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Agricultural Chemical Usage
1990 Field Crops Summary

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Overview

This is the first of a series of NASS publications covering on-farm fertilizer and agricultural chemical use. The data presented in this publication were funded through the President's Water Quality Initiative and begin the process of developing a data series on chemical use.

The Water Quality Initiative is a multi-agency program designed to provide farmers, ranchers, and foresters the knowledge and technical means to respond independently and voluntarily to on and off-farm environmental concerns. In the past, farm level data have been inadequate to determine the magnitude of water quality problems or the benefits and costs of alternative solutions for the farmer and other affected parties. These data will help fill some of the data needs that analysts require to find solutions to the complex environmental issues of the 1990's.

On-farm fertilizer and chemical use data for 1990 corn, cotton, potatoes, rice, soybeans, winter wheat, other spring wheat, and durum wheat are included in this publication. A second Agricultural Chemical Usage publication covering 1990 vegetables and melons will be issued June 25, 1991. Published States will include Arizona, California, Florida, Michigan, and Texas. Subscription ordering information covering all available reports is included in the back of this publication.

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The Survey

The information presented in this publication is a result of sample surveys conducted during the 1990 crop year. Chemical use data were collected on winter wheat beginning in late May 1990, while data collection for corn, cotton, rice, soybeans, other spring wheat, and durum wheat began in late July 1990. The potato data collection period varied by State but most activity occurred in early Fall. A total of 15,025 sample fields were included in the 1990 survey program.

A random sample of fields was selected for each crop so that the probability of selecting a particular field was directly proportional to the total acres planted to that crop in the State. Thus, each acre planted to a crop had exactly the same chance of selection. For winter wheat, the selection was based on acres standing for harvest rather than acres planted. Farmers operating the sample fields were contacted and they supplied information on chemical applications made to those specific fields.

The lists of fields and crops from which the sample fields were selected came from information obtained through two surveys of farm operators conducted earlier in the year. The survey for winter wheat acreages was conducted in March and the survey for other crops in June. In each case, small areas of land, called segments, were screened throughout the country to determine which crops were growing. For winter wheat, rice, and potatoes, these area segments were supplemented with lists of farm operators to increase sampling efficiency.

Highlights

Herbicides in the 47 **corn** States surveyed were used on 92.4 percent of the acreage and insecticides were used on 30.9 percent of the acreage. Nitrogen, phosphate, and potash fertilizers were applied to large percentages of the total acres, at 96.1 percent, 83.3 percent, and 74.1 percent, respectively. The two most commonly used herbicides were atrazine and metolachlor, which were used on 64 percent and 26 percent of the acreage, respectively. The most commonly used insecticide was terbufos at 12 percent of acres treated.

Herbicides in the six largest **Upland cotton** producing States were used on 94.6 percent of the acreage. Nitrogen fertilizer was applied to 79.2 percent of the acreage, while phosphate and potash were applied on 48.5 and 30.6 percent of the acreage, respectively. The two most commonly used herbicides were trifluralin and fluometuron, which were used on 64 percent and 26 percent of the acreage, respectively.

In eleven **fall season potato** States, herbicides were used on 79.2 percent of the acreage and insecticides on 88.2 percent. Nitrogen, phosphate, and potash fertilizers were applied to large percentages of the total acres, at 98.0 percent, 96.9 percent, and 89.1 percent, respectively. Fungicides and vine killers were also applied on 67.1 and 32.9 percent of the total acres, respectively.

Rice herbicides in Arkansas and Louisiana were applied to 97.5 percent of the acreage. Insecticides and fungicides were also applied to 10.4 percent and 11.9 percent of the acreage, respectively. Nitrogen use was widespread with treatments made on 97.2 percent of the acreage. Phosphate and potash were applied on much less acreage, 35.3 and 36.6 percent, respectively. The two most commonly used herbicides were propanil and molinate, which were used on 84 percent and 42 percent of the acreage, respectively.

Herbicides were used on 94.8 percent of the acreage in the 29 **soybean** States surveyed. Insecticides and fungicides were not used on a significant portion of the acres in the 29 States. Nitrogen fertilizer was applied to 20.5 percent of the acreage, while phosphate and potash were applied on 27.2 and 30.1 percent of the acreage, respectively. The two most commonly used herbicides were trifluralin and chlorimuron-ethyl, which were used on 37 percent and 20 percent of the acreage, respectively.

Winter wheat was surveyed in 12 States. Herbicides were used on 34 percent of the acreage. Insecticide and fungicide use were also collected, although these pesticides were not used on significant acreages at the 12 State level. Nitrogen was applied on 83.7 percent of the acreage. Phosphate and potash were applied on 47.8 and 18.1 percent of the acreage, respectively. The two most commonly used herbicides were 2,4-D and chlorsulfuron, which were used on 16 percent and 13 percent of the acreage, respectively.

Herbicides were used on 89 percent of the **other spring wheat** acreage in the 4 States surveyed. Insecticides and fungicides were used by growers, but not on a significant portion of the acreage. A total of 68.4 percent of the acreage was treated with nitrogen fertilizer. Phosphate and potash were applied on 61.0 and 24.3 percent of the acreage, respectively. The two most commonly used herbicides were 2,4-D and MCPA, which were used on 53 percent and 32 percent of the acreage, respectively.

In North Dakota, **durum wheat** growers applied herbicides to 90 percent of the acreage. Data about insecticides and fungicides were collected but amount of acreage receiving these chemicals was not significant. A total of 58.0 percent of the acreage received a nitrogen fertilizer treatment and phosphate was applied on 56.0 percent of the acreage. Relatively little potash was applied. The two most commonly used herbicides were also 2,4-D and MCPA, which were used on 50 and 34 percent of the acreage, respectively.

