



United States
Department of
Agriculture

National
Agricultural
Statistics
Service



Pest Management Practices 1997 Summary

August 1998

Sp Cr 1(98)

USDA



1997 Pest Management Practices

Overview: The pest management practices in this report are based on data compiled from a survey conducted in the Fall of 1997. All results refer to responses from sampled producers concerning specific practices. The producers were asked how many acres of a specific commodity they had, and what pesticide management practices they used. The producers were asked a series of questions to which they responded yes or no. Pests were defined as weeds, insects, and diseases. If the respondent used a specific practice on a crop, it was assumed that the practice was used on all of the acres of that crop. For example, if a producer had 500 acres of wheat, and used field mapping of previous weed problems to assist in making weed management decisions, it was assumed that all 500 acres were mapped.

For this report, each question has been categorized into one of four pest management categories: prevention, avoidance, monitoring, and suppression. See pages 30-31 for a copy of the actual questions used to collect these data. Not all possible questions regarding management practices in each category were asked.

The data is published in two tables for each crop: percent of acres receiving the specific pest management practice and percent of farms utilizing the specific pest management practice. These percentages are published at the U.S. and regional level. For a specific crop, the percentages refer only to the farms and acres on which that crop is grown. If the percentage is less than one percent or there were too few reports to publish the percentage, an asterisk or double asterisk was used in the table. A blank indicates there were no reports of the practice being used.

Prevention is the practice of keeping a pest population from infesting a crop or field. It includes such tactics as using pest-free seeds and transplants, preventing weeds from reproducing, choosing cultivars with genetic resistance to insects or disease, irrigation scheduling to avoid situations conducive to disease development, cleaning tillage and harvesting equipment between fields or operations, using field sanitation procedures, and eliminating alternate hosts or sites for insect pests and disease organisms.

The following questions were categorized as prevention practices:

Did you use practices such as tilling, mowing, burning, or chopping of field lanes or roadways to manage pests?

Did you remove or plow down crop residues to control pests?

Did you clean tillage or harvesting implements after completing fieldwork for the purpose of reducing the spread of weeds, diseases, or other pests?

Did you use water management practices, such as controlled drainage or irrigation scheduling, excluding chemigation, to control pests?

Avoidance may be practiced when pest populations exist in a field or site but the impact of the pest on the crop can be avoided through some cultural practice. Examples of avoidance tactics include crop rotation such that the crop of choice is not a host for the pest, choosing cultivars with genetic resistance to pests, using trap crops, choosing cultivars with maturity dates that may allow harvest before pest populations develop, fertilization programs to promote rapid crop development, and simply not planting certain areas of fields where pest populations are likely to cause crop failure. Some tactics for prevention and avoidance strategies may overlap.

The following questions were categorized as avoidance practices:

Did you use any seed varieties with Bt (*Bacillus Thuringiensis*) genes for insect resistance?

Did you adjust planting or harvesting dates to control pests?

Do you rotate crops for the purpose of controlling pests?

Monitoring includes proper identification of pests through surveys or scouting programs, including trapping, weather monitoring, and soil testing where appropriate.

The following questions were categorized as monitoring practices:

Were any of the crops on this operation scouted for pests (weeds, insects, or disease) using a systematic method?

Were electronic or written records kept to track the activity or numbers of different pests?

Did you use field mapping of previous weed problems to assist you in making weed management decisions?

Did you use soil analysis to detect the presence of pests, such as insects, disease, or nematodes?

Did you use pheromones to monitor the presence of pests?

Suppression tactics include cultural practices such as narrow row spacings or optimized in-row plant populations, alternative tillage approaches such as no-till or strip-till systems, cover crops or mulches, or using crops with allelopathic potential in the rotation. Physical suppression tactics may include cultivation or mowing for weed control, baited or pheromone traps for certain insects, and temperature management or exclusion devices for insect and disease management. Biological controls, including mating disruption for insects, should be considered as alternatives to conventional pesticides, especially where long-term control of an especially troublesome pest species can be obtained. Chemical pesticides are important and some use will remain necessary. However, pesticides should be applied as a last resort in suppression systems.

The following questions were categorized as suppression practices:

Did you use any seed varieties that were genetically engineered to be pesticide resistant?

Did you use any additional seed treatments that would protect the crop from diseases, weeds, or other pests?

Did you use scouting data and compare it to university or extension guidelines for infestation thresholds to determine when to take measures to control pests?

Did you use biological pesticides such as Bt (*Bacillus Thuringiensis*), mating disrupters, or insect regulators to control pests?

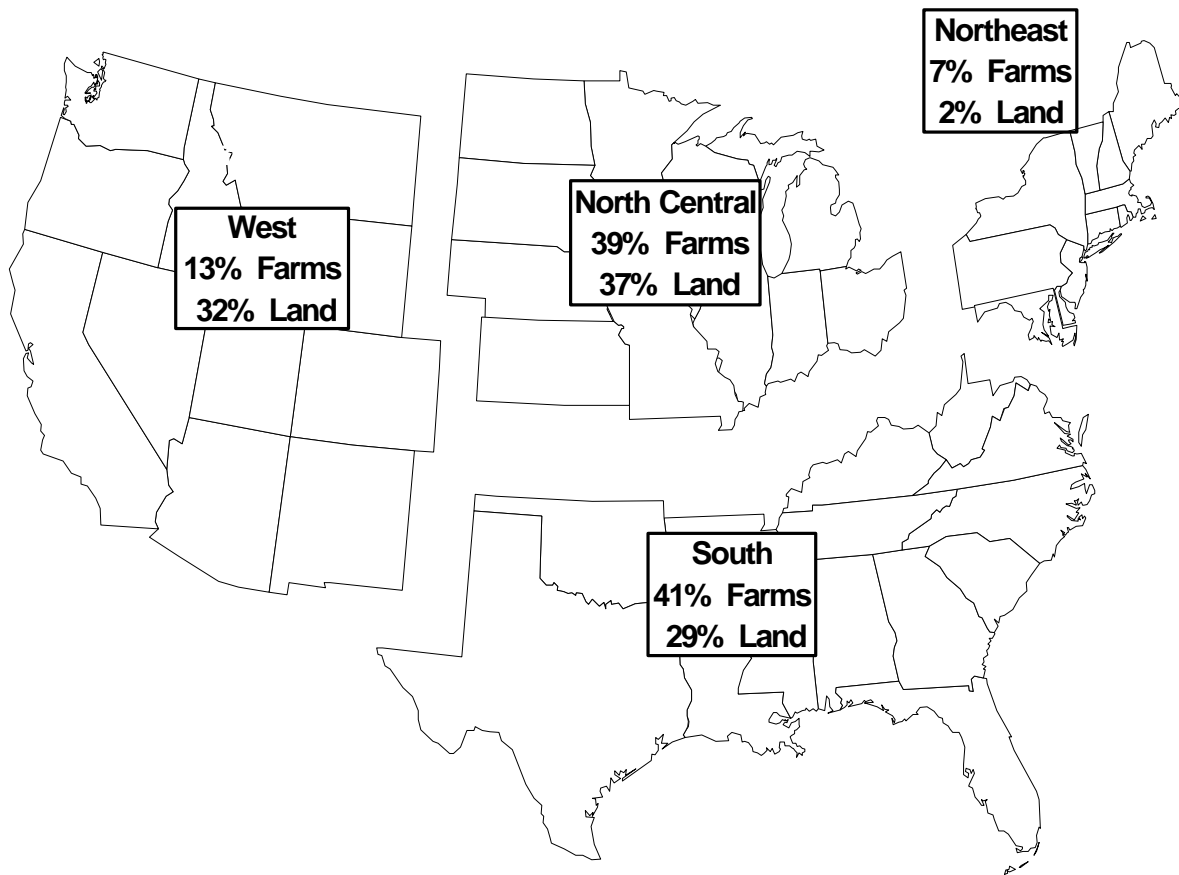
Did you use beneficial organisms (insects, nematodes, or fungi) to control pests?

