive income and a debt/asset ratio above 0.40. A high debt/asset ratio may be acceptable if

these farms can generate enough income to service their debt and meet other financial obligations.

Vulnerable: negative income and a debt/asset ratio above 0.40. These farms are generally considered financially unstable.

Farm typology categorizes farms based on the occupation of operators and the sales class of farms. Farms are categorized into eight groups. Due to sample size limitations the three smallest classes have been combined into one group as defined below.

Other small family farms combines limited-resource, retirement, and residential/lifestyle farms. Limited-resource farms have sales less than \$100,000, total farm assets less than \$150,000, and total operator household income less than \$20,000. They may report farming, a nonfarm occupation, or retirement as their major occupation. Retirement farms have sales less than \$250,000. These operators report they are retired (excludes limited-resource farms operated by retired farmers). Residential/lifestyle farms have sales less than \$250,000 and the operators report a major occupation other than farming (excludes limited-resource farms with operators reporting a nonfarm major occupation).

Farming occupation/low-sales farms have sales less than \$100,000 and the operators report farming as their major occupation (excludes limited-resource farms whose operators report farming as their major occupation).

Farming occupation/high-sales farms have sales between \$100,000 and \$249,999, and the operators report farming as their major occupation.

Large family farms have sales between \$250,000-499,999.

Very large family farms have sales of \$500,000 or more.

Nonfamily farms are farms organized as nonfamily corporations or cooperatives, as well as farms operated by hired managers.

Operating costs represent the costs for purchased inputs that are consumed in one production period. These costs include seed, fertilizer, chemicals, custom operations, fuel, lube, and electricity, repairs, purchased irrigation water, interest on operating inputs, and ginning.

Ownership costs include operating costs, hired labor, taxes and insurance, and an imputed cost for capital recovery.

Total costs include operating costs, paid and unpaid labor charges, an imputed cost for capital recovery, the opportunity cost of land, and the enterprise share of taxes and insurance and general farm overhead.

Transgenic seed includes seed that has been genetically modified to be herbicide tolerant or insect resistant.

References

Heimlich, Ralph. *Farm Resource Regions*.
From the web site of the Economic Research
Service

(<http://www.ers.usda.gov/publications/aib760/>).
U.S. Dept. Agr., Econ. Res. Serv. Updated
August 2000.

Hoppe, Robert, Janet Perry, and David Banker.
“ERS Farm Typology: Classifying a Diverse Ag
Sector.” *Agricultural Outlook*. pp. 11-13. U.S.
Dept. Agr., Econ. Res. Serv. November 1999.

Huffman, Wallace E. “Human Capital, Adaptive
Ability, and the Distributional Implications of
Agricultural Policy.” *American Journal of*

Agricultural Economics. Vol. 67, pp. 429-34.
May 1985.

U.S. Department of Agriculture, Economic
Research Service. *Cotton Costs and Returns*.
From the web site of the Economic Research
Service
(<http://www.ers.usda.gov/Data/CostsAndReturns/car/cotton2.htm>). U.S. Dept. Agr., Econ. Res.
Serv. Updated 2001.

_____, National Agricultural Statistics
Service. *1997 Agricultural Resource
Management Study Phase III: Survey
Administration Manual*. January 1998.

Defining Cost Groups

In the past, ERS issued reports analyzing characteristics of low-cost and high-cost producers of selected commodities. In those reports, variable costs were used as the basis for defining the cost groups. This subset of costs was used so that only directly observed costs were used rather than assumptions about the allocation of costs. However, disregarding the effect of overhead costs, which reflect the influence of management decisions, can distort the analysis. Management decisions have as much influence on capital items as on expendable items. Human capital, including allocative ability and time of an individual are inseparable and jointly allocated (Huffman, 1985). Disregarding the costs of labor, or including paid but not unpaid labor, may bias the analysis for commodities that are labor intensive. Other management decisions, such as the decision to rent land, may alter decisions about capital improvements to that land, as well as ownership of the commodity in share arrangements. There are different risks inherent with owned and rented land, each requiring different management strategies.

Some commodity reports have also used operating costs plus a subset of allocated overhead costs to represent ownership costs. In this case, hired labor, taxes and insurance, and capital recovery are added to operating costs. This approximates a level required to stay in

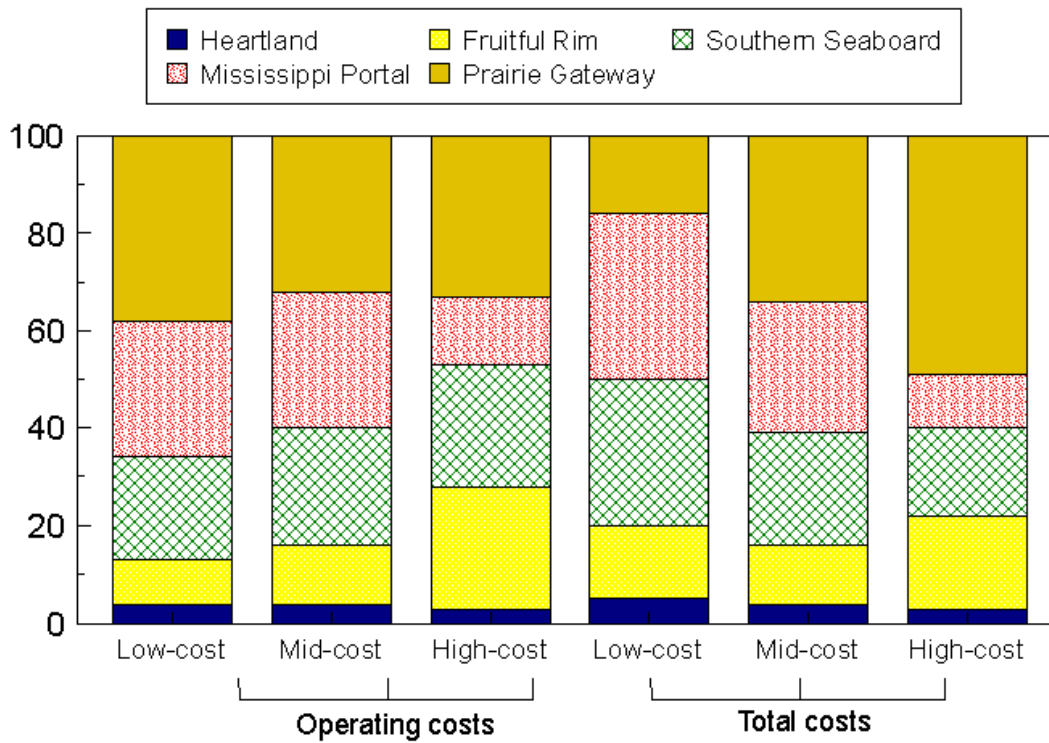
business whereas operating costs are shortrun costs.