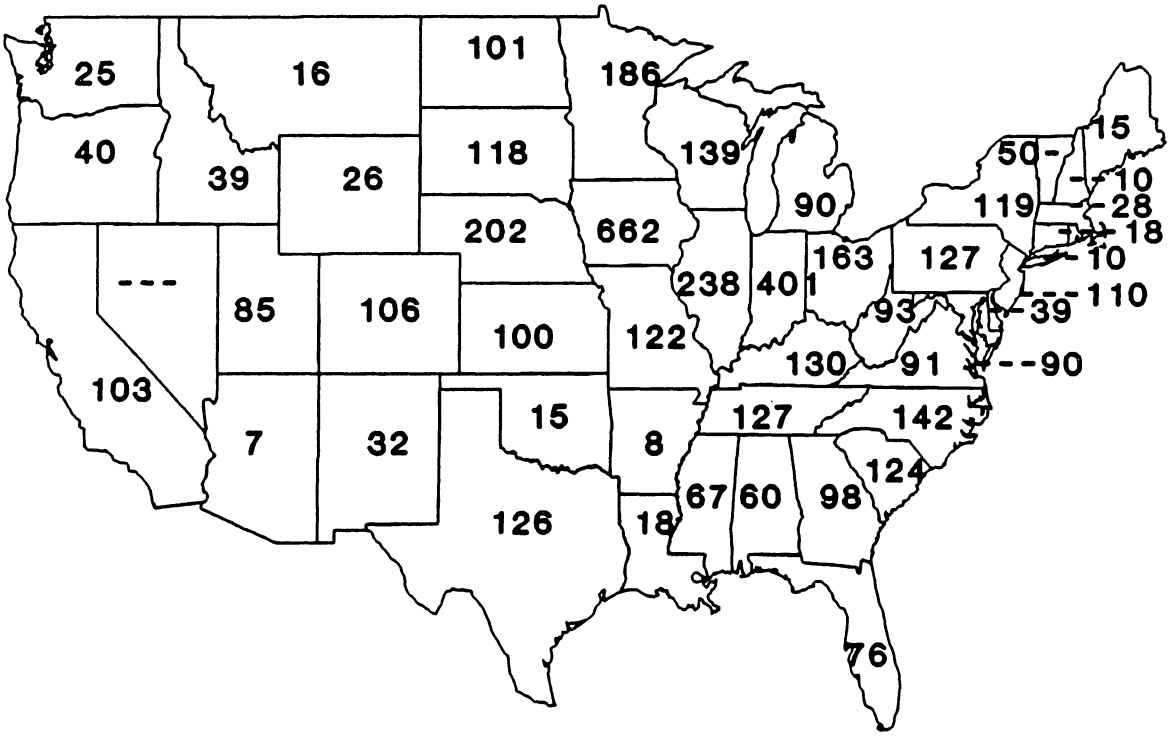
Corn

Nitrogen was applied to 96 percent of the total corn acreage in 1990. Most major producing States in the survey reported 80 percent or more of the acreage treated. The exception was South Dakota with 74 percent. All States averaged less than two treatments per acre with the exception of Indiana, North Carolina, and Ohio which averaged slightly more than two treatments. Rates per application were highest in Missouri and lowest in Pennsylvania. Phosphate use varied by State with a low of 56 percent of the acreage treated in South Dakota to a high of 99 percent in New York. Eighty three percent of the U.S. corn acreage received phosphate fertilizer. Potash use varied but was in the 80 to 90 percent range for the major corn producing States. The exceptions were Kansas, South Dakota, and Nebraska with only 24, 32, and 34 percent respectively. Approximately 74 percent of the U.S. acreage had potash fertilizer applied.

Herbicides were applied to 92 percent of the total corn acreage while insecticides were used on less than one third of the acreage. Atrazine was the most used herbicide with 64 percent of the U.S. acreage receiving treatment. Average number of applications were consistent among States at slightly above one treatment. Rates per application average 1.1 pounds. Other widely used herbicides by corn growers were alachlor and metolachlor and each were applied to about 25 percent of the acreage. These three herbicides account for more than half of all pesticides used on corn and are used primarily to control broadleaf and grass weeds.

NOTE: Additional State funding by Indiana and Iowa made it possible to select a larger sample in these two States allowing for publication of more detailed pesticide data. For other States the sample was too thin for some products to be published separately.

Corn: Number of Usable Reports, 1990



Corn: Total Acreage and Percentage of Acreage Receiving Fertilizer Applications of Primary Plant Nutrients, Major States and Regions, 1990

State	Area Planted	Area Receiving 1/ Nitrogen	Phosphate	Potash
	1,000 Acres	Percent		
CO	950	95	65	28
IL	10,600	100	91	89
IN	5,600	99	96	88
IA	12,800	96	82	80
KS	1,600	100	62	24
KY	1,350	99	84	76
MI	2,400	97	91	96
MN	6,700	98	90	87
MO	2,100	95	80	80
NE	7,700	98	68	34
NY	1,210	100	99	97
NC	1,200	93	87	88
ND	850	80	63	40
OH	3,700	99	93	88
PA	1,380	95	93	87
SC	390	88	93	93
SD	3,400	74	56	32
TN	620	99	98	98
VA	530	92	87	87
WV	90	98	92	92
WI	3,700	99	96	95
REG 1	965	91	61	40
REG 2	2,035	88	65	33
REG 3	1,245	98	91	90
REG 4	1,056	91	83	83
Total	74,171	96.1	83.3	74.1

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.
Reg 1: AZ, CA, ID, MT, NM, OR, UT, WA, WY.
Reg 2: AR, LA, OK, TX.
Reg 3: AL, FL, GA, MS.
Reg 4: CT, DE, MA, MD, ME, NH, NJ, RI, VT.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Corn: Frequency and Extent of Nitrogen Fertilizer Usage, Major States and Regions, 1990

State	Area Planted	Area Applied 1/	Appli-cations	Rate per Application	Rate per Crop Year	Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	Million Pounds
CO	950	95	1.78	81	144	130
IL	10,600	100	1.68	98	164	1,738
IN	5,600	99	2.13	67	142	787
IA	12,800	96	1.58	80	127	1,561
KS	1,600	100	1.66	70	117	187
KY	1,350	99	1.42	99	140	187
MI	2,400	97	1.93	65	125	291
MN	6,700	98	1.77	64	113	742
MO	2,100	95	1.19	113	134	267
NE	7,700	98	1.85	78	144	1,087
NY	1,210	100	1.53	50	77	93
NC	1,200	93	2.04	67	137	153
ND	850	80	1.32	52	69	47
OH	3,700	99	2.07	72	149	546
PA	1,380	95	1.63	46	75	98
SC	390	88	1.69	82	139	48
SD	3,400	74	1.33	60	80	201
TN	620	99	1.36	99	134	82
VA	530	92	1.46	66	96	47
WV	90	98	1.65	58	96	8
WI	3,700	99	1.66	47	78	286
Reg 1	965	91	1.53	92	140	123
Reg 2	2,035	88	1.75	90	158	283
Reg 3	1,245	98	1.79	65	117	143
Reg 4	1,056	91	1.75	62	109	105
Total	74,171	96.1	1.72	75.3	129.6	9,240

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.
Reg 1: AZ, CA, ID, MT, NM, OR, UT, WA, WY.
Reg 2: AR, LA, OK, TX.
Reg 3: AL, FL, GA, MS.
Reg 4: CT, DE, MA, MD, ME, NH, NJ, RI, VT.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Corn: Frequency and Extent of Phosphate Fertilizer Usage, Major States and Regions, 1990

State	Area Planted	Area Applied 1/	Appli-cations	Rate per Application	Rate per Crop Year	Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	Million Pounds
CO	950	65	1.14	37	42	26
IL	10,600	91	1.05	77	81	781
IN	5,600	96	1.33	59	78	419
IA	12,800	82	1.09	53	58	609
KS	1,600	62	1.06	39	41	41
KY	1,350	84	1.03	76	78	88
MI	2,400	91	1.06	50	53	116
MN	6,700	90	1.14	44	50	302
MO	2,100	80	1.03	56	58	97
NE	7,700	68	1.02	30	31	162
NY	1,210	99	1.05	53	56	67
NC	1,200	87	1.15	53	61	64
ND	850	63	1.02	32	33	18
OH	3,700	93	1.20	59	71	244
PA	1,380	93	1.15	51	59	76
SC	390	93	1.06	55	58	21
SD	3,400	56	1.03	41	42	80
TN	620	98	1.06	75	79	48
VA	530	87	1.05	66	69	32
WV	90	92	1.19	45	54	4
WI	3,700	96	1.08	47	51	181
Reg 1	965	61	1.06	60	64	38
Reg 2	2,035	65	1.05	48	50	66
Reg 3	1,245	91	1.09	50	55	62
Reg 4	1,056	83	1.16	48	56	49
Total	74,171	83.3	1.10	54.3	59.7	3,691

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.
Reg 1: AZ, CA, ID, MT, NM, OR, UT, WA, WY.
Reg 2: AR, LA, OK, TX.
Reg 3: AL, FL, GA, MS.
Reg 4: CT, DE, MA, MD, ME, NH, NJ, RI, VT.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Corn: Frequency and Extent of Potash Fertilizer Usage,
Major States and Regions, 1990

State	Area Planted	Area Applied 1/	Applications	Rate per Application	Rate per Crop Year	Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	Million Pounds
CO	950	28	1.17	25	29	8
IL	10,600	89	1.03	104	107	1,009
IN	5,600	88	1.19	94	112	552
IA	12,800	80	1.09	68	74	758
KS	1,600	24	1.00	34	34	13
KY	1,350	76	1.01	86	87	89
MI	2,400	96	1.29	76	98	226
MN	6,700	87	1.14	60	68	396
MO	2,100	80	1.03	78	80	134
NE	7,700	34	1.16	19	22	58
NY	1,210	97	1.11	54	60	70
NC	1,200	88	1.10	91	100	106
ND	850	40	1.00	22	22	7
OH	3,700	88	1.32	75	99	322
PA	1,380	87	1.18	40	47	56
SC	390	93	1.01	98	99	36
SD	3,400	32	1.03	23	24	26
TN	620	98	1.04	78	81	49
VA	530	87	1.06	87	92	42
WV	90	92	1.16	61	71	6
WI	3,700	95	1.17	62	72	253
Reg 1	965	40	1.07	66	71	27
Reg 2	2,035	33	1.02	39	40	27
Reg 3	1,245	90	1.03	70	72	81
Reg 4	1,056	83	1.16	68	79	69
Total	74,171	74.1	1.12	71.8	80.4	4,420

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.
Reg 1 : AZ, CA, ID, MT, NM, OR, UT, WA, WY.
Reg 2 : AR, LA, OK, TX.
Reg 3 : AL, FL, GA, MS.
Reg 4 : CT, DE, MA, MD, ME, NH, NJ, RI, VT.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey
National Agricultural Statistics Service, USDA.