Did you maintain ground covers, mulches, or physical barriers to reduce pest problems?

Did you adjust row spacing, plant density, or row direction to control pests?

Do you alternate pesticides to keep pests from becoming resistant to pesticides?

Distribution of Farms and Land in Farms by Region, 1997



Regions:

Northeast	CT, DE, ME, MD, MA, NH, NJ, NY, PA, RI, VT
North Central	IL, IN, IA, KS, MI, MN, MO, NE, ND, OH, SD, WI
South	AL, AR, FL, GA, KY, LA, MS, NC, OK, SC, TN, TX, VA, WV
West	AZ, CA, CO, ID, MT, NV, NM, OR, UT, WA, WY

Alaska and Hawaii were not included in the survey.

Highlights

Barley: The leading pest management practice for barley was rotating crops to control pests, with 59 percent of the acres and 58 percent of the farms using this practice across the United States. Alternating pesticides was reported on 41 percent of the acres, and 29 percent of the farms in the U.S. Using tillage practices to manage pests, cleaning implements after fieldwork, scouting for pests, and additional seed treatments were each reported on over 30 percent of the acres.

Corn: Rotating crops to control pests was the leading pest management practice used on corn acres across the U.S., at 69 percent. It was also the most widely used practice in terms of number of farms, at 57 percent. Scouting for pests was reported on 47 percent of the acres, and 31 percent of the farms in the U.S. Alternating pesticides and using tillage practices to manage pests were the next most common practices in terms of acres, at 43 and 40 percent, respectively.

Cotton: Almost 75 percent of the U.S. cotton acres were scouted for pests, and 67 percent of the cotton farms reported using the pest management practice. Removing or plowing down the crop residue was the second most widely used practice, being used on 63 percent of the acres and 58 percent of the farms. Using tillage to control pests was used on 62 percent of the acres and 56 percent of the farms. Other practices which were reported on 50 percent or more of the acres are alternating pesticides and using records to keep track of pests.

Soybeans: The most common pest management practice was rotating crops to control pests, which was done on over two-thirds of the U.S. soybean acres and 64 percent of the soybean farms. Other practices used on 40 percent or more of the acres were: using tillage to manage pests, scouting for pests, and alternating pesticides.

All Wheat: The leading pest management practice used on wheat was rotating crops to control pests, which was used on 53 percent of the acres and 51 percent of the farms. Cleaning implements after fieldwork was the second most widely used practice, with 43 percent of the acres and 32 percent of the farms. Using tillage to manage pests, scouting for pests, and alternating pesticides were each reported on 30 percent or more of the acres.

Alfalfa Hay: Rotating crops to control pests was the most widely used pest management practice on the U.S. alfalfa acreage, at 32 percent. Scouting for pests and using tillage to control pests were used on 24 and 21 percent of the acres, respectively.

Other Hay: Nearly one-third of the U.S. other hay producers rotated crops to control pests. Twenty percent or more of the hay producers used the following practices on their farms: using tillage practices to manage their pests, scouting for pests, and cleaning implements after fieldwork.

Highlights (continued)

Fruits and Nuts: The most widely used pest management practice was scouting for pests, which occurred on 80 percent of the U.S. fruit and nut acres. Using tillage to manage pests was the second most common practice, used on 74 percent of the acres. Keeping records to track pest problems and alternating pesticides were used on 60 and 68 percent, respectively.

Vegetables: Eighty-one percent of the U.S. vegetable acres were scouted for pests, making it the most common pest management practice. Rotating crops was reported on 74 percent of the acres, while alternating pesticides was used on 68 percent of the acres.

All other Crops and Cropland Pasture: The most widely used pest management practice was rotating crops to control pests, at 49 percent. Scouting for pests, using tillage to manage pests, cleaning implements after fieldwork, and alternating pesticides were all used on more than 30 percent of the acres.

Planted and Harvested Acres for Selected Crops,
by State and Region, 1997 Crop Year

State and Region	Area Planted				Area Harvested		
	Barley 1/	Corn	Cotton	Soybeans	All Wheat 1/	Alfalfa Hay	Other Hay
	1,000 Acres						
CT		38				12	60
DE	40	150		225	75	7	8
ME		35				7	155
MD	55	500		540	220	40	150
MA		28				16	85
NH		17				8	45
NJ	5	118		135	35	25	95
NY		1,200			140	640	860
PA	80	1,550		370	180	740	1,130
RI		2				3	4
VT		95				50	220
Northeast:	180	3,733		1,270	650	1,548	2,812
IL		11,200		10,000	1,200	630	390
IN		6,000		5,450	700	400	325
IA		12,200		10,500	30	1,200	450
KS	10	2,850	12	2,450	11,400	900	1,800
MI	26	2,600		1,900	550	900	350
MN	580	7,000		6,800	2,520	1,475	900
MO		2,950	380	4,900	1,100	480	3,000
NE	10	9,000		3,500	2,000	1,300	1,900
ND	2,400	800		1,200	11,570	1,750	1,400
OH		3,600		4,500	1,200	600	650
SD	145	3,800		3,500	4,170	2,300	2,000
WI	80	3,800		1,000	153	1,900	400
North Central:	3,251	65,800	392	55,700	36,593	13,835	13,565

See footnotes at end of table.