Total costs account for the costs of both expendable and capital items. Costs of using capital items are allocated to the enterprise based on the amount of use and are associated with the entire farm business. Total costs represent the level required to reward all the factors of production and keep them in agricultural production over the longer term.

Regional distributions of farms by cost group differ depending on which set of costs is used. For example, in the Prairie Gateway, the proportion of farms declines as you move from low- to high-cost based on operating costs alone. When total costs are used as the basis for the cost group designation, the proportion of farms increases as you move from low- to high-cost ([app. fig. 1](#)). For cotton, ownership patterns change as you move from the west to the east along the entire southern United States. The distribution of farms is very sensitive to these changes. For corn and soybeans, there is a more homogeneous ownership pattern, and the distribution is less sensitive to the definition of cost groups. For this reason, total costs were used in this report. To compare cotton with other crops in future reports issued by ERS, a set of tables using ownership costs as the definition for cost groups has been included in this [appendix](#).

Appendix figure 1

Regional distributions differ depending on basis used for cost groups.



Source: 1997 Agricultural Resource Management Study, cotton version

Appendix

Appendix table 1—Characteristics of ARMS cotton farms, by total cost group, 1997¹

Item	Low-cost	Mid-cost	High-cost	All ARMS farms
Cotton acreage:				
		Percent of acres		
Percent owned	45	33	27	35
Percent cash-rented	29	25	18	25
Percent share-rented	27	43	54	40
Percent dryland	72	62	78	68
Percent irrigated	28	38	22	32
Production specialty:				
		Percent of farms		
Cotton	59	54	53	55
Cash grain	13	11	7	11
Other crop	25	31	37	31
Livestock	3	3	2	3
Enterprise size:				
Less than 200 acres	32	39	41	38
200-499 acres	27	29	29	28
500-999 acres	25	19	22	21
1,000-1,499 acres	7	8	5	7
1,500 acres or more	8	5	3	5
Region:				
Heartland	5	4	2	4
Prairie Gateway	16	34	49	33
Southern Seaboard	29	23	18	24
Fruitful Rim	15	11	19	14
Mississippi Portal	33	27	11	24
Farm typology:				
Other small farms	19	20	22	20
Farm occupation/low-sales	13	13	20	15
Farm occupation/high-sales	16	21	21	20
Large family	17	23	17	20
Very large family	27	19	12	19
Nonfamily	7	4	8	6
Operator age:				
Less than 35	8	7	8	8
35-44	23	21	25	22
45-54	25	27	31	27
55-64	28	25	24	26
65 or older	16	20	12	17
Operator education:				
Less than high school	6	7	16	9
High school diploma	39	37	30	36
Some college	34	27	30	30
Bachelor's degree	13	27	20	21
Graduate school	8	2	4	4
Type of organization:				
Sole proprietorship	78	81	81	80
Partnership	15	13	10	13
Corporation	5	6	8	6
Major occupation:				
Farming	84	79	77	80
Retired and other	12	18	20	17
Income solvency group:				
Favorable	70	69	55	65
Marginal solvency	10	13	20	14
Marginal income	16	14	15	15
Vulnerable	4	6	11	6

¹Data may not add due to rounding or omission of possible categories.

