Appendix A

Description of Surveys

Agricultural Resource Management Study (ARMS)

The ARMS, developed from combining the former Cropping Practices Survey and the Farm Costs and Returns Survey, was first conducted in 1996. A multiframe, stratified sampling procedure is used to select farms and crop fields to collect detailed information on production inputs, practices, costs, and returns. The inputs include detailed measurements of fertilizer and pesticide use and the time and methods of their application. The survey also obtains information on other nutrient and pest management practices applied by the producer. The results are weighted and aggregated to develop State, regional, and national estimates. Table A.1 reports the 1996 and 1997 sample size, by crop, for this survey.

Cropping Practices Surveys, 1990-95

The Cropping Practices Surveys were commodity surveys that collected data on fertilizer and pesticide use, tillage operations, crop sequence, and other inputs and cultural practices. The 1995 survey gathered data for corn, cotton, soybeans, wheat, and potatoes and represented about 182 million acres. The represented area included the acreage in major producing States for each commodity and accounted for 70-90 percent of the total U.S. acreage for each of these crops. See the following table for the States included in the survey and the number of fields sampled to develop estimates.

The Cropping Practices Surveys used a stratified sampling procedure to gather data about a randomly selected acre of the crop. Because the random acre within a field was not identified, respondents (farm operators) were asked to provide field-level information on all fertilizer and nutrient treatments, all tillage operations prior to planting, crops planted in the previous 2 years, and data on other inputs and cultural practices. The operator also identified whether the field had been designated as highly erodible land (HEL) by the Natural Resources Conservation Service and whether the farm unit participated in a Federal commodity price or income support program.

The Cropping Practices Surveys were annual surveys, although the commodities and States surveyed changed from year to year because of priority data needs and regional shifts in crop production. Consistent data for selected States were collected between 1990 and 1995 and were used to develop the time series data in this report. The sample number and statistical reliability of estimates for preceding years is generally similar to that for 1995.

Chemical Use Surveys

The Chemical Use Surveys collect nutrient and pesticide use and other production data on fruit and vegetable crops. Since 1990, data on vegetable crops were collected for even numbered years (1990, 1992, and 1994), while data for fruit crops were collected in odd numbered years (1991, 1993, and 1995). Besides gathering chemical use data, these surveys also focused on data related to integrated pest management, the use of organic production practices, and farm enterprise and operator characteristics. Specific field-level information on nutrient and pest management was collected for apples, oranges, grapes, peaches, fresh market tomatoes, and strawberries. The surveys were a stratified systematic sample of growers who produce at least an acre of the targeted crop.

Table A.1—Completed sample sizes for the 1996 and 1997 Agricultural Resource Management Study

State	Corn	Soybeans	Upland cotton	Winter wheat	Durum wheat	Spring wheat	Fall potatoes	Total
				1996 sample number				
AZ	.	.	76	.	.	.	.	76
AR	.	171	95	.	.	.	.	266
CA	.	.	137	.	.	.	.	137
CO	.	.	.	72	.	.	.	72
DE	.	.	.	76	.	.	.	76
GA	.	.	106	.	.	.	.	106
ID	.	.	.	66	.	.	226	292
IL	271	247	.	.	.	.	.	518
IN	236	182	.	.	.	.	.	418
IA	1,009	948	.	.	.	.	.	1,957
KS	217	.	.	174	.	.	.	391
KY	73	.	.	.	.	.	.	73
LA	.	122	78	.	.	.	.	200
ME	.	.	.	.	.	.	118	118
MI	152	.	.	.	.	.	.	152
MN	222	242	.	.	.	64	.	528
MS	.	147	158	.	.	.	.	305
MO	156	171	.	.	.	.	.	327
MT	.	.	.	49	.	85	.	134
NE	275	152	.	40	.	.	.	467
NC	73	.	.	.	.	.	.	73
ND	.	.	.	.	99	99	.	198
OH	173	163	.	.	.	.	.	336
OK	.	.	.	83	.	.	.	83
OR	.	.	.	76	.	.	.	76
PA	93	.	.	.	.	.	.	93
SC	55	.	.	.	.	.	.	55
SD	178	.	.	56	.	.	.	234
TN	.	150	111	.	.	.	.	261
TX	58	.	388	103	.	.	.	549
WA	.	.	.	108	.	.	61	169
WI	700	154	.	.	.	.	.	854
MN/ND 1/	.	.	.	.	.	.	69	69
Total	3,941	2,849	1,149	903	99	248	474	9,663

See notes at end of table.