--continued

Planted and Harvested Acres for Selected Crops,
by State and Region, 1997 Crop Year (continued)

State and Region	Area Planted					Area Harvested	
	Barley 1/	Corn	Cotton	Soybeans	All Wheat 1/	Alfalfa Hay	Other Hay
	1,000 Acres						
AL 2/		290	535	400	140		750
AR		180	950	3,600	880	25	1,150
FL 2/		120	100	40	17		230
GA 2/		550	1,440	430	400		600
KY	16	1,300		1,300	700	300	2,000
LA 2/		500	630	1,400	130		320
MS 2/		490	985	2,100	200		720
NC	24	950	670	1,400	730	15	515
OK	10	210	200	340	6,800	390	2,100
SC 2/	4	350	290	620	310		300
TN		730	490	1,320	560	40	1,700
TX	10	2,000	5,532	420	6,300	100	4,300
VA	80	500	101	510	280	130	1,110
WV		65			13	40	520
South:	144	8,235	11,923	13,880	17,460	1,040	16,315
AZ	70	70	347		100	180	40
CA	230	580	1,065		655	980	520
CO	95	1,150			3,153	820	610
ID	780	110			1,510	1,020	300
MT	1,300	60			6,240	1,650	950
NV	5				18	240	250
NM		135	81		430	265	90
OR	130	47			1,005	430	615
UT	100	67			200	545	155
WA	500	150			2,700	480	300
WY	125	90			275	640	620
West:	3,335	2,459	1,493		16,286	7,250	4,450
US	6,910	80,227	13,808	70,850	70,989	23,673	37,142

1/ Includes area planted in preceding fall.

2/ Alfalfa and alfalfa mixtures are included in all other hay.

Pest Management Practices,
Percent of Acres Receiving Practice,
Barley, 1997

Practice	Region				

	North- East	North Central	South	West	United States

	-- Percent of Acres --				
Prevention Practices:					
Tillage/etc. to manage pests	77	30	41	35	34
Remove or plow down crop residue	53	19	32	27	24
Clean implements after fieldwork	60	32	65	41	38
Water management practices	5	5	*	7	6
Avoidance Practices:					
Seed varieties with BT genes				*	*
Adjust planting/harvesting dates	11	13	*	13	13
Rotate crops to control pests	92	57	84	58	59
Monitoring Practices:					
Scouted for pests	52	28	59	41	35
Records kept to track pests	12	10	*	13	11
Field mapping of weed problems	6	19	*	25	21
Soil analysis to detect pests	9	*	25	5	4
Pheromones to monitor pests		*		1	1
Suppression Practices:					
Seed varieties pesticide resistant				1	1
Additional seed treatments	16	21	*	44	31
Scouting used to make decisions	28	11	27	14	13
Biological pesticides					
Beneficial organisms		*		1	1
Physical barriers	9	15	35	12	14
Adjust planting methods	13	*	*	5	3
Alternate pesticides	41	42	35	39	41

* Insufficient reports to publish data.

Pest Management Practices,
Percent of Farms Utilizing Practice,
Barley, 1997

Practice	Region				
	North- East	North Central	South	West	United States
-- Percent of Farms --					
Prevention Practices:					
Tillage/etc. to manage pests	69	23	20	36	33
Remove or plow down crop residue	42	18	12	27	24
Clean implements after fieldwork	31	26	21	34	29
Water management practices	3	3	*	9	6
Avoidance Practices:					
Seed varieties with BT genes				*	*
Adjust planting/harvesting dates	7	7	*	11	9
Rotate crops to control pests	64	58	78	52	58
Monitoring Practices:					
Scouted for pests	23	20	22	33	25
Records kept to track pests	13	5	*	8	7
Field mapping of weed problems	8	14	*	17	13
Soil analysis to detect pests	8	*	8	5	4
Pheromones to monitor pests		*		1	1
Suppression Practices:					
Seed varieties pesticide resistant				2	1
Additional seed treatments	9	18	*	41	25
Scouting used to make decisions	16	8	7	9	9
Biological pesticides					
Beneficial organisms		*		1	1
Physical barriers	6	11	16	9	10
Adjust planting methods	11	*	*	7	5
Alternate pesticides	24	30	16	31	29

* Insufficient reports to publish data.

Pest Management Practices,
Percent of Acres Receiving Practice,
Corn, 1997

Practice	Region				
	North- East	North Central	South	West	United States
	-- Percent of Acres --				
Prevention Practices:					
Tillage/etc. to manage pests	38	39	40	49	40
Remove or plow down crop residue	34	17	38	40	20
Clean implements after fieldwork	33	33	36	44	34
Water management practices	10	10	12	27	10
Avoidance Practices:					
Seed varieties with BT genes	4	5	5	2	5
Adjust planting/harvesting dates	11	8	10	15	8
Rotate crops to control pests	61	71	59	49	69
Monitoring Practices:					
Scouted for pests	33	49	27	55	47
Records kept to track pests	17	20	9	25	19
Field mapping of weed problems	14	16	4	19	15
Soil analysis to detect pests	11	10	10	19	11
Pheromones to monitor pests	2	1	1	*	1
Suppression Practices:					
Seed varieties pesticide resistant	4	2	4	5	2
Additional seed treatments	32	8	10	24	10
Scouting used to make decisions	18	19	8	24	18
Biological pesticides	6	4	2	*	4
Beneficial organisms	1	**	1	*	**
Physical barriers	18	10	10	17	11
Adjust planting methods	10	6	13	11	7
Alternate pesticides	34	44	35	45	43

* Insufficient reports to publish data.

** Less than 1 percent.

Pest Management Practices,
Percent of Farms Utilizing Practice,
Corn, 1997

Practice	Region				
	North- East	North Central	South	West	United States
	-- Percent of Farms --				
Prevention Practices:					
Tillage/etc. to manage pests	33	30	31	44	31
Remove or plow down crop residue	28	16	31	36	20
Clean implements after fieldwork	23	24	25	37	24
Water management practices	5	6	7	21	7
Avoidance Practices:					
Seed varieties with BT genes	6	13	4	3	11
Adjust planting/harvesting dates	7	5	9	14	6
Rotate crops to control pests	50	61	37	50	57
Monitoring Practices:					
Scouted for pests	17	34	20	45	31
Records kept to track pests	6	10	4	15	9
Field mapping of weed problems	5	8	4	8	7
Soil analysis to detect pests	6	6	6	12	6
Pheromones to monitor pests	**	**	**	*	**
Suppression Practices:					
Seed varieties pesticide resistant	6	4	8	8	4
Additional seed treatments	22	8	7	26	10
Scouting used to make decisions	7	10	4	15	9
Biological pesticides	2	2	**	*	2
Beneficial organisms	**	**	**	*	**
Physical barriers	10	8	5	13	8
Adjust planting methods	5	4	8	7	5
Alternate pesticides	20	33	20	31	30

* Insufficient reports to publish data.