Appendix

Appendix table 2—Characteristics of ARMS cotton farms, by enterprise size, 1997¹

Item	Less than 200	200- 499	500- 999	1,000- 1,499	1,500 or more
Cotton acreage:					
	Percent of acres				
Percent owned	48	39	35	24	37
Percent cash-rented	32	31	28	21	16
Percent share-rented	20	30	37	56	47
Percent dryland	71	73	68	72	60
Percent irrigated	29	27	32	28	40
Production specialty:					
	Percent of farms				
Cotton	41	53	67	79	90
Cash grain	14	12	8	5	0
Other crop	42	32	23	14	10
Livestock	4	3	2	2	0
Total cost group:					
Low-cost	21	24	30	25	38
Mid-cost	51	51	44	58	49
High-cost	27	25	26	17	13
Region:					
Heartland	5	3	3	4	5
Prairie Gateway	31	34	33	39	42
Southern Seaboard	24	27	22	22	10
Fruitful Rim	13	14	16	11	21
Mississippi Portal	27	22	24	23	21
Farm typology:					
Other small farms	48	7	0	0	0
Farm occupation/low-sales	19	19	8	2	8
Farm occupation/high-sales	17	23	20	18	17
Large family	9	27	31	27	13
Very large family	4	18	35	37	45
Nonfamily	3	6	5	17	16
Operator age:					
Less than 35	7	8	10	5	5
35-44	13	29	29	27	20
45-54	27	28	23	38	32
55-64	22	25	31	24	31
65 or older	31	10	7	6	12
Operator education:					
Less than high school	15	5	8	0	1
High school diploma	37	39	29	34	46
Some college	23	30	38	37	29
Bachelor's degree	22	21	20	27	23
Graduate school	4	5	6	2	1
Type of organization:					
Sole proprietorship	91	81	74	63	50
Partnership	6	11	18	25	34
Corporation	3	6	8	12	16
Major occupation:					
Farming	67	88	92	77	79
Retired and other	26	11	7	23	20
Income solvency group:					
Favorable	73	64	54	50	82
Marginal solvency	10	13	21	24	4
Marginal income	10	18	19	16	11
Vulnerable	7	5	6	10	3

¹Data may not add due to rounding or omission of possible categories.

Appendix

Appendix table 3—Characteristics of ARMS cotton farms, by region, 1997¹

Item	Heartland	Prairie Gateway	Southern Seaboard	Fruitful Rim	Mississippi Portal
Cotton acreage:					
		Percent of acres			
Percent owned	27	30	35	58	27
Percent cash-rented	21	5	60	24	26
Percent share-rented	52	65	6	19	47
Percent dryland	66	71	88	27	74
Percent irrigated	34	29	12	73	26
Production specialty:					
		Percent of farms			
Cotton	53	67	39	51	57
Cash grain	21	9	5	7	19
Other crop	25	22	51	38	23
Livestock	0	2	6	5	1
Enterprise size:					
Less than 200 acres	50	35	38	34	42
200-499 acres	20	29	33	27	26
500-999 acres	14	21	20	24	21
1,000-1,499 acres	9	9	7	6	7
1,500 acres or more	7	7	2	8	5
Total cost group					
Low-cost	32	12	31	26	34
Mid-cost	52	51	50	40	55
High-cost	16	37	19	34	11
Farm typology:					
Other small farms	27	26	14	12	22
Farm occupation/low-sales	5	22	13	9	12
Farm occupation/high-sales	14	24	19	15	17
Large family	29	16	22	21	23
Very large family	24	8	28	27	21
Nonfamily	0	4	3	17	5
Operator age:					
Less than 35	7	7	7	4	11
35-44	18	19	30	16	23
45-54	30	27	26	28	29
55-64	27	27	23	24	27
65 or older	17	20	14	28	10
Operator education:					
Less than high school	15	11	8	13	5
High school diploma	40	30	41	32	40
Some college	10	25	34	30	34
Bachelor's degree	29	29	14	20	17
Graduate school	5	5	3	4	4
Type of organization:					
Sole proprietorship	89	86	85	57	79
Partnership	5	10	11	20	18
Corporation	6	3	4	22	3
Major occupation:					
Farming	96	76	80	79	82
Retired and other	0	23	16	19	12
Income solvency group:					
Favorable	84	67	58	75	63
Marginal solvency	16	9	20	13	14
Marginal income	0	16	15	9	18
Vulnerable	0	8	7	3	5

¹Data may not add due to rounding or omission of possible categories.

Appendix

Appendix table 4—Characteristics of ARMS cotton farms, by typology group, 1997¹

Item	Other small	Farm occupation low-sales	Farm occupation high-sales	Large family	Very large family	Non-family
Cotton acreage:			Percent of acres			
Percent owned	61	30	36	27	28	67
Percent cash-rented	21	16	16	25	37	10
Percent share-rented	18	54	48	48	35	23
Percent dryland	73	89	80	66	65	40
Percent irrigated	27	11	20	34	35	60
Production specialty:			Percent of farms			
Cotton	57	61	61	55	42	57
Cash grain	7	7	13	15	11	6
Other crop	36	30	26	26	37	36
Livestock	0	1	<1	4	10	1
Enterprise size:						
Less than 200 acres	89	48	33	17	8	17
200-499 acres	11	36	33	37	26	28
500-999 acres	0	12	22	32	39	18
1,000-1,499 acres	0	1	7	9	14	22
1,500 acres or more	0	3	5	4	13	15
Region:						
Heartland	5	1	3	5	5	0
Prairie Gateway	43	49	41	27	13	22
Southern Seaboard	17	20	23	26	35	14
Fruitful Rim	8	8	11	14	20	43
Mississippi Portal	26	20	21	27	26	21
Total cost group:						
Low-cost	23	21	21	21	36	32
Mid-cost	50	45	52	57	49	35
High-cost	27	34	27	22	15	33
Operator age:						
Less than 35	5	3	7	14	9	1
35-44	13	18	25	29	30	9
45-54	20	32	23	28	33	33
55-64	17	29	36	22	19	45
65 or older	45	18	8	7	9	12
Operator education:						
Less than high school	18	11	6	4	6	9
High school diploma	32	40	37	44	29	25
Some college	14	38	32	32	34	30
Bachelor's degree	31	10	20	17	24	28
Graduate school	5	2	4	3	6	8
Type of organization:						
Sole proprietorship	93	97	87	74	63	44
Partnership	5	2	10	21	28	7
Corporation	2	1	3	5	9	41
Major occupation:						
Farming	36	100	100	93	96	9
Retired and other	50	0	0	6	3	91
Income solvency group:						
Favorable	72	70	65	59	63	63
Marginal solvency	12	11	20	12	11	23
Marginal income	9	12	9	21	24	11
Vulnerable	7	7	6	8	2	3

¹Data may not add due to rounding or omission of possible categories.