—Continued

Table A.1—Completed sample sizes for the 1996 and 1997 Agricultural Resource Management Study—continued

State	Corn	Soybeans	Upland cotton	Winter wheat	Spring wheat	Durum wheat	Fall potatoes	Total
				1997 sample number				
AL	.	.	75	.	.	.	.	75
AZ	.	.	55	.	.	.	.	55
AR	.	83	49	.	.	.	.	132
CA	.	.	54	.	.	.	.	54
CO	.	.	.	81	.	.	.	81
DE	.	159	.	.	.	.	.	159
GA	.	.	95	.	.	.	.	95
ID	.	.	.	83	.	.	185	268
IL	226	217	.	65	.	.	.	508
IN	150	154	.	.	.	.	.	304
IA	205	209	.	.	.	.	.	414
KS	.	136	.	229	.	.	.	365
KY	.	108	.	.	.	.	.	108
LA	.	126	84	.	.	.	.	210
ME	.	.	.	.	.	.	122	122
MI	146	61	.	.	.	.	.	207
MN	144	174	.	.	48	.	49	415
MS	.	167	126	.	.	.	.	293
MO	144	138	53	67	.	.	.	402
MT	.	.	.	75	90	.	.	165
NE	192	177	.	81	.	.	.	450
NC	.	75	74	.	.	.	.	149
ND	.	.	.	.	92	119	47	258
OH	157	134	.	67	.	.	.	358
OK	.	.	.	149	.	.	.	149
OR	.	.	.	82	.	.	91	173
PA	.	162	.	158	.	.	.	320
SC	.	.	56	.	.	.	.	56
SD	171	116	.	62	69	.	.	418
TN	.	102	102	.	.	.	.	204
TX	.	.	308	135	.	.	.	443
WA	.	.	.	101	.	.	71	172
WI	159	56	.	.	.	.	71	286
Total	1,694	2,554	1,131	1,435	299	119	636	7,868

. = No survey conducted in State.
1/ Includes only counties along the Red River Valley in Minnesota and North Dakota.
Source: USDA, National Agricultural Statistics Service and Economic Research Service, 1996c.

Table A.2—Completed sample sizes for the 1995 Cropping Practices Survey

State	Soybeans	Upland cotton	Corn	Fall potatoes	Winter wheat	Spring wheat	Durum wheat
				Number of fields			
AZ	.	69	.	.	.	.	.
AR 1/	125	117	.	.	.	.	.
CA	.	160	.	.	.	.	.
CO	.	.	.	72	82	.	.
DE	.	.	76	.	.	.	.
GA	122	.	115	.	.	.	.
ID	.	.	.	262	85	.	.
IL 1/	206	.	265	.	76	.	.
IN 1/	138	.	164	.	.	.	.
IA 1/	209	.	624	.	.	.	.
KS	.	.	69	.	391	.	.
KY	158	.	153	.	.	.	.
LA	160	93	.	.	.	.	.
ME	.	.	.	146	.	.	.
MI 1/	.	.	84	83	.	.	.
MN 1/	98	.	171	94	.	61	.
MS	179	149	.	.	.	.	.
MO 1/	122	.	119	.	64	.	.
MT	.	.	.	.	94	82	.
NE 1/	83	.	199	.	93	.	.
NY	.	.	.	57	.	.	.
NC	153	.	132	.	.	.	.
ND	.	.	.	133	.	102	116
OH 1/	126	.	133	.	72	.	.
OK	.	.	.	.	478	.	.
OR	.	.	.	143	93	.	.
PA	.	.	82	56	.	.	.
SD 1/	.	.	104	.	56	58	.
TN	157	.	.	.	.	.	.
TX	.	439	69	.	153	.	.
WA	.	.	.	144	135	.	.
WI 1/	.	.	136	130	.	.	.
Total	2,036	1,027	2,695	1,320	1,872	303	116

. = No survey conducted in the State.

1/ For corn and soybeans, no pest management information was collected in this State. However pest management data were collected in 1994 on a similar size of sample and used to calculate estimates for this report.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 1995c.