** Less than 1 percent.

Pest Management Practices,
Percent of Acres Receiving Practice,
Cotton, 1997

Practice	Region				
	North- East	North Central	South	West	United States
	-- Percent of Acres --				
Prevention Practices:					
Tillage/etc. to manage pests		77	60	72	62
Remove or plow down crop residue		60	59	91	63
Clean implements after fieldwork		25	53	45	52
Water management practices			13	26	14
Avoidance Practices:					
Seed varieties with BT genes			12	23	13
Adjust planting/harvesting dates			23	34	24
Rotate crops to control pests		*	45	65	48
Monitoring Practices:					
Scouted for pests		53	70	91	73
Records kept to track pests		*	47	75	50
Field mapping of weed problems		*	10	48	14
Soil analysis to detect pests			23	49	26
Pheromones to monitor pests			37	26	36
Suppression Practices:					
Seed varieties pesticide resistant			6	*	5
Additional seed treatments		*	18	41	21
Scouting used to make decisions		*	44	59	45
Biological pesticides			10	27	12
Beneficial organisms			1	8	2
Physical barriers		*	11	2	10
Adjust planting methods		*	9	10	10
Alternate pesticides		*	54	87	58

* Insufficient reports to publish data.

Pest Management Practices,
Percent of Farms Utilizing Practice,
Cotton, 1997

Practice	Region				
	North- East	North Central	South	West	United States
	-- Percent of Farms --				
Prevention Practices:					
Tillage/etc. to manage pests	88	56	46	56	
Remove or plow down crop residue	57	56	89	58	
Clean implements after fieldwork	6	50	57	49	
Water management practices		9	32	11	
Avoidance Practices:					
Seed varieties with BT genes		18	14	17	
Adjust planting/harvesting dates		22	53	24	
Rotate crops to control pests	*	44	58	46	
Monitoring Practices:					
Scouted for pests	36	67	75	67	
Records kept to track pests	*	39	56	40	
Field mapping of weed problems	*	8	26	10	
Soil analysis to detect pests		16	35	18	
Pheromones to monitor pests		34	30	32	
Suppression Practices:					
Seed varieties pesticide resistant		14	*	13	
Additional seed treatments	*	20	56	23	
Scouting used to make decisions	*	37	57	38	
Biological pesticides		10	16	10	
Beneficial organisms		1	2	2	
Physical barriers	*	10	5	10	
Adjust planting methods	*	8	11	8	
Alternate pesticides	*	46	71	47	

* Insufficient reports to publish data.

Pest Management Practices,
Percent of Acres Receiving Practice,
Soybeans, 1997

Practice	Region				
	North- East	North Central	South	West	United States
	-- Percent of Acres --				
Prevention Practices:					
Tillage/etc. to manage pests	48	41	42		41
Remove or plow down crop residue	29	14	33		18
Clean implements after fieldwork	37	34	39		35
Water management practices	24	8	7		8
Avoidance Practices:					
Seed varieties with BT genes		**	**		**
Adjust planting/harvesting dates	11	6	9		7
Rotate crops to control pests	75	75	45		69
Monitoring Practices:					
Scouted for pests	36	49	29		45
Records kept to track pests	18	17	7		15
Field mapping of weed problems	13	17	5		14
Soil analysis to detect pests	32	11	11		11
Pheromones to monitor pests	*	1	*		1
Suppression Practices:					
Seed varieties pesticide resistant	17	9	12		10
Additional seed treatments	10	3	11		5
Scouting used to make decisions	21	17	11		16
Biological pesticides	*	**	1		**
Beneficial organisms		*	**		**
Physical barriers	19	9	7		9
Adjust planting methods	14	12	15		13
Alternate pesticides	57	42	31		40

* Insufficient reports to publish data.

** Less than 1 percent.

Pest Management Practices,
Percent of Farms Utilizing Practice,
Soybeans, 1997

Practice	Region				
	North- East	North Central	South	West	United States
	-- Percent of Farms --				
Prevention Practices:					
Tillage/etc. to manage pests	47	34	36		35
Remove or plow down crop residue	33	12	31		15
Clean implements after fieldwork	27	27	35		28
Water management practices	14	6	5		6
Avoidance Practices:					
Seed varieties with BT genes		**	**		**
Adjust planting/harvesting dates	9	4	6		4
Rotate crops to control pests	74	67	46		64
Monitoring Practices:					
Scouted for pests	25	40	29		38
Records kept to track pests	11	11	5		10
Field mapping of weed problems	10	10	2		9
Soil analysis to detect pests	15	7	7		7
Pheromones to monitor pests	*	**	*		**
Suppression Practices:					
Seed varieties pesticide resistant	20	17	16		17
Additional seed treatments	16	3	10		5
Scouting used to make decisions	20	10	6		10
Biological pesticides	*	**	**		**
Beneficial organisms		*	**		**
Physical barriers	8	7	6		7
Adjust planting methods	10	9	9		9
Alternate pesticides	39	33	26		32

* Insufficient reports to publish data.

** Less than 1 percent.

Pest Management Practices,
Percent of Acres Receiving Practice,
All Wheat, 1997

Practice	Region				
	North- East	North Central	South	West	United States
	-- Percent of Acres --				
Prevention Practices:					
Tillage/etc. to manage pests	55	37	32	42	37
Remove or plow down crop residue	32	23	27	34	27
Clean implements after fieldwork	48	43	36	50	43
Water management practices	26	6	6	7	6
Avoidance Practices:					
Seed varieties with BT genes	*	*	**	*	**
Adjust planting/harvesting dates	25	22	8	26	20
Rotate crops to control pests	79	63	28	57	53
Monitoring Practices:					
Scouted for pests	48	36	21	48	35
Records kept to track pests	22	12	5	16	11
Field mapping of weed problems	16	14	4	20	13
Soil analysis to detect pests	25	5	6	8	6
Pheromones to monitor pests	*	1	*	1	1
Suppression Practices:					
Seed varieties pesticide resistant	7	**	2	3	1
Additional seed treatments	17	16	7	47	21
Scouting used to make decisions	27	14	7	15	13
Biological pesticides	*	**	**	*	**
Beneficial organisms	*	*	**	3	1
Physical barriers	23	11	8	18	12
Adjust planting methods	11	6	5	8	6
Alternate pesticides	43	33	15	40	30

* Insufficient reports to publish data.