Appendix

Appendix table 5—Input use by ARMS cotton farms, by total cost group, 1997¹

Item	Unit	Low-cost	Mid-cost	High-cost	All ARMS farms
Planting month:					
March	percent of farms	3	5	2	4
April	percent of farms	30	20	26	24
May	percent of farms	65	73	62	68
June	percent of farms	2	3	10	5
Planting:					
Conventional	percent of farms	83	88	100	90
No-till	percent of farms	7	6	7	7
Solid row	percent of farms	91	89	83	88
Skip row	percent of farms	9	11	17	12
Skip patterns					
Plant 2 / skip 1	percent of farms	73	80	67	74
Plant 2 / skip 2	percent of farms	0	6	8	5
Plant 4 / skip 2	percent of farms	6	1	8	4
Plant 8 / skip 1	percent of farms	15	12	11	12
Seed:					
Rate-one time	pounds per acre	12.57	13.61	15.43	13.68
Percent homegrown seed	percent	13	23	21	20
Percent purchased seed	percent	87	77	79	80
Percent herbicide resistant	percent	7	6	8	7
Percent Bt	percent	18	16	13	16
Fuel use:					
Diesel	gallons per acre	19	19	23	20
Electric	Kilowatt hours per acre	43	46	157	68
Gas	gallons per acre	4	5	6	5
LP Gas	gallons per acre	0.1	0.1	7	2
Custom operations:					
Chemical application	percent of farms	43	44	40	43
Cultivation	percent of farms	11	11	7	10
Fertilizer application	percent of farms	37	44	28	39
Harvesting	percent of farms	31	30	25	29
Land preparation	percent of farms	5	10	3	7
Scouting	percent of farms	52	43	28	42
Seeding	percent of farms	11	11	7	10
Soil testing	percent of farms	21	18	14	18
Harvesting month:					
August	percent of farms	2	2	2	2
September	percent of farms	4	4	4	4
October	percent of farms	45	42	36	41
November	percent of farms	27	41	39	37
December	percent of farms	1	3	5	3
Harvesting machinery:					
Picker	percent of farms	61	51	35	50
Stripper	percent of farms	10	30	51	30
Module builder	percent of farms	17	34	29	28

¹Data may not add due to rounding or omission of possible categories.

Appendix

Appendix table 6—Input use by ARMS cotton farms, by enterprise size, 1997¹

Item	Unit	Less than 200	200- 499	500- 999	1,000- 1,499	1,500 or more
Planting month:						
March	percent of farms	3	3	5	3	7
April	percent of farms	25	22	24	18	26
May	percent of farms	68	72	63	77	59
June	percent of farms	4	3	7	2	8
Planting:						
Conventional	percent of farms	76	99	95	100	100
No-till	percent of farms	7	8	9	5	2
Solid row	percent of farms	95	82	87	84	74
Skip row	percent of farms	5	18	13	16	26
Skip patterns						
Plant 2 / skip 1	percent of farms	74	75	73	68	80
Plant 2 / skip 2	percent of farms	0	13	0	0	0
Plant 4 / skip 2	percent of farms	26	0	1	0	4
Plant 8 / skip 1	percent of farms	0	13	11	32	9
Seed:						
Rate-one time	pounds per acre	13.93	13.25	13.39	12.99	14.78
Percent homegrown seed	percent	8	17	12	28	28
Percent purchased seed	percent	92	83	88	72	72
Percent herbicide resistant	percent	6	6	9	12	3
Percent Bt	percent	15	16	15	18	14
Fuel use:						
Diesel	gallons per acre	15	21	20	20	19
Electric	Kilowatt hours per acre	43	66	84	29	83
Gas	gallons per acre	9	5	5	4	3
LP Gas	gallons per acre	0.1	0.1	0.2	<.1	6
Custom operations:						
Chemical application	percent of farms	47	42	39	40	36
Cultivation	percent of farms	23	4	1	3	0
Fertilizer application	percent of farms	49	33	35	24	28
Harvesting	percent of farms	50	19	11	14	11
Land preparation	percent of farms	13	5	1	4	0
Scouting	percent of farms	30	47	48	60	49
Seeding	percent of farms	22	6	1	0	0
Soil testing	percent of farms	11	19	21	31	19
Harvesting month:						
August	percent of farms	2	2	3	0	5
September	percent of farms	4	3	4	3	5
October	percent of farms	32	48	42	54	52
November	percent of farms	44	33	35	33	22
December	percent of farms	2	2	4	2	9
Harvesting machinery:						
Picker	percent of farms	32	52	58	62	65
Stripper	percent of farms	10	32	38	76	70
Module builder	percent of farms	5	35	39	64	68

¹Data may not add due to rounding or omission of possible categories.