Corn: Total Acreage and Percentage of Acreage Receiving Herbicide Applications, Major States and Regions, 1990

State	Area Planted	Area Receiving Herbicides 1/
	1,000 Acres	Percent
CO	950	89
IL	10,600	98
IN	5,600	96
IA	12,800	95
KS	1,600	88
KY	1,350	99
MI	2,400	93
MN	6,700	96
MO	2,100	89
NE	7,700	94
NY	1,210	95
NC	1,200	95
ND	850	71
OH	3,700	95
PA	1,380	95
SC	390	98
SD	3,400	84
TN	620	93
VA	530	91
WV	90	94
WI	3,700	89
REG 1	965	57
REG 2	2,035	68
REG 3	1,245	73
REG 4	1,056	94
Total	74,171	92.4

1/ Refers to acres receiving one or more applications of a herbicide.
Reg 1: AZ, CA, ID, MT, NM, OR, UT, WA, WY.
Reg 2: AR, LA, OK, TX.
Reg 3: AL, FL, GA, MS.
Reg 4: CT, DE, MA, MD, ME, NH, NJ, RI, VT.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Corn: Total Acreage and Percentage of Acreage Receiving Insecticide Applications, Major States and Regions, 1990

State	Area Planted	Area Receiving Insecticides 1/
	1,000 Acres	Percent
CO	950	51
IL	10,600	37
IN	5,600	35
IA	12,800	34
KS	1,600	45
KY	1,350	8
MI	2,400	29
MN	6,700	14
MO	2,100	31
NE	7,700	50
NY	1,210	11
NC	1,200	19
ND	850	12
OH	3,700	25
PA	1,380	28
SC	390	23
SD	3,400	11
TN	620	11
VA	530	23
WV	90	18
WI	3,700	36
REG 1	965	36
REG 2	2,035	41
REG 3	1,245	7
REG 4	1,056	23
Total	74,171	30.9

1/ Refers to acres receiving one or more applications of an insecticide.
Reg 1: AZ, CA, ID, MT, NM, OR, UT, WA, WY.
Reg 2: AR, LA, OK, TX.
Reg 3: AL, FL, GA, MS.
Reg 4: CT, DE, MA, MD, ME, NH, NJ, RI, VT.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Corn: Frequency and Extent of 2,4-D Usage,
Major States and Regions, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO	950	24	1.00	0.22	0.22	50
IL	10,600	13	1.03	0.50	0.51	703
IN	5,600	10	1.18	0.40	0.47	263
IA	12,800	15	1.00	0.43	0.43	826
KS 2/	1,600					
KY 2/	1,350					
MI 2/	2,400					
MN	6,700	17	1.16	0.41	0.48	547
MO 2/	2,100					
NE	7,700	12	1.00	0.41	0.41	379
NY 2/	1,210					
NC	1,200	29	1.02	0.48	0.49	171
ND 2/	850					
OH	3,700	15	1.00	0.52	0.52	289
PA 2/	1,380					
SC 2/	390					
SD	3,400	19	1.00	0.33	0.33	213
TN 2/	620					
VA 2/	530					
WV	90	23	1.10	0.44	0.48	10
WI 2/	3,700					
REG 1	965	17	1.00	0.53	0.53	87
REG 2	2/ 2,035					
REG 3	1,245	5	1.17	0.55	0.64	40
REG 4	1,056	7	1.00	0.54	0.54	40
Total	74,171	11.7	1.04	0.44	0.46	4,022

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.
Reg 1: AZ, CA, ID, MT, NM, OR, UT, WA, WY.
Reg 2: AR, LA, OK, TX.
Reg 3: AL, FL, GA, MS.
Reg 4: CT, DE, MA, MD, ME, NH, NJ, RI, VT.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Corn: Frequency and Extent of Alachlor Usage,
Major States and Regions, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO	950	24	1.13	2.38	2.69	613
IL	10,600	24	1.02	2.39	2.44	6,207
IN	5,600	43	1.02	2.07	2.11	5,081
IA	12,800	22	1.04	2.12	2.20	6,195
KS	1,600	27	1.00	1.82	1.82	786
KY	1,350	15	1.00	2.24	2.24	454
MI	2,400	22	1.00	1.94	1.94	1,024
MN	6,700	17	1.00	2.56	2.56	2,916
MO	2,100	23	1.00	1.96	1.96	947
NE	7,700	39	1.04	1.30	1.35	4,054
NY	1,210	12	1.00	1.63	1.63	237
NC	1,200	43	1.00	1.66	1.66	857
ND	850	6	1.00	1.70	1.70	87
OH	3,700	30	1.04	2.01	2.09	2,320
PA	1,380	17	1.00	1.57	1.57	368
SC	390	24	1.00	1.46	1.46	137
SD	3,400	27	1.00	1.33	1.33	1,221
TN	620	30	1.05	1.87	1.96	365
VA	530	20	1.00	1.68	1.68	178
WV	90	28	1.00	1.77	1.77	45
WI	3,700	18	1.00	1.72	1.72	1,146
REG 1	965	9	1.03	1.74	1.79	155
REG 2	2,035	9	1.00	1.18	1.18	216
REG 3	1,245	8	1.20	1.21	1.45	144
REG 4	1,056	12	1.05	1.82	1.91	242
Total	74,171	24.6	1.02	1.93	1.97	35,995

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
Reg 1: AZ, CA, ID, MT, NM, OR, UT, WA, WY.
Reg 2: AR, LA, OK, TX.
Reg 3: AL, FL, GA, MS.
Reg 4: CT, DE, MA, MD, ME, NH, NJ, RI, VT.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey
National Agricultural Statistics Service, USDA.

Corn: Frequency and Extent of Atrazine Usage,
Major States and Regions, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO	950	52	1.06	1.29	1.37	677
IL	10,600	73	1.06	1.15	1.22	9,440
IN	5,600	87	1.07	1.21	1.30	6,334
IA	12,800	58	1.05	0.89	0.93	6,904
KS	1,600	74	1.01	1.16	1.17	1,385
KY	1,350	94	1.10	1.31	1.44	1,827
MI	2,400	79	1.15	1.30	1.50	2,844
MN	6,700	28	1.02	0.98	1.00	1,876
MO	2,100	78	1.07	1.28	1.37	2,244
NE	7,700	78	1.22	0.93	1.13	6,787
NY	1,210	76	1.04	1.57	1.63	1,499
NC	1,200	78	1.00	1.16	1.16	1,086
ND	850	17	1.00	1.32	1.32	191
OH	3,700	81	1.12	1.29	1.45	4,346
PA	1,380	83	1.05	1.21	1.27	1,455
SC	390	79	1.14	1.18	1.34	413
SD	3,400	17	1.05	0.87	0.91	526
TN	620	87	1.05	1.54	1.62	874
VA	530	78	1.04	1.42	1.48	612
WV	90	91	1.04	1.44	1.50	123
WI	3,700	58	1.01	1.29	1.30	2,790
REG 1	965	16	1.00	1.23	1.23	190
REG 2	2,035	60	1.04	0.93	0.97	1,184
REG 3	1,245	62	1.09	1.49	1.62	1,250
REG 4	1,056	84	1.06	1.35	1.43	1,268
Total	74,171	64.3	1.08	1.13	1.22	58,125

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
Reg 1: AZ, CA, ID, MT, NM, OR, UT, WA, WY.
Reg 2: AR, LA, OK, TX.
Reg 3: AL, FL, GA, MS.
Reg 4: CT, DE, MA, MD, ME, NH, NJ, RI, VT.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey
National Agricultural Statistics Service, USDA.