** Less than 1 percent.

Pest Management Practices,
Percent of Farms Utilizing Practice,
All Wheat, 1997

Practice	Region				
	North- East	North Central	South	West	United States
	-- Percent of Farms --				
Prevention Practices:					
Tillage/etc. to manage pests	42	31	26	36	31
Remove or plow down crop residue	44	18	26	27	22
Clean implements after fieldwork	34	30	29	44	32
Water management practices	11	5	4	8	5
Avoidance Practices:					
Seed varieties with BT genes	*	*	**	*	**
Adjust planting/harvesting dates	15	17	5	15	14
Rotate crops to control pests	64	61	27	48	51
Monitoring Practices:					
Scouted for pests	26	29	16	37	27
Records kept to track pests	12	7	2	10	7
Field mapping of weed problems	5	8	3	11	7
Soil analysis to detect pests	11	4	4	7	5
Pheromones to monitor pests	*	**	*	1	**
Suppression Practices:					
Seed varieties pesticide resistant	2	**	2	3	1
Additional seed treatments	9	9	4	39	12
Scouting used to make decisions	9	8	4	11	7
Biological pesticides	*	**	**	*	**
Beneficial organisms	*	*	**	2	**
Physical barriers	14	8	6	12	9
Adjust planting methods	4	5	4	6	5
Alternate pesticides	22	21	15	32	21

* Insufficient reports to publish data.

** Less than 1 percent.

Pest Management Practices,
Percent of Acres Receiving Practice,
Alfalfa Hay, 1997

Practice	Region				
	North- East	North Central	South	West	United States
-- Percent of Acres --					
Prevention Practices:					
Tillage/etc. to manage pests	23	15	21	31	21
Remove or plow down crop residue	12	7	11	15	10
Clean implements after fieldwork	29	12	18	25	17
Water management practices	4	3	5	17	8
Avoidance Practices:					
Seed varieties with BT genes	*	*		**	**
Adjust planting/harvesting dates	10	6	5	13	8
Rotate crops to control pests	48	34	17	28	32
Monitoring Practices:					
Scouted for pests	27	20	24	32	24
Records kept to track pests	14	7	*	13	9
Field mapping of weed problems	8	6	4	11	8
Soil analysis to detect pests	8	3	2	6	4
Pheromones to monitor pests	*	*		1	**
Suppression Practices:					
Seed varieties pesticide resistant	1	**	3	3	1
Additional seed treatments	4	**	3	3	1
Scouting used to make decisions	16	7	6	12	9
Biological pesticides	*	*	*	1	1
Beneficial organisms	*	*	*	1	1
Physical barriers	8	4	6	6	5
Adjust planting methods	*	1	2	4	2
Alternate pesticides	8	9	10	20	13

* Insufficient reports to publish data.

** Less than 1 percent.

Pest Management Practices,
Percent of Farms Utilizing Practice,
Alfalfa Hay, 1997

Practice	Region				
	North- East	North Central	South	West	United States
	-- Percent of Farms --				
Prevention Practices:					
Tillage/etc. to manage pests	22	16	13	23	18
Remove or plow down crop residue	6	5	8	9	6
Clean implements after fieldwork	16	10	19	20	13
Water management practices	2	2	4	12	4
Avoidance Practices:					
Seed varieties with BT genes	*	*		1	**
Adjust planting/harvesting dates	4	3	3	7	4
Rotate crops to control pests	39	31	15	18	28
Monitoring Practices:					
Scouted for pests	14	15	17	26	17
Records kept to track pests	5	3	*	4	4
Field mapping of weed problems	3	3	2	4	3
Soil analysis to detect pests	6	3	3	3	3
Pheromones to monitor pests	*	*		**	**
Suppression Practices:					
Seed varieties pesticide resistant	3	1	5	3	2
Additional seed treatments	3	**	4	2	1
Scouting used to make decisions	7	5	5	4	5
Biological pesticides	*	*	*	1	**
Beneficial organisms	*	*	*	1	**
Physical barriers	6	5	6	4	5
Adjust planting methods	*	**	1	2	1
Alternate pesticides	5	7	7	11	7

* Insufficient reports to publish data.

** Less than 1 percent.

Pest Management Practices,
Percent of Acres Receiving Practice,
Other Hay, 1997

Practice	Region				

	North- East	North Central	South	West	United States

	-- Percent of Acres --				
Prevention Practices:					
Tillage/etc. to manage pests	16	8	10	11	10
Remove or plow down crop residue	3	1	4	6	3
Clean implements after fieldwork	8	8	8	13	8
Water management practices	6	**	2	6	2
Avoidance Practices:					
Seed varieties with BT genes		*	*	*	*
Adjust planting/harvesting dates	3	4	1	4	3
Rotate crops to control pests	13	9	2	11	7
Monitoring Practices:					
Scouted for pests	5	6	5	15	7
Records kept to track pests	2	1	1	3	1
Field mapping of weed problems	1	1	1	4	1
Soil analysis to detect pests	1	**	3	**	1
Pheromones to monitor pests	*		*	*	**
Suppression Practices:					
Seed varieties pesticide resistant		*	**	1	**
Additional seed treatments	*	*	1	1	**
Scouting used to make decisions	1	1	1	2	1
Biological pesticides	*	*	*		**
Beneficial organisms	*	*	*	*	**
Physical barriers	3	2	1	2	2
Adjust planting methods	**	**	**	1	**
Alternate pesticides	1	4	2	3	3

* Insufficient reports to publish data.