Appendix

Appendix table 7—Input use by ARMS cotton farms, by region, 1997¹

Item	Unit	Heartland	Prairie Gateway	Southern Seaboard	Fruitful Rim	Mississippi Portal
Planting month:						
March	percent of farms	0	1	1	22	0
April	percent of farms	18	7	33	63	16
May	percent of farms	82	80	64	14	84
June	percent of farms	0	12	2	0	0
Planting:						
Conventional	percent of farms	75	95	87	79	96
No-till	percent of farms	5	3	14	5	6
Solid row	percent of farms	100	65	100	100	98
Skip row	percent of farms	0	35	0	0	2
Skip patterns						
Plant 2 / skip 1	percent of farms	0	76	0	0	53
Plant 2 / skip 2	percent of farms	0	6	0	0	0
Plant 4 / skip 2	percent of farms	0	3	100	0	23
Plant 8 / skip 1	percent of farms	0	12	0	0	0
Seed:						
Rate-one time	pounds per acre	12.51	16.62	9.45	15.91	11.21
Percent homegrown seed	percent	3	39	0	7	2
Percent purchased seed	percent	97	61	100	93	98
Percent herbicide resistant	percent	5	4	10	2	11
Percent Bt	percent	0	2	22	34	9
Fuel use:						
Diesel	gallons per acre	17	18	20	26	19
Electric	Kilowatt hours per acre	0	57	13	246	18
Gas	gallons per acre	3	5	4	5	5
LP Gas	gallons per acre	0	4	0.1	<.1	0.1
Custom operations:						
Chemical application	percent of farms	44	54	25	55	39
Cultivation	percent of farms	11	17	5	21	0
Fertilizer application	percent of farms	31	36	43	46	32
Harvesting	percent of farms	27	31	33	44	15
Land preparation	percent of farms	1	15	0	14	0
Scouting	percent of farms	27	20	59	40	60
Seeding	percent of farms	19	18	4	17	0
Soil testing	percent of farms	10	12	20	24	20
Harvesting month:						
August	percent of farms	0	1	0	12	0
September	percent of farms	2	3	6	5	2
October	percent of farms	77	28	29	48	62
November	percent of farms	7	56	44	12	24
December	percent of farms	0	6	2	5	0
Harvesting machinery:						
Picker	percent of farms	69	4	61	48	97
Stripper	percent of farms	0	86	3	7	0
Module builder	percent of farms	8	60	10	6	19

¹Data may not add due to rounding or omission of possible categories.

Appendix

Appendix table 8—Input use by ARMS cotton farms, by typology, 1997¹

Item	Unit	Other small	Farm occupation		Large family	Very large family	Nonfamily
			low-sales	high-sales			
Planting month:							
March	percent of farms	0	1	2	5	8	8
April	percent of farms	19	16	26	22	28	46
May	percent of farms	75	78	63	70	63	46
June	percent of farms	6	6	9	2	1	0
Planting:							
Conventional	percent of farms	61	100	100	98	90	94
No-till	percent of farms	4	5	13	8	6	2
Solid row	percent of farms	91	69	79	97	97	95
Skip row	percent of farms	9	31	21	3	3	5
Skip patterns							
Plant 2 / skip 1	percent of farms	83	70	76	80	47	90
Plant 2 / skip 2	percent of farms	0	14	0	0	0	0
Plant 4 / skip 2	percent of farms	17	3	0	0	0	10
Plant 8 / skip 1	percent of farms	0	14	16	20	0	0
Seed:							
Rate-one time	pounds per acre	15.43	14.91	14.55	13.55	12.29	14.96
Percent homegrown seed	percent	17	30	26	30	9	4
Percent purchased seed	percent	83	70	74	70	91	96
Percent herbicide resistant	percent	4	9	6	7	12	12
Percent Bt	percent	40	14	14	19	21	19
Fuel use:							
Diesel	gallons per acre	11	18	19	20	22	20
Electric	Kilowatt hours per acre	33	4	29	68	115	63
Gas	gallons per acre	7	5	5	5	4	4
LP Gas	gallons per acre	0.2	0.1	8	<.1	0.2	0
Custom operations:							
Chemical application	percent of farms	62	28	39	41	39	44
Cultivation	percent of farms	37	5	3	2	4	7
Fertilizer application	percent of farms	57	26	34	37	34	42
Harvesting	percent of farms	58	29	19	21	15	29
Land preparation	percent of farms	25	0	2	1	3	13
Scouting	percent of farms	19	31	38	53	63	52
Seeding	percent of farms	38	4	1	1	3	9
Soil testing	percent of farms	8	15	16	21	23	35
Harvesting month:							
August	percent of farms	0	2	2	5	2	4
September	percent of farms	2	3	4	3	6	4
October	percent of farms	29	29	48	39	53	58
November	percent of farms	51	56	28	31	25	27
December	percent of farms	0	6	9	0	2	1
Harvesting machinery:							
Picker	percent of farms	27	37	51	50	79	59
Stripper	percent of farms	11	55	41	39	14	19
Module builder	percent of farms	6	37	41	40	27	9

¹Data may not add due to rounding or omission of possible categories.

Appendix

Appendix table 9—Chemical use and testing by ARMS cotton farms, by total cost group, 1997¹

Item	Unit	Low-cost	Mid-cost	High-cost	All ARMS farms
Chemical use:					
Insecticides	percent of farms	85	80	75	80
Herbicides	percent of farms	96	97	97	97
Fungicides	percent of farms	9	7	3	6
Nematicides	percent of farms	78	79	58	73
Chemical use:					
Insecticides	times-over	2.76	2.40	2.30	2.49
Herbicides	times-over	3.88	3.53	2.50	3.42
Fungicides	times-over	0.20	0.10	0.10	0.13
Nematicides	times-over	2.13	1.97	1.60	1.94
Reasons for herbicide applications:					
Pre-emergent					
Routine practice	percent of farms	86	83	91	86
Field map	percent of farms	7	8	3	6
Recommendations by:					
Chemical dealer	percent of farms	11	23	9	16
Crop consultant	percent of farms	13	7	4	8
Post-emergent					
Routine treatment	percent of farms	43	44	26	39
Weed type/density	percent of farms	39	43	38	41
Recommendations by:					
Chemical dealer	percent of farms	13	11	10	11
Crop consultant	percent of farms	13	6	4	7
Reasons for insecticide applications:					
Preventive schedule	percent of farms	33	31	25	30
Boll weevil trapping targets	percent of farms	12	16	16	15
Scouting data	percent of farms	44	34	29	35
Standard practices/history	percent of farms	27	28	21	26
Local information of presence	percent of farms	9	5	7	6
Operators determination	percent of farms	36	40	37	38
Testing:					
Soil test	percent of farms	51	43	33	42
Plant tissue test	percent of farms	11	6	7	8
Nitrogen test	percent of farms	26	22	21	23
Nitrogen applications:					
Less than recommended	percent of farms	28	24	22	25
More than recommended	percent of farms	6	16	12	12
Equal to recommendations	percent of farms	67	60	66	63