Corn: Frequency and Extent of Bromoxynil Usage,
Major States and Regions, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO 2/	950					
IL	10,600	6	1.00	0.27	0.27	172
IN 2/	5,600					
IA	12,800	18	1.03	0.26	0.27	622
KS 2/	1,600					
KY 2/	1,350					
MI 2/	2,400					
MN	6,700	10	1.00	0.27	0.27	181
MO 2/	2,100					
NE 2/	7,700					
NY 2/	1,210					
NC 2/	1,200					
ND 2/	850					
OH 2/	3,700					
PA 2/	1,380					
SC 2/	390					
SD 2/	3,400					
TN 2/	620					
VA 2/	530					
WV 2/	90					
WI 2/	3,700					
REG 1	2/ 965					
REG 2	2/ 2,035					
REG 3	2/ 1,245					
REG 4	2/ 1,056					
Total	74,171	5.8	1.02	0.26	0.27	1,155

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.
Reg 1: AZ, CA, ID, MT, NM, OR, UT, WA, WY.
Reg 2: AR, LA, OK, TX.
Reg 3: AL, FL, GA, MS.
Reg 4: CT, DE, MA, MD, ME, NH, NJ, RI, VT.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Corn: Frequency and Extent of Butylate Usage,
Major States and Regions, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO 2/	950					
IL	10,600	9	1.00	3.66	3.66	3,492
IN	5,600	10	1.00	4.35	4.35	2,436
IA 2/	12,800					
KS 2/	1,600					
KY	1,350	29	1.00	4.17	4.17	1,633
MI 2/	2,400					
MN 2/	6,700					
MO 2/	2,100					
NE	7,700	8	1.00	3.77	3.77	2,322
NY 2/	1,210					
NC	1,200	12	1.00	3.43	3.43	494
ND 2/	850					
OH 2/	3,700					
PA 2/	1,380					
SC 2/	390					
SD 2/	3,400					
TN	620	10	1.00	4.24	4.24	263
VA 2/	530					
WV	90	17	1.00	4.75	4.75	73
WI 2/	3,700					
REG 1	2/ 965					
REG 2	2/ 2,035					
REG 3	2/ 1,245					
REG 4	2/ 1,056					
Total	74,171	4.8	1.01	3.94	3.98	14,181

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.
Reg 1: AZ, CA, ID, MT, NM, OR, UT, WA, WY.
Reg 2: AR, LA, OK, TX.
Reg 3: AL, FL, GA, MS.
Reg 4: CT, DE, MA, MD, ME, NH, NJ, RI, VT.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey
National Agricultural Statistics Service, USDA.

Corn: Frequency and Extent of Carbofuran Usage,
Major States and Regions, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO 2/	950					
IL	10,600	3	1.17	1.03	1.21	385
IN 2/	5,600					
IA 2/	12,800					
KS	1,600	11	1.00	1.00	1.00	176
KY 2/	1,350					
MI 2/	2,400					
MN 2/	6,700					
MO 2/	2,100					
NE	7,700	6	1.00	0.86	0.86	397
NY 2/	1,210					
NC 2/	1,200					
ND 2/	850					
OH 2/	3,700					
PA	1,380	12	1.00	1.14	1.14	189
SC 2/	390					
SD 2/	3,400					
TN 2/	620					
VA 2/	530					
WV 2/	90					
WI 2/	3,700					
REG 1	2/ 965					
REG 2	2,035	10	1.34	0.68	0.91	185
REG 3	2/ 1,245					
REG 4	1,056	6	1.00	1.33	1.33	84
Total	74,171	3.1	1.05	1.09	1.14	2,612

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.
Reg 1: AZ, CA, ID, MT, NM, OR, UT, WA, WY.
Reg 2: AR, LA, OK, TX.
Reg 3: AL, FL, GA, MS.
Reg 4: CT, DE, MA, MD, ME, NH, NJ, RI, VT.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Corn: Frequency and Extent of Chlorpyrifos Usage,
Major States and Regions, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO 2/	950					
IL	10,600	8	1.00	1.62	1.62	1,374
IN	5,600	5	1.00	1.32	1.32	370
IA	12,800	7	1.00	1.14	1.14	1,021
KS 2/	1,600					
KY 2/	1,350					
MI 2/	2,400					
MN 2/	6,700					
MO	2,100	8	1.00	1.37	1.37	230
NE	7,700	11	1.14	1.11	1.26	1,067
NY 2/	1,210					
NC 2/	1,200					
ND 2/	850					
OH	3,700	8	1.00	1.08	1.08	320
PA 2/	1,380					
SC 2/	390					
SD 2/	3,400					
TN 2/	620					
VA 2/	530					
WV 2/	90					
WI	3,700	7	1.00	1.53	1.53	396
REG 1	2/ 965					
REG 2	2/ 2,035					
REG 3	2/ 1,245					
REG 4	2/ 1,056					
Total	74,171	6.1	1.03	1.21	1.25	5,642

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.
Reg 1: AZ, CA, ID, MT, NM, OR, UT, WA, WY.
Reg 2: AR, LA, OK, TX.
Reg 3: AL, FL, GA, MS.
Reg 4: CT, DE, MA, MD, ME, NH, NJ, RI, VT.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Corn: Frequency and Extent of Cyanazine Usage,
Major States and Regions, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO	950	21	1.00	0.85	0.85	170
IL	10,600	16	1.03	1.99	2.05	3,477
IN	5,600	18	1.04	1.82	1.89	1,905
IA	12,800	18	1.03	1.92	1.98	4,562
KS	1,600	9	1.00	1.69	1.69	243
KY	1,350	6	1.00	1.30	1.30	105
MI	2,400	18	1.00	1.40	1.40	605
MN	6,700	29	1.02	1.79	1.83	3,556
MO	2,100	25	1.00	2.05	2.05	1,076
NE	7,700	20	1.05	1.31	1.38	2,125
NY	1,210	19	1.00	1.75	1.75	402
NC 2/	1,200					
ND	850	27	1.00	1.19	1.19	273
OH	3,700	25	1.00	1.90	1.90	1,758
PA	1,380	20	1.00	1.49	1.49	411
SC	390	14	1.00	1.64	1.64	90
SD	3,400	9	1.00	1.19	1.19	364
TN 2/	620					
VA	530	9	1.00	0.91	0.91	43
WV	90	10	1.00	2.95	2.95	27
WI	3,700	28	1.00	1.64	1.64	1,699
REG 1	965	7	1.00	1.21	1.21	82
REG 2	2/ 2,035					
REG 3	2/ 1,245					
REG 4	1,056	16	1.02	1.51	1.54	260
Total	74,171	17.9	1.02	1.73	1.76	23,375

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.
Reg 1: AZ, CA, ID, MT, NM, OR, UT, WA, WY.
Reg 2: AR, LA, OK, TX.
Reg 3: AL, FL, GA, MS.
Reg 4: CT, DE, MA, MD, ME, NH, NJ, RI, VT.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Corn: Frequency and Extent of Dicamba Usage,
Major States and Regions, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO	950	35	1.00	0.27	0.27	90
IL	10,600	20	1.02	0.39	0.40	848
IN	5,600	14	1.00	0.34	0.34	267
IA	12,800	21	1.01	0.31	0.31	833
KS 2/	1,600					
KY 2/	1,350					
MI	2,400	11	1.00	0.41	0.41	108
MN	6,700	37	1.00	0.35	0.35	868
MO 2/	2,100					
NE	7,700	9	1.15	0.30	0.35	243
NY	1,210	8	1.00	0.21	0.21	20
NC	1,200	7	1.00	0.35	0.35	29
ND	850	10	1.10	0.22	0.24	20
OH	3,700	28	1.02	0.31	0.32	332
PA	1,380	12	1.00	0.38	0.38	63
SC 2/	390					
SD	3,400	36	1.02	0.28	0.29	355
TN 2/	620					
VA	530	11	1.00	0.38	0.38	22
WV	90	22	1.00	0.27	0.27	5
WI	3,700	17	1.00	0.36	0.36	226
REG 1	965	13	1.10	0.26	0.29	36
REG 2	2/ 2,035					
REG 3	2/ 1,245					
REG 4	1,056	6	1.09	0.28	0.30	19
Total	74,171	17.9	1.02	0.33	0.34	4,478

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.
Reg 1: AZ, CA, ID, MT, NM, OR, UT, WA, WY.
Reg 2: AR, LA, OK, TX.
Reg 3: AL, FL, GA, MS.
Reg 4: CT, DE, MA, MD, ME, NH, NJ, RI, VT.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey
National Agricultural Statistics Service, USDA.