** Less than 1 percent.

Pest Management Practices,
Percent of Farms Utilizing Practice,
Other Hay, 1997

Practice	Region				
	North- East	North Central	South	West	United States
-- Percent of Farms --					
Prevention Practices:					
Tillage/etc. to manage pests	16	9	8	19	10
Remove or plow down crop residue	4	1	2	7	2
Clean implements after fieldwork	8	5	4	13	6
Water management practices	3	1	1	3	1
Avoidance Practices:					
Seed varieties with BT genes		*	*	*	*
Adjust planting/harvesting dates	2	1	1	3	1
Rotate crops to control pests	15	11	1	10	6
Monitoring Practices:					
Scouted for pests	4	6	3	19	5
Records kept to track pests	1	1	**	2	1
Field mapping of weed problems	1	1	**	3	1
Soil analysis to detect pests	1	**	1	1	1
Pheromones to monitor pests	*		*	*	**
Suppression Practices:					
Seed varieties pesticide resistant		*	**	2	**
Additional seed treatments	*	*	1	2	1
Scouting used to make decisions	1	1	1	2	1
Biological pesticides	*	*	*		**
Beneficial organisms	*	*	*	*	**
Physical barriers	5	1	1	2	1
Adjust planting methods	1	**	**	1	**
Alternate pesticides	2	2	1	3	2

* Insufficient reports to publish data.

** Less than 1 percent.

Pest Management Practices,
Percent of Acres Receiving Practice,
Fruits and Nuts, 1997

Practice	Region				
	North- East	North Central	South	West	United States
	-- Percent of Acres --				
Prevention Practices:					
Tillage/etc. to manage pests	68	35	55	84	74
Remove or plow down crop residue	47	14	11	62	47
Clean implements after fieldwork	62	16	34	46	42
Water management practices	*	10	17	49	39
Avoidance Practices:					
Seed varieties with BT genes				*	*
Adjust planting/harvesting dates	*	*	2	23	17
Rotate crops to control pests	22	6	8	15	13
Monitoring Practices:					
Scouted for pests	87	58	68	85	80
Records kept to track pests	76	25	45	68	60
Field mapping of weed problems	27	*	*	23	17
Soil analysis to detect pests	*	12	39	50	46
Pheromones to monitor pests	62	38	*	45	35
Suppression Practices:					
Seed varieties pesticide resistant	*	*	2	1	1
Additional seed treatments	*		*	**	1
Scouting used to make decisions	84	18	23	47	40
Biological pesticides	*	*	*	19	14
Beneficial organisms	*	*	*	18	14
Physical barriers	30	11	5	44	33
Adjust planting methods	*	5	5	21	16
Alternate pesticides	86	43	65	71	68

* Insufficient reports to publish data.

** Less than 1 percent.

Pest Management Practices,
Percent of Farms Utilizing Practice,
Fruits and Nuts, 1997

Practice	Region				
	North- East	North Central	South	West	United States
	-- Percent of Farms --				
Prevention Practices:					
Tillage/etc. to manage pests	59	34	51	65	58
Remove or plow down crop residue	11	17	6	30	22
Clean implements after fieldwork	11	6	27	26	23
Water management practices	*	16	8	18	15
Avoidance Practices:					
Seed varieties with BT genes				*	*
Adjust planting/harvesting dates	*	*	1	9	6
Rotate crops to control pests	7	19	4	4	6
Monitoring Practices:					
Scouted for pests	33	49	44	70	59
Records kept to track pests	15	8	21	34	27
Field mapping of weed problems	7	*	*	14	9
Soil analysis to detect pests	*	5	18	17	16
Pheromones to monitor pests	6	17	*	20	14
Suppression Practices:					
Seed varieties pesticide resistant	*	*	3	1	2
Additional seed treatments	*		*	1	1
Scouting used to make decisions	29	17	8	28	22
Biological pesticides	*	*	*	10	7
Beneficial organisms	*	*	*	12	8
Physical barriers	28	7	8	20	16
Adjust planting methods	*	2	7	6	7
Alternate pesticides	31	17	38	43	39

* Insufficient reports to publish data.

Pest Management Practices,
Percent of Acres Receiving Practice,
Vegetables, 1997

	:	Region				
	:	-----				
Practice	:	North-	North	:	:	United
	:	East	Central	South	West	States

	:	-- Percent of Acres --				
	:					
Prevention Practices:	:					
	:					
Tillage/etc. to manage pests	:	73	46	67	60	59
Remove or plow down crop residue	:	63	47	59	53	53
Clean implements after fieldwork	:	68	50	47	50	51
Water management practices	:	30	30	29	46	38
	:					
Avoidance Practices:	:					
	:					
Seed varieties with BT genes	:	*		*	*	**
Adjust planting/harvesting dates	:	22	*	14	23	19
Rotate crops to control pests	:	86	81	72	69	74
	:					
Monitoring Practices:	:					
	:					
Scouted for pests	:	75	82	60	87	81
Records kept to track pests	:	45	44	40	49	46
Field mapping of weed problems	:	19	22	9	26	22
Soil analysis to detect pests	:	36	26	43	48	40
Pheromones to monitor pests	:	16	8	*	4	6
	:					
Suppression Practices:	:					
	:					
Seed varieties pesticide resistant	:	*		2	1	1
Additional seed treatments	:	13	*	6	25	15
Scouting used to make decisions	:	40	26	37	42	37
Biological pesticides	:	14	4	15	7	8
Beneficial organisms	:	12		*	10	6
Physical barriers	:	43	33	5	15	21
Adjust planting methods	:	20	*	19	20	17
Alternate pesticides	:	75	71	63	68	68

* Insufficient reports to publish data.

** Less than 1 percent.

Pest Management Practices,
Percent of Farms Utilizing Practice,
Vegetables, 1997

Practice	Region				
	North- East	North Central	South	West	United States
-- Percent of Farms --					
Prevention Practices:					
Tillage/etc. to manage pests	67	33	38	52	50
Remove or plow down crop residue	26	35	45	50	37
Clean implements after fieldwork	22	19	26	45	27
Water management practices	45	10	8	33	26
Avoidance Practices:					
Seed varieties with BT genes	*		*	*	1
Adjust planting/harvesting dates	4	*	9	11	7
Rotate crops to control pests	27	56	32	60	43
Monitoring Practices:					
Scouted for pests	68	57	26	71	58
Records kept to track pests	12	19	8	29	17
Field mapping of weed problems	5	15	3	11	8
Soil analysis to detect pests	12	12	8	21	13
Pheromones to monitor pests	1	1	*	1	1
Suppression Practices:					
Seed varieties pesticide resistant	*		4	7	3
Additional seed treatments	5	*	5	16	7
Scouting used to make decisions	9	19	9	34	17
Biological pesticides	1	1	7	7	3
Beneficial organisms	4		*	15	5
Physical barriers	48	11	12	30	28
Adjust planting methods	9	*	12	23	12
Alternate pesticides	60	31	21	42	41

* Insufficient reports to publish data.