¹Data may not add due to rounding or omission of possible categories.

Appendix

Appendix table 10—Chemical use and testing by ARMS cotton farms, by enterprise size, 1997¹

Item	Unit	Less than 200	200- 499	500- 999	1,000- 1,499	1,500 or more
Chemical use:						
Insecticides	percent of farms	82	77	81	81	71
Herbicides	percent of farms	98	95	96	97	99
Fungicides	percent of farms	5	6	7	7	9
Nematicides	percent of farms	72	70	76	83	84
Chemical use:						
Insecticides	times-over	2.23	1.80	2.27	2.49	3.35
Herbicides	times-over	3.03	3.24	3.39	3.67	3.51
Fungicides	times-over	0.08	0.09	0.12	0.13	0.19
Nematicides	times-over	1.55	1.47	1.91	2.24	2.22
Reasons for herbicide applications:						
Pre-emergent						
Routine practice	percent of farms	80	94	85	77	97
Field map	percent of farms	9	5	6	6	1
Recommendations by:						
Chemical dealer	percent of farms	25	12	12	10	5
Crop consultant	percent of farms	5	5	12	9	15
Post-emergent						
Routine treatment	percent of farms	37	44	35	38	48
Weed type/density	percent of farms	38	41	44	45	39
Recommendations by:						
Chemical dealer	percent of farms	10	11	14	7	8
Crop consultant	percent of farms	3	7	12	12	14
Reasons for insecticide applications:						
Preventive schedule	percent of farms	31	28	33	24	33
Boll weevil trapping targets	percent of farms	13	15	17	22	12
Scouting data	percent of farms	33	31	36	54	43
Standard practices/history	percent of farms	36	20	20	18	11
Local information of presence	percent of farms	6	7	8	6	5
Operators determination	percent of farms	30	43	45	39	38
Testing:						
Soil test	percent of farms	29	50	49	66	40
Plant tissue test	percent of farms	4	10	8	14	13
Nitrogen test	percent of farms	17	23	27	40	26
Nitrogen applications:						
Less than recommended	percent of farms	27	28	21	27	6
More than recommended	percent of farms	14	13	4	18	24
Equal to recommendations	percent of farms	59	60	76	55	70

¹Data may not add due to rounding or omission of possible categories.

Appendix

Appendix table 11—Chemical use and testing by ARMS cotton farms, by region, 1997¹

Item	Unit	Heartland	Prairie Gateway	Southern Seaboard	Fruitful Rim	Mississippi Portal
Chemical use:						
Insecticides	percent of farms	60	66	90	92	84
Herbicides	percent of farms	100	97	99	97	94
Fungicides	percent of farms	17	0	5	3	16
Nematicides	percent of farms	100	57	77	86	82
Chemical use:						
Insecticides	times-over	1.05	1.29	1.91	4.33	3.91
Herbicides	times-over	5.77	2.31	4.26	2.14	5.05
Fungicides	times-over	0.37	0.00	0.12	0.04	0.36
Nematicides	times-over	2.42	1.24	1.98	2.87	2.34
Reasons for herbicide applications:						
Pre-emergent						
Routine practice	percent of farms	94	85	91	82	84
Field map	percent of farms	13	0	4	9	12
Recommendations by:						
Chemical dealer	percent of farms	37	15	10	14	21
Crop consultant	percent of farms	13	1	11	9	10
Post-emergent						
Routine treatment	percent of farms	88	18	49	34	55
Weed type/density	percent of farms	47	29	39	39	58
Recommendations by:						
Chemical dealer	percent of farms	42	2	7	13	21
Crop consultant	percent of farms	12	0	12	7	12
Reasons for insecticide applications:						
Preventive schedule	percent of farms	54	18	31	33	39
Boll weevil trapping targets	percent of farms	23	16	9	12	21
Scouting data	percent of farms	18	14	50	48	46
Standard practices/history	percent of farms	40	17	20	41	32
Local information of presence	percent of farms	23	4	5	4	10
Operators determination	percent of farms	33	29	38	48	45
Testing:						
Soil test	percent of farms	13	23	74	33	47
Plant tissue test	percent of farms	2	4	6	23	7
Nitrogen test	percent of farms	11	15	29	28	27
Nitrogen applications:						
Less than recommended	percent of farms	72	19	34	8	23
More than recommended	percent of farms	0	22	8	19	7
Equal to recommendations	percent of farms	28	60	58	73	70

¹Data may not add due to rounding or omission of possible categories.