Corn: Frequency and Extent of EPTC Usage,
Major States and Regions, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO 2/	950					
IL	10,600	7	1.00	3.82	3.82	2,834
IN 2/	5,600					
IA	12,800	14	1.00	4.39	4.39	7,867
KS 2/	1,600					
KY 2/	1,350					
MI 2/	2,400					
MN	6,700	30	1.00	4.76	4.76	9,568
MO 2/	2,100					
NE 2/	7,700					
NY 2/	1,210					
NC	1,200	8	1.00	4.48	4.48	430
ND	850	23	1.00	3.89	3.89	760
OH 2/	3,700					
PA 2/	1,380					
SC 2/	390					
SD	3,400	25	1.00	4.41	4.41	3,749
TN	620	13	1.00	4.87	4.87	393
VA 2/	530					
WV 2/	90					
WI	3,700	9	1.00	4.62	4.62	1,538
REG 1	965	10	1.00	3.75	3.75	362
REG 2	2/ 2,035					
REG 3	2/ 1,245					
REG 4	2/ 1,056					
Total	74,171	9.3	1.00	4.43	4.43	30,581

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.
Reg 1: AZ, CA, ID, MT, NM, OR, UT, WA, WY.
Reg 2: AR, LA, OK, TX.
Reg 3: AL, FL, GA, MS.
Reg 4: CT, DE, MA, MD, ME, NH, NJ, RI, VT.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey
National Agricultural Statistics Service, USDA.

Corn: Frequency and Extent of Fonofos Usage,
Major States and Regions, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO 2/	950					
IL	10,600	6	1.00	1.06	1.06	674
IN	5,600	6	1.00	1.10	1.10	370
IA	12,800	4	1.00	0.83	0.83	425
KS 2/	1,600					
KY 2/	1,350					
MI	2,400	7	1.00	1.12	1.12	188
MN 2/	6,700					
MO 2/	2,100					
NE	7,700	5	1.00	1.06	1.06	408
NY 2/	1,210					
NC 2/	1,200					
ND 2/	850					
OH	3,700	5	1.00	1.11	1.11	205
PA 2/	1,380					
SC 2/	390					
SD 2/	3,400					
TN 2/	620					
VA 2/	530					
WV 2/	90					
WI 2/	3,700					
REG 1	2/ 965					
REG 2	2/ 2,035					
REG 3	2/ 1,245					
REG 4	2/ 1,056					
Total	74,171	3.6	1.00	1.06	1.06	2,823

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.
Reg 1: AZ, CA, ID, MT, NM, OR, UT, WA, WY.
Reg 2: AR, LA, OK, TX.
Reg 3: AL, FL, GA, MS.
Reg 4: CT, DE, MA, MD, ME, NH, NJ, RI, VT.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey
National Agricultural Statistics Service, USDA.

Corn: Frequency and Extent of Metolachlor Usage,
Major States and Regions, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO	950	13	1.00	1.27	1.27	157
IL	10,600	36	1.00	1.90	1.90	7,250
IN	5,600	23	1.00	1.75	1.75	2,254
IA	12,800	35	1.01	2.14	2.16	9,677
KS	1,600	25	1.00	1.83	1.83	732
KY	1,350	19	1.00	1.81	1.81	464
MI	2,400	32	1.00	1.70	1.70	1,306
MN	6,700	19	1.00	2.15	2.15	2,737
MO	2,100	20	1.04	1.70	1.77	743
NE	7,700	19	1.00	1.23	1.23	1,799
NY	1,210	35	1.00	1.99	1.99	843
NC	1,200	18	1.00	1.51	1.51	326
ND 2/	850					
OH	3,700	28	1.00	1.91	1.91	1,979
PA	1,380	47	1.07	1.60	1.71	1,109
SC	390	30	1.11	1.32	1.47	172
SD	3,400	8	1.11	1.75	1.94	528
TN	620	14	1.00	1.54	1.54	134
VA	530	42	1.05	1.71	1.80	401
WV	90	20	1.11	1.87	2.08	37
WI	3,700	16	1.00	2.14	2.14	1,267
REG 1	2/ 965					
REG 2	2,035	24	1.05	0.93	0.98	479
REG 3	1,245	10	1.00	1.40	1.40	174
REG 4	1,056	62	1.06	1.81	1.92	1,257
Total	74,171	25.9	1.01	1.85	1.87	35,938

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.
Reg 1: AZ, CA, ID, MT, NM, OR, UT, WA, WY.
Reg 2: AR, LA, OK, TX.
Reg 3: AL, FL, GA, MS.
Reg 4: CT, DE, MA, MD, ME, NH, NJ, RI, VT.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey
National Agricultural Statistics Service, USDA.

Corn: Frequency and Extent of Terbufos Usage,
Major States and Regions, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO	950	28	1.00	1.08	1.08	287
IL	10,600	13	1.00	1.22	1.22	1,681
IN	5,600	15	1.00	1.14	1.14	958
IA	12,800	16	1.00	1.11	1.11	2,273
KS 2/	1,600					
KY 2/	1,350					
MI 2/	2,400					
MN 2/	6,700					
MO 2/	2,100					
NE	7,700	26	1.00	1.07	1.07	2,142
NY 2/	1,210					
NC	1,200	15	1.00	1.28	1.28	230
ND 2/	850					
OH	3,700	8	1.00	1.18	1.18	349
PA 2/	1,380					
SC	390	15	1.00	1.17	1.17	68
SD 2/	3,400					
TN 2/	620					
VA 2/	530					
WV 2/	90					
WI	3,700	19	1.00	1.02	1.02	717
REG 1	2/ 965					
REG 2	2,035	14	1.00	1.05	1.05	299
REG 3	2/ 1,245					
REG 4	2/ 1,056					
Total	74,171	12.3	1.00	1.12	1.12	10,232

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.
Reg 1: AZ, CA, ID, MT, NM, OR, UT, WA, WY.
Reg 2: AR, LA, OK, TX.
Reg 3: AL, FL, GA, MS.
Reg 4: CT, DE, MA, MD, ME, NH, NJ, RI, VT.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey
National Agricultural Statistics Service, USDA.

Corn: Frequency and Extent of Pesticide Usage
by Active Ingredient,
Major States and Regions, 1990

Active Ingredient	Area Applied 1/	Appli-cations	Rate per Application	Rate per Crop Year	Total Applied
	Percent	Number	Pounds	Pounds	1,000 Pounds
2,4-D	11.7	1.04	0.44	0.46	4,022
Alachlor	24.6	1.02	1.93	1.97	35,995
Ametryn	*				
Atrazine	64.3	1.08	1.13	1.22	58,125
Bentazon	1.2	1.00	0.59	0.59	521
Bifenthrin	*				
Bromoxynil	5.8	1.02	0.26	0.27	1,155
Bt (Bacillus thur.)	*				
Butylate	4.8	1.01	3.94	3.98	14,181
Carbaryl	*				
Carbofuran	3.1	1.05	1.09	1.14	2,612
Chloramben	*				
Chlorpyrifos	6.1	1.03	1.21	1.25	5,642
Cyanazine	17.9	1.02	1.73	1.76	23,375
Diallate	*				
Diazinon	*				
Dicamba	17.9	1.02	0.33	0.34	4,478
Dimethoate	*				
Disulfoton	*				
EPTC	9.3	1.00	4.43	4.43	30,581
Esfenvalerate	*				
Ethoprop	*				
Ethyl parathion	*				
Flucythrinate	*				
Fonofos	3.6	1.00	1.06	1.06	2,823
Glyphosate	1.6	1.00	1.02	1.02	1,215
Linuron	*				
Malathion	*				
Methomyl	*				
Methyl parathion	*				
Metolachlor	25.9	1.01	1.85	1.87	35,938
Metribuzin	*				
Oxydemeton-methyl	*				
Oxyfluorfen	*				

Continued on Page 27.