Pest Management Practices,
Percent of Acres Receiving Practice,
All Other Crops and Cropland Pasture, 1997

Practice	Region				
	North- East	North Central	South	West	United States
	-- Percent of Acres --				
Prevention Practices:					
Tillage/etc. to manage pests	51	28	40	55	37
Remove or plow down crop residue	39	17	30	25	24
Clean implements after fieldwork	39	32	39	41	36
Water management practices	12	7	14	30	14
Avoidance Practices:					
Seed varieties with BT genes	*	1	**	**	**
Adjust planting/harvesting dates	11	11	12	14	12
Rotate crops to control pests	49	57	40	49	49
Monitoring Practices:					
Scouted for pests	42	36	35	64	40
Records kept to track pests	10	12	17	22	16
Field mapping of weed problems	14	10	9	28	13
Soil analysis to detect pests	2	4	14	19	10
Pheromones to monitor pests	*	*	2	5	2
Suppression Practices:					
Seed varieties pesticide resistant	**	3	3	4	3
Additional seed treatments	11	10	11	15	11
Scouting used to make decisions	22	15	18	22	17
Biological pesticides	*	**	1	2	1
Beneficial organisms	4	1	**	2	1
Physical barriers	10	12	9	9	11
Adjust planting methods	11	6	8	9	7
Alternate pesticides	29	30	29	40	31

* Insufficient reports to publish data.

** Less than 1 percent.

Pest Management Practices,
Percent of Farms Utilizing Practice,
All Other Crops and Cropland Pasture, 1997

Practice	Region				
	North- East	North Central	South	West	United States
	-- Percent of Farms --				
Prevention Practices:					
Tillage/etc. to manage pests	44	20	27	34	27
Remove or plow down crop residue	15	10	21	19	15
Clean implements after fieldwork	15	19	21	25	20
Water management practices	21	4	7	16	8
Avoidance Practices:					
Seed varieties with BT genes	*	1	**	**	**
Adjust planting/harvesting dates	2	5	6	11	6
Rotate crops to control pests	24	44	22	32	32
Monitoring Practices:					
Scouted for pests	34	19	28	35	25
Records kept to track pests	6	5	7	15	7
Field mapping of weed problems	4	5	3	9	4
Soil analysis to detect pests	4	2	4	11	4
Pheromones to monitor pests	*	*	1	1	1
Suppression Practices:					
Seed varieties pesticide resistant	2	2	4	3	3
Additional seed treatments	4	5	3	12	5
Scouting used to make decisions	5	6	6	14	7
Biological pesticides	*	**	1	1	1
Beneficial organisms	1	**	**	3	1
Physical barriers	23	6	8	7	9
Adjust planting methods	3	4	6	8	5
Alternate pesticides	26	17	16	25	18

* Insufficient reports to publish data.

** Less than 1 percent.

Survey Procedures: The estimates in this report are based on the Fall Agriculture Survey conducted in December, 1997. This survey is based on a probability area frame with a sample of 7,169 segments or parcels of land which average approximately 1 square mile. Enumerators conducting the area survey contact all farmers having operations within the sampled segments and collect a variety of information, including pest management practices for their entire operation. Estimates are then calculated, using the selection probability of each segment.

Estimation Procedures: For each crop/pest management practice combination two ratios were calculated: percent of farms and percent of acres covered by that practice. If a farm operator used a given practice on a specific crop, all acres planted to that crop were considered to have been "treated" with the given pest management practice.

These data will not be revised even if there are subsequent revisions to acreage for a given crop.

Reliability: The probability nature of the survey provides expansion of data so that the estimates are statistically representative of pest management practices on the targeted crops. Reliability of survey results is affected by sampling variability and non-sampling errors. The sampling variability, expressed as a percentage of the estimate, is referred to as the coefficient of variation (cv).

Sampling variability of the estimates differs considerably by crop/pest management practice combination. Some practices are seldom used on certain crops. In general, the more common the pest management practice, the smaller the sampling variability. For commonly used pest management practices, cv's will range from 1-15 percent at the U.S. level and 5-40 percent at the Regional level.

Non-sampling errors occur during a survey process, and unlike sampling variability, are difficult to measure. They may be caused by interviewers failing to follow instructions, poorly worded questions, non-response, problematic survey procedures, or data handling mistakes between collection and publication. In this survey, all survey procedures and analyses were carried out in a consistent and orderly manner to minimize the occurrence of these types of errors.

Terms and Definitions

Agricultural chemicals: Active ingredients in fertilizers and pesticides.

Allelopathic: The release of chemical compounds from a plant that will inhibit the growth of another plant, such as weeds.

Beneficial Insects: Insects collected and introduced into locations because of their value in biologic control as prey on harmful insects and parasites.

Chemigation: Application of an agricultural chemical by injecting it into irrigation water.

Crop year: The period immediately following harvest for the previous crop through harvest of the current crop.

Cultivars: A horticulturally or agriculturally derived variety of a plant, as distinguished from a natural variety.

Farm: Any establishment from which \$1,000 or more of agricultural products were sold or would normally be sold during the year. Government payments are included in sales. Places with all acreage enrolled in set aside or other government programs are considered operating.

Fungi: A lower form of parasitic plant life which often reduces crop production and/or lowers the grade quality of its host.

Land in Farms: All land operated as part of a farming operation during the year. It includes crop and livestock acreage, wasteland, woodland, pasture, land in summer fallow, idle cropland, and land enrolled in the Conservation Reserve Program and other set aside or commodity acreage programs. It excludes public, industrial, and grazing association land and nonagricultural land. It excludes all land operated by establishments not qualifying as farms.

Nematodes: Microscopic, worm-shaped parasitic animals. Damage to many crops can be severe.

Pesticides: As defined by the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), includes any substance or mixture of substances intended for preventing, destroying, repelling or mitigating any pest, and any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant.

Pheromone: A chemical substance produced by an insect which serves as a stimulus to other individuals of the same species for one or more behavioral responses.

SECTION L - PEST MANAGEMENT PRACTICES

1. Did you grow any crops (including grains, row crops, oilseeds, fruits, vegetables or specialty crops) cut hay, or have any cropland pasture on the total acres operated, during 1997?

☐ YES - [Continue.]

☐ NO - [Enter 3 in Code Box 463, and go to Section M.]