Appendix

Appendix table 12—Chemical use and testing by ARMS cotton farms, by typology, 1997¹

Item	Unit	Other small	Farm occupation		Large family	Very large family	Nonfamily
			low-sales	high-sales			
Chemical use:							
Insecticides	percent of farms	81	67	71	86	88	90
Herbicides	percent of farms	97	98	96	96	98	99
Fungicides	percent of farms	6	3	7	5	10	6
Nematicides	percent of farms	73	57	64	79	88	81
Chemical use:							
Insecticides	times-over	1.36	1.21	1.24	2.39	3.11	4.70
Herbicides	times-over	2.49	2.62	2.78	3.43	4.30	2.90
Fungicides	times-over	0.08	0.04	0.08	0.09	0.23	0.09
Nematicides	times-over	1.17	0.97	1.00	2.02	2.48	2.96
Reasons for herbicide applications:							
Pre-emergent							
Routine practice	percent of farms	75	92	92	86	87	84
Field map	percent of farms	9	5	6	4	5	12
Recommendations by:							
Chemical dealer	percent of farms	29	12	14	15	12	10
Crop consultant	percent of farms	1	5	5	8	15	16
Post-emergent							
Routine treatment	percent of farms	28	41	37	46	45	38
Weed type/density	percent of farms	32	38	47	39	45	49
Recommendations by:							
Chemical dealer	percent of farms	3	14	13	14	14	4
Crop consultant	percent of farms	1	4	7	7	18	6
Reasons for insecticide applications:							
Preventive schedule	percent of farms	30	26	23	31	35	44
Boll weevil trapping targets	percent of farms	9	14	15	21	16	15
Scouting data	percent of farms	19	24	35	38	48	65
Standard practices/history	percent of farms	46	13	18	21	24	37
Local information of presence	percent of farms	4	3	6	7	11	6
Operators determination	percent of farms	28	33	35	46	45	51
Testing:							
Soil test	percent of farms	23	32	42	54	55	53
Plant tissue test	percent of farms	0	2	10	8	11	28
Nitrogen test	percent of farms	10	19	26	26	30	34
Nitrogen applications:							
Less than recommended	percent of farms	31	28	30	20	29	0
More than recommended	percent of farms	10	18	8	13	8	28
Equal to recommendations	percent of farms	59	55	63	67	64	72

¹Data may not add due to rounding or omission of possible categories.

Appendix

Appendix table 13—Characteristics of cotton farms, by ownership cost group, 1997

Item	Units	Low-cost	Mid-cost	High-cost	All ARMS Farms
Share of ARMS:					
Cotton farms	Percent	25	50	25	100
Cotton production	Percent	29	56	15	100
Lint yield – actual	Pounds	800	748	505	711
Lint yield – expected	Pounds	761	783	656	751
Total acreage operated	Acres	1,350	1,194	1,149	1,222
Planted cotton acreage	Acres	491	496	392	469
Farm value of production	Dollars per farm	441,303	485,741	489,143	475,540
Cotton value of production	Dollars per farm	225,770	227,798	165,194	211,622
Cotton under contract	Percent of value	14	15	10	13
Expected price at planting	Dollars per pound	.699	.685	.696	.691
Harvest month price	Dollars per pound	.686	.691	.686	.689

Appendix table 14—Historical cotton production costs and returns per planted acre, by ownership cost group, 1997

	Low-cost	Mid-cost	High-cost	All ARMS farms
Dollars				
Costs per pound of lint:				
Operating costs, actual yield	.29	.38	.58	.38
Ownership costs, actual yield	.43	.58	.94	.59
Total costs, actual yield	.56	.72	1.11	.73
Costs and returns per acre:				
Gross value of production	627.07	591.05	398.71	560.18
Total operating costs:	230.99	280.85	291.84	270.17
Seed	15.00	18.08	18.75	17.42
Fertilizer	29.40	37.01	37.13	35.05
Chemicals	44.29	68.15	66.74	61.64
Custom operations	19.31	19.03	20.53	19.42
Fuel, lube, electricity	21.39	26.66	52.37	30.67
Repairs	20.63	26.86	29.13	25.71
Purchased irrigation water	3.04	11.32	12.64	9.44
Interest on operating inputs	5.60	6.83	7.09	6.56
Ginning	72.33	66.91	47.48	64.26
Total allocated overhead:	216.82	254.62	269.18	247.82
Hired labor	25.46	42.00	58.82	41.21
Opportunity cost of unpaid labor	34.06	29.65	31.85	31.26
Capital recovery of machinery & equipment	75.70	99.98	109.45	95.64
Opportunity cost of land	57.58	53.91	35.25	50.96
Taxes and insurance	12.50	13.96	17.55	14.33
General farm overhead	11.51	15.11	16.28	14.42
Ownership costs	344.65	436.79	477.66	421.35
Total costs	447.81	535.47	561.02	517.99
Returns above operating costs	396.08	310.20	106.87	290.01
Returns above total costs	179.26	55.58	-162.31	42.19

Appendix

Appendix table 15—Characteristics of ARMS cotton farms, by ownership cost group, 1997¹