Corn: Frequency and Extent of Pesticide Usage
by Active Ingredient,
Major States and Regions, 1990 **(Continued)**

Active Ingredient	Area Applied 1/	Appli-cations	Rate per Application	Rate per Crop Year	Total Applied
	Percent	**Number**	**Pounds**	**Pounds**	**1,000 Pounds**
Paraquat	1.3	1.02	0.34	0.35	333
Pendimethalin	4.1	1.00	1.18	1.18	3,575
Permethrin	1.4	1.02	0.14	0.14	149
Phorate	2.2	1.00	1.06	1.06	1,725
Primisulfuron	*				
Propachlor	1.4	1.00	1.93	1.93	2,007
Propargite	*				
Simazine	1.7	1.04	1.49	1.55	1,952
Tefluthrin	1.6	1.00	0.12	0.12	138
Terbufos	12.3	1.00	1.12	1.12	10,232
Tridiphane	*				
Trifluralin	*				
Trimethacarb	*				
Vernolate	*				

* Applied on less than one percent of acres.
1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.

Source: Agricultural Chemical Usage Survey, National Agricultural Statistics Service, USDA.

Corn: Frequency and Extent of Pesticide Usage
by Active Ingredient,
Indiana, 1990

Active Ingredient	Area Applied 1/	Appli-cations	Rate per Application	Rate per Crop Year	Total Applied
	Percent	Number	Pounds	Pounds	1,000 Pounds
2,4-D	10	1.18	0.40	0.47	263
Alachlor	43	1.02	2.07	2.11	5,081
Atrazine	87	1.07	1.21	1.30	6,334
Bentazon	*				
Bromoxynil	*				
Butylate	10	1.00	4.35	4.35	2,436
Carbofuran	*				
Chlorpyrifos	5	1.00	1.32	1.32	370
Cyanazine	18	1.04	1.82	1.89	1,905
Dicamba	14	1.00	0.34	0.34	267
Dimethoate	*				
Disulfoton	*				
EPTC	*				
Fonofos	6	1.00	1.10	1.10	370
Glyphosate	*				
Metolachlor	23	1.00	1.75	1.75	2,254
Paraquat	2	1.00	0.34	0.34	38
Pendimethalin	*				
Permethrin	2	1.00	0.11	0.11	12
Phorate	2	1.00	1.16	1.16	130
Simazine	*				
Tefluthrin	4	1.00	0.12	0.12	27
Terbufos	15	1.00	1.14	1.14	958
Tridiphane	*				
Trifluralin	*				

* Applied on less than one percent of acres.
1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient. Area planted in 1990 was 5.6 million acres.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Corn: Frequency and Extent of Pesticide Usage
by Active Ingredient,
Iowa, 1990

Active Ingredient	Area Applied 1/	Applications	Rate per Application	Rate per Crop Year	Total Applied
	Percent	Number	Pounds	Pounds	1,000 Pounds
2,4-D	15	1.00	0.43	0.43	826
Alachlor	22	1.04	2.12	2.20	6,195
Atrazine	58	1.05	0.89	0.93	6,904
Bentazon	3	1.00	0.47	0.47	180
Bromoxynil	18	1.03	0.26	0.27	622
Butylate	*				
Carbofuran	*				
Chlorpyrifos	7	1.00	1.14	1.14	1,021
Cyanazine	18	1.03	1.92	1.98	4,562
Dicamba	21	1.01	0.31	0.31	833
Disulfoton	*				
EPTC	14	1.00	4.39	4.39	7,867
Fonofos	4	1.00	0.83	0.83	425
Glyphosate	*				
Malathion	*				
Metolachlor	35	1.01	2.14	2.16	9,677
Metribuzin	*				
Pendimethalin	3	1.00	1.33	1.33	511
Permethrin	*				
Phorate	3	1.00	1.19	1.19	457
Primisulfuron	*				
Propachlor	3	1.00	1.91	1.91	733
Tefluthrin	*				
Terbufos	16	1.00	1.11	1.11	2,273
Tridiphane	2	1.00	0.61	0.61	156
Trifluralin	*				
Trimethacarb	*				

* Applied on less than one percent of acres.
1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient. Area planted in 1990 was 12.8 million acres.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey
National Agricultural Statistics Service, USDA.

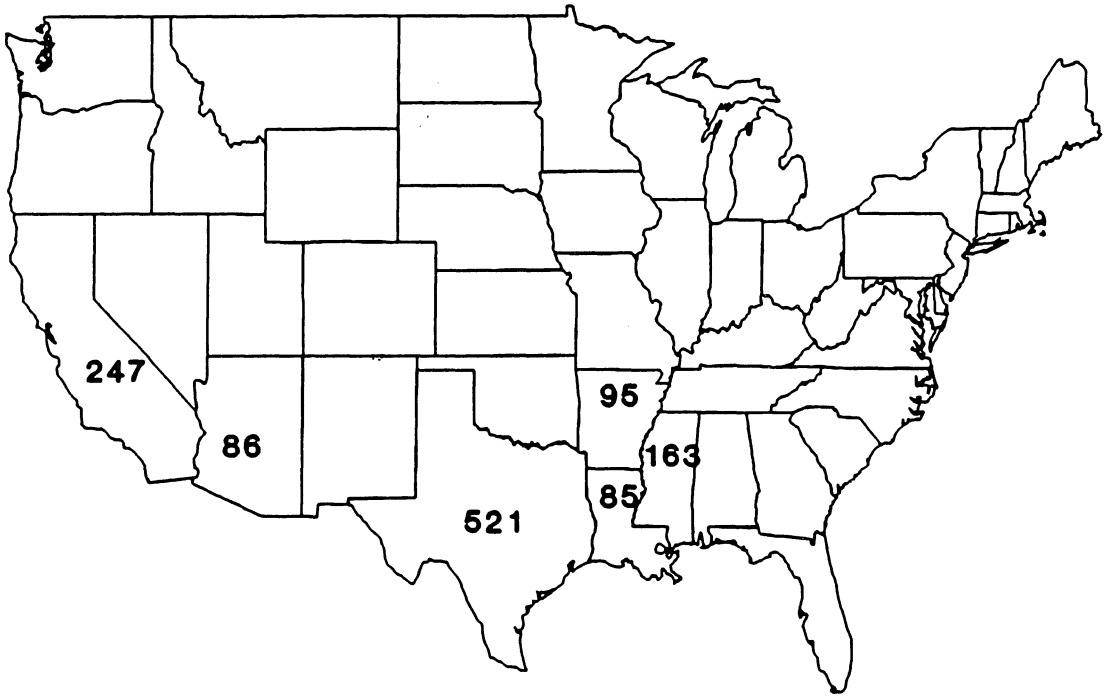
Upland Cotton

Nitrogen was applied to over 93 percent of the upland cotton acres in five of the six States surveyed. Texas was the exception, where two thirds of the acreage was treated. All States averaged less than two treatments per acre, except in Arizona where 2.5 treatments were made. Rates per application of nitrogen were lowest in Arkansas and highest in California. Phosphate use varied by State. In California, phosphate was applied on only 27 percent of the acres, while in Arkansas 83 percent of the acreage received phosphate. Potash use was widespread throughout the Delta States **(AR, LA, MS)** compared to the west **(AZ, CA, TX)**.