499	OFFICE USE COLUMNS IN TABLE	440
-----	--------------------------------	-----

CROP CODES FOR ITEM 3		
191 - Corn	190 - Barley	142 - All Vegetables
26 - Soybeans	1 - Alfalfa Hay	312 - All Fruits & Nuts
8 - Cotton	11 - Other Hay	401 - All Other crops & Cropland Pasture
34 - Wheat		

		COLUMN NUMBER					
		401	402	403	404	405	406
2. What crops were grown on your operation for the 1997 crop year? [List all crops grown during the 1997 crop year.]	Crop						
	Crop Code	441	441	441	441	441	441
3. [Enter crop code for each crop.]							
4. How many acres of each of these crops were grown on the total acres operated during the 1997 crop year?	Acres	442 .	442 .	442 .	442 .	442 .	442 .

Now I have some questions about pest management practices you may have used on this operation for any crops grown during 1997. **By pests, we mean weeds, insects and diseases.** Were any of the following practices used on your operation by you or anyone else?

		If YES, how many acres:					
5. Did you use any seed varieties that were genetically engineered to be pesticide resistant?		443 .	443 .	443 .	443 .	443 .	443 .
6. Did you use any seed varieties with Bt (Bacillus Thuringiensis) genes for insect resistance?		444 .	444 .	444 .	444 .	444 .	444 .
7. Did you use any additional seed treatments that would protect the crop from diseases, weeds or other pests? . . .		445 .	445 .	445 .	445 .	445 .	445 .
If YES, enter Code= 1 for each crop							
8. Were any of the crops on this operation scouted for pests (weeds, insects or disease) using a systematic method? . . .		446	446	446	446	446	446
9. Were electronic or written records kept to track the activity or numbers of different pests?		447	447	447	447	447	447
10. Did you use scouting data and compare it to university or extension guidelines for infestation thresholds to determine when to take measures to control pests?		448	448	448	448	448	448
11. Did you use field mapping of previous weed problems to assist you in making weed management decisions?		449	449	449	449	449	449
12. Did you use soil analysis to detect the presence of pests, such as insects, disease, or nematodes?		450	450	450	450	450	450

SECTION L - PEST MANAGEMENT PRACTICES (continued)

	COLUMN NUMBER					
	401	402	403	404	405	406
Crop						
	If YES, enter Code= 1 for each crop					
13. Did you use pheromones to monitor the presence of pests?	451	451	451	451	451	451
14. Did you use biological pesticides such as Bt (Bacillus Thuringiensis), insect regulators, or mating disruptions to control pests?	452	452	452	452	452	452
15. Did you use beneficial organisms (insects, nematodes or fungi) to control pests?	453	453	453	453	453	453
16. Did you maintain ground covers, mulches or physical barriers to reduce pest problems?	454	454	454	454	454	454
17. Did you use practices such as tilling, mowing, burning or chopping of field lanes or roadways to manage pests?	455	455	455	455	455	455
18. Did you remove or plow down crop residues to control pests?	456	456	456	456	456	456
19. Did you clean tillage or harvesting implements after completing field work for the purpose of reducing the spread of weeds, diseases or other pests?	457	457	457	457	457	457
20. Did you use water management practices, such as controlled drainage or irrigation scheduling, excluding chemigation, to control pests?	458	458	458	458	458	458
21. Did you adjust row spacing, plant density or row direction to control pests?	459	459	459	459	459	459
22. Did you adjust planting or harvesting dates to control pests?	460	460	460	460	460	460
23. Do you alternate pesticides to keep pests from becoming resistant to pesticides?	461	461	461	461	461	461
24. Do you rotate crops for the purpose of controlling pests?	462	462	462	462	462	462
25. How many Acres were Double Cropped in 1997? Acres						<div style="border: 1px solid black; padding: 2px;"> <div style="text-align: right; margin-bottom: 5px;">000</div> <div>844 .</div> </div>

Completion Code for Section L Only

	000
1- Incomplete 3- Valid Zero	463

Index

	Page
Estimation Procedures	28
Highlights	4
Overview	1
Pest Management Practices	
Barley	8
Corn	10
Cotton	12
Hay, Alfalfa	18
Hay, Other	20
Soybeans	14
Wheat	16
Fruits & Nuts	22
Vegetables	24
All Other Crops & Cropland Pasture	26
Planted and Harvested Acres for Selected Crops	6
Reliability	28
Report Features	33
Survey Instrument	30
Survey Procedures	28
Terms and Definitions	29

Report Features

Released August 25, 1998 by the National Agricultural Statistics Service (NASS), Agricultural Statistics Board, U.S. Department of Agriculture. For information on "Pest Management Practices", call (202) 720-2127, office hours 7:30 a.m. to 4:00 p.m. ET.

Listed below are persons within the National Agricultural Statistics Service to contact for additional information.

Glenn Strasburg, Environmental Statistician	(202) 720-7492
James A. Ewing, Environmental Statistician	(202) 690-2284

C. Ray Halley, Chief, Crops Branch	(202) 720-2127
Bill Dowdy, Head, Field Crops Section	(202) 720-3843
Dean Groskurth, Head, Fruits, Vegetable and Special Crops Section	(202) 720-3843

The United States Department of Agriculture (USDA) prohibits discrimination in all its programs on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (braille, large print, audiotope, etc.) should contact the USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, D.C., 20250-9410, or call 202-720-5964 (voice or TDD). USDA is an equal opportunity provider and employer.

ACCESS TO REPORTS!!

For your convenience, there are several ways to obtain NASS reports, data products, and services:

INTERNET ACCESS

All NASS reports are available free of charge on the worldwide Internet. For access, connect to the Internet and go to the NASS Home Page at: <http://www.usda.gov/nass/>. Select "Today's Reports" or Publications and then Reports by Calendar or Publications and then Search, by Title or Subject.

E-MAIL SUBSCRIPTION

All NASS reports are available by subscription free of charge direct to your e-mail address. Send an e-mail message to: usda-reports@usda.mannlib.cornell.edu. In the body of the message type the word: **list**.

AUTOFAX ACCESS

NASSFax service is available for some reports from your fax machine. Please call 202-720-2000, using the handset attached to your fax. Respond to the voice prompts. Document 0411 is a list of available reports.

----- PRINTED REPORTS OR DATA PRODUCTS

CALL OUR TOLL-FREE ORDER DESK: 800-999-6779 (U.S. and Canada)
Other areas, please call 703-834-0125 FAX: 703-834-0110
(Visa, MasterCard, check, or money order acceptable for payment.)

ASSISTANCE

For **assistance** with general agricultural statistics or further information about NASS or its products or services, contact the **Agricultural Statistics Hotline** at **800-727-9540**, 7:30 a.m. to 4:00 p.m. ET, or e-mail: nass@nass.usda.gov.