Item	Low-cost	Mid-cost	High-cost	All ARMS farms
Percent of acres				
Cotton acreage:				
Percent owned	34	35	37	35
Percent cash-rented	23	26	24	25
Percent share-rented	43	39	40	40
Percent dryland	80	64	64	68
Percent irrigated	20	36	36	32
Percent of farms				
Production specialty:				
Cotton	62	53	52	55
Cash grain	14	12	5	11
Other crop	21	32	40	31
Livestock	3	3	3	3
Enterprise size:				
Less than 200 acres	36	37	42	38
200-499 acres	31	29	25	28
500-999 acres	20	19	26	21
1,000-1,499 acres	5	10	4	7
1,500 acres or more	8	6	2	5
Region:				
Heartland	7	2	3	4
Prairie Gateway	27	31	43	33
Southern Seaboard	26	25	18	24
Fruitful Rim	9	14	18	14
Mississippi Portal	29	26	16	24
Farm typology:				
Other small farms	23	17	23	20
Farm occupation/low-sales	17	15	12	15
Farm occupation/high-sales	19	21	17	20
Large family	15	22	22	20
Very large family	20	19	18	19
Nonfamily	6	5	8	6
Operator age:				
Less than 35	6	8	8	8
35-44	22	22	23	22
45-54	26	27	29	27
55-64	33	21	28	26
65 or older	12	22	11	17
Operator education:				
Less than high school	7	7	14	9
High school diploma	43	36	30	36
Some college	30	28	32	30
Bachelor's degree	14	27	18	21
Graduate school	6	2	6	4
Type of organization:				
Sole proprietorship	82	79	81	80
Partnership	14	13	12	13
Corporation	3	8	6	6
Major occupation:				
Farming	80	82	76	80
Retired and other	14	17	21	17
Income solvency group:				
Favorable	75	65	56	65
Marginal solvency	10	14	18	14
Marginal income	10	16	16	15
Vulnerable	5	5	9	6

¹Data may not add due to rounding or omission of possible categories.

Appendix

Appendix table 16—Input use by ARMS cotton farms, by ownership cost group, 1997¹

Item	Unit	Low-cost	Mid-cost	High-cost	All ARMS farms
Planting month:					
March	percent of farms	2	3	6	4
April	percent of farms	23	25	22	24
May	percent of farms	71	69	64	68
June	percent of farms	3	3	9	5
Planting:					
Conventional	percent of farms	90	87	97	90
No-till	percent of farms	8	6	7	7
Solid row	percent of farms	81	90	91	88
Skip row	percent of farms	19	10	9	12
Skip patterns					
Plant 2 / skip 1	percent of farms	73	71	85	74
Plant 2 / skip 2	percent of farms	7	6	0	5
Plant 4 / skip 2	percent of farms	3	1	15	4
Plant 8 / skip 1	percent of farms	12	16	0	12
Seed:					
Rate-one time	pounds per acre	13.38	13.39	14.81	13.68
Percent homegrown seed	percent	19	18	24	20
Percent purchased seed	percent	81	82	76	80
Percent herbicide resistant	percent	6	7	8	7
Percent Bt	percent	11	18	16	16
Fuel use:					
Diesel	gallons per acre	17	20	24	20
Electric	Kilowatt hours per acre	27	36	198	68
Gas	gallons per acre	4	5	6	5
LP Gas	gallons per acre	0.1	0.1	7	2
Custom operations:					
Chemical application	percent of farms	36	44	47	43
Cultivation	percent of farms	7	13	8	10
Fertilizer application	percent of farms	28	43	39	39
Harvesting	percent of farms	28	30	26	29
Land preparation	percent of farms	5	10	4	7
Scouting	percent of farms	41	46	34	42
Seeding	percent of farms	7	12	8	10
Soil testing	percent of farms	16	20	15	18
Harvesting month:					
August	percent of farms	2	1	3	2
September	percent of farms	3	5	2	4
October	percent of farms	47	41	36	41
November	percent of farms	32	38	41	37
December	percent of farms	2	4	3	3
Harvesting machinery:					
Picker	percent of farms	49	51	46	50
Stripper	percent of farms	27	25	44	30
Module builder	percent of farms	24	31	28	28

¹Data may not add due to rounding or omission of possible categories.

Appendix

Appendix table 17—Chemical use and testing by ARMS cotton farms, by ownership cost group, 1997¹

Item	Unit	Low-cost	Mid-cost	High-cost	All ARMS farms
Chemical use:					
Insecticides	percent of farms	74	83	80	80
Herbicides	percent of farms	98	97	96	97
Fungicides	percent of farms	9	6	6	6
Nematicides	percent of farms	71	79	65	73
Chemical use:					
Insecticides	times-over	2.13	2.59	2.68	2.49
Herbicides	times-over	3.32	3.74	2.74	3.42
Fungicides	times-over	0.16	0.11	0.14	0.13
Nematicides	times-over	1.70	2.09	1.85	1.94
Reasons for herbicide applications:					
Pre-emergent					
Routine practice	percent of farms	90	81	91	86
Field map	percent of farms	9	6	5	6
Recommendations by:					
Chemical dealer	percent of farms	14	20	11	16
Crop consultant	percent of farms	10	7	5	8
Post-emergent					
Routine treatment	percent of farms	42	41	32	39
Weed type/density	percent of farms	45	39	41	41
Recommendations by:					
Chemical dealer	percent of farms	14	10	11	11
Crop consultant	percent of farms	10	7	6	7
Reasons for insecticide applications:					
Preventive schedule	percent of farms	30	30	30	30
Boll weevil trapping targets	percent of farms	15	13	20	15
Scouting data	percent of farms	37	35	33	35
Standard practices/history	percent of farms	23	29	22	26
Local information of presence	percent of farms	11	4	6	6
Operators determination	percent of farms	41	36	40	38
Testing:					
Soil test	percent of farms	40	46	38	42
Plant tissue test	percent of farms	8	7	9	8
Nitrogen test	percent of farms	18	26	22	23
Nitrogen applications:					
Less than recommended	percent of farms	26	22	29	25
More than recommended	percent of farms	4	16	9	12
Equal to recommendations	percent of farms	70	62	62	63

¹Data may not add due to rounding or omission of possible categories.