Herbicide use was prevalent in all six States. Acres treated with herbicides ranged from a high of 100 percent in Mississippi to a low of 88 percent in California. Average number of treatments was higher in the Delta States than the West. Fluometuron use was confined almost exclusively to the Delta States, indicating varying weed problems between regions.

Information on 21 different herbicides was collected in the survey. Information on usage of insecticides, defoliants, desiccants, and other types of chemicals were not asked as part of the cotton survey. The number of usable reports and States in the 1990 survey are shown in the U.S. map below. These States represent 9.83 million acres of upland cotton, 81 percent of the total upland acres planted in the U.S. in 1990.

Upland Cotton: Number of Usable Reports, 1990



Fertilizer Applications of Primary Plant Nutrients,
Major States, 1990

State	Area Planted	Area Receiving 1/ Nitrogen	Phosphate	Potash
	1,000 Acres	Percent		
AZ	350	93	44	7
AR	770	99	83	87
CA	1,070	94	27	3
LA	810	99	62	62
MS	1,225	99	42	56
TX	5,600	66	47	19
Total	9,825	79.2	48.5	30.6

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Upland Cotton: Frequency and Extent of Nitrogen Fertilizer Usage,
Major States, 1990

State	Area Planted	Area Applied 1/	Appli-cations	Rate per Application	Rate per Crop Year	Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	Million Pounds
AZ	350	93	2.50	60	149	48
AR	770	99	1.94	44	85	65
CA	1,070	94	1.76	81	142	143
LA	810	99	1.40	55	77	62
MS	1,225	99	1.78	61	109	132
TX	5,600	66	1.30	45	59	218
Total	9,825	79.2	1.56	55.0	85.8	668

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Upland Cotton: Frequency and Extent of Phosphate Fertilizer Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Rate per Application	Rate per Crop Year	Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	Million Pounds
AZ	350	44	1.32	51	67	10
AR	770	83	1.06	34	36	23
CA	1,070	27	1.03	66	68	20
LA	810	62	1.15	42	48	24
MS	1,225	42	1.01	50	50	26
TX	5,600	47	1.05	38	40	105
Total	9,825	48.5	1.07	40.8	43.7	208

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Upland Cotton: Frequency and Extent of Potash Fertilizer Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Rate per Application	Rate per Crop Year	Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	Million Pounds
AZ	350	7	1.67	13	21	1
AR	770	87	1.10	52	57	38
CA	1,070	3	1.00	40	40	1
LA	810	62	1.13	55	62	31
MS	1,225	56	1.02	76	78	54
TX	5,600	19	1.08	16	17	18
Total	9,825	30.6	1.08	44.1	47.6	143

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Upland Cotton: Total Acreage and Percentage of Acreage Receiving Herbicide Applications, Major States, 1990

State	Area Planted	Area Receiving Herbicides 1/
	1,000 Acres	Percent
AZ	350	93
AR	770	97
CA	1,070	88
LA	810	99
MS	1,225	100
TX	5,600	94
Total	9,825	94.6

1/ Refers to acres receiving one or more applications of a herbicide.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Upland Cotton: Frequency and Extent of Cyanazine Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AZ 2/	350					
AR	770	47	1.47	0.63	0.93	337
CA	1,070	16	1.00	1.19	1.19	204
LA	810	35	1.13	0.62	0.70	198
MS	1,225	56	1.43	0.50	0.71	487
TX 2/	5,600					
Total	9,825	15.7	1.33	0.62	0.82	1,265

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Upland Cotton: Frequency and Extent of Diuron Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AZ 2/	350					
AR 2/	770					
CA 2/	1,070					
LA	810	32	1.07	0.67	0.72	187
MS	1,225	25	1.02	0.69	0.70	214
TX 2/	5,600					
Total	9,825	8.3	1.04	0.67	0.70	572

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Upland Cotton: Frequency and Extent of DSMA Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AZ 2/	350					
AR	770	14	1.23	1.33	1.64	177
CA 2/	1,070					
LA	810	21	1.17	1.94	2.27	386
MS	1,225	15	1.00	1.71	1.71	314
TX 2/	5,600					
Total	9,825	4.9	1.11	1.64	1.82	877

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Upland Cotton: Frequency and Extent of Fluometuron Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AZ 2/	350					
AR	770	80	1.41	0.54	0.76	468
CA 2/	1,070					
LA	810	87	1.26	0.46	0.58	409
MS	1,225	92	1.44	0.59	0.85	958
TX 2/	5,600					
Total	9,825	26.1	1.36	0.54	0.73	1,878

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Upland Cotton: Frequency and Extent of Methazole Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AZ 2/	350					
AR	770	23	1.18	0.45	0.53	94
CA 2/	1,070					
LA	810	14	1.08	0.62	0.67	76
MS	1,225	12	1.05	0.57	0.60	88
TX 2/	5,600					
Total	9,825	4.8	1.11	0.56	0.62	293

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Upland Cotton: Frequency and Extent of MSMA Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AZ 2/	350					
AR	770	51	1.75	1.06	1.85	726
CA 2/	1,070					
LA	810	68	1.53	0.93	1.43	788
MS	1,225	67	1.57	0.89	1.40	1,149
TX 2/	5,600					
Total	9,825	18.4	1.58	0.94	1.49	2,689

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Upland Cotton: Frequency and Extent of Norflurazon Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AZ 2/	350					
AR	770	68	1.03	0.59	0.61	319
CA 2/	1,070					
LA	810	51	1.16	0.56	0.65	269
MS	1,225	68	1.16	0.49	0.57	475
TX 2/	5,600					
Total	9,825	19.1	1.12	0.53	0.59	1,110

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Upland Cotton: Frequency and Extent of Pendimethalin Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AZ	350	39	1.06	0.77	0.82	112
AR	770	26	1.04	0.63	0.66	132
CA	1,070	28	1.03	0.93	0.96	288
LA	810	16	1.00	0.73	0.73	95
MS	1,225	21	1.00	0.78	0.78	201
TX	5,600	15	1.11	0.72	0.80	672
Total	9,825	19.1	1.06	0.75	0.80	1,500

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Upland Cotton: Frequency and Extent of Prometryn Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AZ	350	53	1.29	0.82	1.06	197
AR	770	25	1.46	0.59	0.86	166
CA	1,070	13	1.06	1.01	1.07	149
LA	810	40	1.29	0.41	0.53	172
MS	1,225	39	1.10	0.50	0.55	263
TX	5,600	20	1.00	0.47	0.47	526
Total	9,825	24.7	1.12	0.54	0.61	1,473

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Upland Cotton: Frequency and Extent of Trifluralin Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AZ	350	45	1.14	0.59	0.67	106
AR	770	41	1.00	0.61	0.61	193
CA	1,070	49	1.00	0.72	0.72	377
LA	810	45	1.00	0.74	0.74	270
MS	1,225	58	1.01	0.60	0.61	433
TX	5,600	75	1.03	0.70	0.72	3,024
Total	9,825	63.7	1.03	0.68	0.70	4,403

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Upland Cotton: Frequency and Extent of Pesticide Usage
by Active Ingredient,
Major States, 1990

Active Ingredient	Area Applied 1/	Applications	Rate per Application	Rate per Crop Year	Total Applied
	Percent	Number	Pounds	Pounds	1,000 Pounds
Alachlor	*				
Cyanazine	15.7	1.33	0.62	0.82	1,265
DCPA	*				
Diuron	8.3	1.04	0.67	0.70	572
DSMA	4.9	1.11	1.64	1.82	877
EPTC	*				
Fluazifop-P-butyl	4.1	1.08	0.14	0.15	59
Fluometuron	26.1	1.36	0.54	0.73	1,878
Glyphosate	3.2	1.03	0.48	0.49	155
Lactofen	1.1	1.00	0.09	0.09	10
Linuron	*				
Methazole	4.8	1.11	0.56	0.62	293
Metolachlor	3.4	1.00	0.93	0.93	311
MSMA	18.4	1.58	0.94	1.49	2,689
Norflurazon	19.1	1.12	0.53	0.59	1,110
Oxyfluorfen	1.1	1.67	0.17	0.28	30
Paraquat	*				
Pendimethalin	19.1	1.06	0.75	0.80	1,500
Prometryn	24.7	1.12	0.54	0.61	1,473
Sethoxydim	1.6	1.09	0.28	0.31	48
Trifluralin	63.7	1.03	0.68	0.70	4,403

* Applied on less than one percent of acres.
1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.