Table A.3—Completed sample sizes for the 1995 Fruit Chemical Use Survey

Item	Total	CA	FL	GA	MI	NJ	NY	OR	PA	SC	WA
						Number of growers					
Apples	1,120	91	.	34	175	68	182	141	139	39	251
Apricots	78	78	.	.	.	.	.	.	.	.	.
Avocados	101	51	50	.	.	.	.	.	.	.	.
Blackberries	110	.	.	.	.	.	.	110	.	.	.
Blueberries	322	.	.	55	131	64	.	72	.	.	.
Dates	33	33	.	.	.	.	.	.	.	.	.
Figs	14	14	.	.	.	.	.	.	.	.	.
Grapes	704	255	.	.	99	.	81	104	83	.	82
Kiwifruit	48	48	.	.	.	.	.	.	.	.	.
Nectarines	98	98	.	.	.	.	.	.	.	.	.
Olives	65	65	.	.	.	.	.	.	.	.	.
Peaches	684	169	.	41	93	77	55	.	107	75	67
Pears	390	78	.	.	.	.	74	111	.	.	127
Plums	116	116	.	.	.	.	.	.	.	.	.
Prunes	150	150	.	.	.	.	.	.	.	.	.
Grapefruit	258	75	183	.	.	.	.	.	.	.	.
Lemons	87	87	.	.	.	.	.	.	.	.	.
Limes	16	.	16	.	.	.	.	.	.	.	.
Oranges	454	183	271	.	.	.	.	.	.	.	.
Tangelos	126	.	126	.	.	.	.	.	.	.	.
Tangerines	193	59	134	.	.	.	.	.	.	.	.
Raspberries	162	.	.	.	.	.	.	81	.	.	81
Cherries, sweet	449	98	.	.	100	.	.	112	.	.	139
Cherries, tart	298	.	.	.	139	.	51	45	63	.	.
Temples	97	.	97	.	.	.	.	.	.	.	.
Total	6,551	1,924	892	178	746	228	450	843	396	118	776

. = No survey conducted in the State.
Source: USDA, National Agricultural Statistics Service and Economic Research Service, 1995d.

Table A.4—Completed sample sizes for the 1994 Vegetable Chemical Use Survey

Item	ALL	AZ	CA	FL	GA	IL	MI	MN	NJ	NY	NC	OR	TX	WA	WI
								Number of growers							
Watermelons	798	35	76	101	222	.	.	.	.	.	142	.	222	.	.
Other melons	457	21	93	.	94	.	88	.	.	.	.	.	161	.	.
Strawberries	623	.	90	49	.	.	87	.	59	72	65	91	.	32	78
Asparagus	398	.	27	.	.	80	119	.	61	.	.	18	.	93	.
Broccoli	230	15	130	.	.	.	.	.	.	.	.	48	37	.	.
Carrots	337	7	95	7	.	.	52	.	.	30	.	43	45	26	32
Cauliflower	221	8	65	.	.	.	38	.	.	47	.	50	13	.	.
Celery	72	.	36	5	.	.	28	.	.	.	.	.	3	.	.
Eggplant	197	.	.	35	.	.	.	.	162	.	.	.	.	.	.
Lettuce, head	164	19	65	3	.	.	.	.	51	26	.	.	.	.	.
Onions	787	19	136	.	112	.	64	.	.	107	.	129	134	54	32
Peppers, bell	647	.	100	53	.	.	106	.	241	.	78	.	69	.	.
Lettuce, other	141	13	122	6	.	.	.	.	.	.	.	.	.	.	.
Cabbage, fresh	718	.	55	25	64	.	72	.	113	124	129	.	79	.	57
Sweet corn, fresh	1,447	.	93	87	126	106	152	.	228	182	170	84	64	63	92
Cucumbers, fresh	663	.	79	40	57	.	77	.	160	69	96	.	85	.	.
Beans, lima, fresh	78	.	.	.	78	.	.	.	.	.	.	.	.	.	.
Beans, snap, fresh	619	.	82	77	109	.	65	.	108	69	109	.	.	.	.
Spinach, fresh	158	.	53	.	.	.	.	.	66	.	.	.	39	.	.
Tomatoes, fresh	974	.	168	53	42	.	118	.	270	127	93	.	103	.	.
Cabbage, processed	57	.	.	.	.	.	6	.	.	30	.	.	.	.	21
Sweet corn, processed	792	.	.	.	.	140	12	99	.	73	.	150	.	87	231
Cucumbers, processed	319	.	13	4	5	.	104	.	.	.	105	17	33	15	23
Beans, lima, processed	165	.	31	.	.	37	.	.	32	.	.	4	.	43	18
Peas, processed	564	.	.	.	.	102	.	94	.	56	.	55	.	87	170
Beans, snap, processed	471	.	6	.	.	68	71	.	22	34	8	125	.	4	133
Spinach, processed	21	.	10	.	.	.	.	.	.	.	.	.	11	.	.
Tomatoes, processed	166	.	139	.	.	.	27	.	.	.	.	.	.	.	.
Total	12,284	137	1,764	545	909	533	1,286	193	1,573	1,046	995	814	1,098	504	887

.= No survey conducted in State.
Source: USDA, National Agricultural Statistics Service and Economic Research Service, 1994.