Source: Agricultural Chemical Usage Survey, National Agricultural Statistics Service, USDA.

Fall Season Potatoes

Nitrogen was applied to over 92 percent of the fall season potato acres in the 10 of the 11 States surveyed. In New York, 78 percent of the acreage was treated. Producers in the surveyed States made multiple applications of nitrogen. Rates per application and per crop year were lowest in North Dakota and highest in Washington.

Phosphate use was also widespread. The percent of acres treated was above 92 percent in all States except New York, where 78 percent of the acreage was treated. The lowest application rates were reported in North Dakota and the highest rates in Washington.

Potash was applied in all 11 States. North Dakota had the lowest rate per crop year while Wisconsin had the highest rate.

Herbicide use was prevalent in all States except North Dakota, where only 27 percent of the acres received a herbicide treatment.

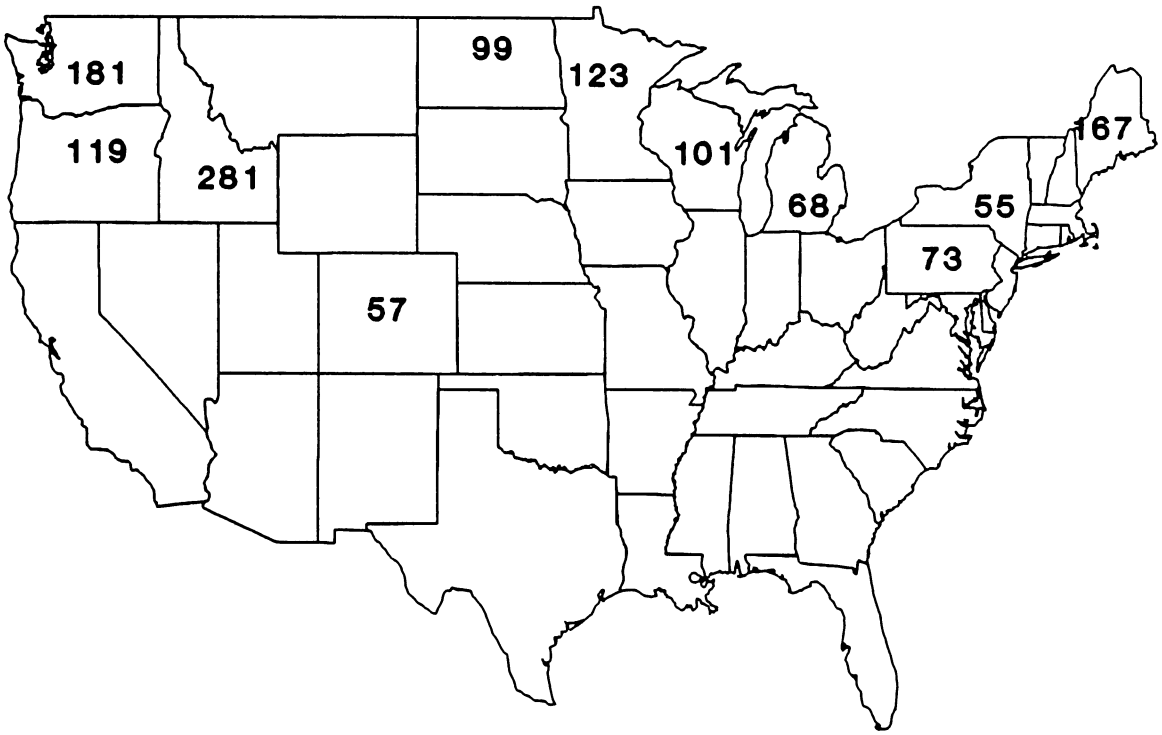
Insecticide use was lowest in Colorado where 65 percent of the acreage was treated. Generally, most other States had more than 80 percent of acreage treated with insecticides. Number of treatments, rates per application, and rates over the entire crop year varied greatly between States.

Acres treated with fungicides ranged from 39 percent in Idaho to 99 percent treated in Maine.

Vine killers were used extensively in Maine with 94 percent of the acreage treated compared with other States surveyed. Growth regulators were also applied to 26 percent of the acreage in Maine. Other States reported use of growth regulators, but data were not published due to an insufficient number of reports.

Information on 11 different herbicides, 31 insecticides, 14 fungicides, 5 vine killers, and 1 growth regulator were collected in the survey. Other types of chemicals were not asked as part of the fall season potato survey. The number of usable reports and States in the 1990 survey are shown in the U.S. map below. These States represent 1.10 million acres of fall season potatoes, 94 percent of the total fall planted acres.

Fall Potatoes: Number of Usable Reports, 1990



Fall Potatoes: Total Acreage and Percentage of Acreage Receiving Fertilizer Applications of Primary Plant Nutrients, Major States, 1990

State	Area Planted	Area Receiving 1/ Nitrogen	Phosphate	Potash
	1,000 Acres	Percent		
CO	65.5	100	100	95
ID	395.0	100	99	82
ME	81.0	98	100	100
MI	34.0	96	96	99
MN	69.0	92	92	89
NY	29.0	78	78	78
ND	150.0	97	96	93
OR	53.0	99	97	78
PA	23.0	100	95	97
WA	133.0	100	97	97
WI	67.0	100	95	95
Total	1,099.5	98.0	96.9	89.1

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Frequency and Extent of Nitrogen Fertilizer Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Appli-cations	Rate per Application	Rate per Crop Year	Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	Million Pounds
CO	65.5	100	2.48	88	219	14
ID	395.0	100	2.35	95	223	88
ME	81.0	98	1.12	141	158	13
MI	34.0	96	2.23	70	156	5
MN	69.0	92	1.47	69	102	6
NY	29.0	78	1.51	97	147	3
ND	150.0	97	2.11	40	84	12
OR	53.0	99	2.21	123	271	14
PA	23.0	100	1.42	104	148	3
WA	133.0	100	1.64	176	289	38
WI	67.0	100	2.57	79	203	14
Total	1,099.5	98.0	2.06	94.6	194.9	210

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Frequency and Extent of Phosphate Fertilizer Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Rate per Application	Rate per Crop Year	Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	Million Pounds
CO	65.5	100	1.55	122	189	12
ID	395.0	99	1.62	105	170	66
ME	81.0	100	1.04	164	171	14
MI	34.0	96	1.38	104	144	5
MN	69.0	92	1.12	75	84	5
NY	29.0	78	1.00	172	172	4
ND	150.0	96	1.25	63	79	11
OR	53.0	97	1.72	112	192	10
PA	23.0	95	1.10	132	145	3
WA	133.0	97	1.32	178	235	30
WI	67.0	95	1.19	132	157	10
Total	1,099.5	96.9	1.40	114.0	159.6	170

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Frequency and Extent of Potash Fertilizer Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Rate per Application	Rate per Crop Year	Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	Million Pounds
CO	65.5	95	1.55	52	80	5
ID	395.0	82	1.30	75	98	32
ME	81.0	100	1.08	160	173	14
MI	34.0	99	1.88	116	218	7
MN	69.0	89	1.32	123	163	10
NY	29.0	78	1.18	175	206	5
ND	150.0	93	1.26	48	61	9
OR	53.0	78	1.46	111	162	7
PA	23.0	97	1.13	120	136	3
WA	133.0	97	1.23	180	222	29
WI	67.0	95	1.80	171	308	20
Total	1,099.5	89.1	1.34	107.4	143.9	141

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Total Acreage and Percentage of Acreage Receiving Herbicide Applications, Major States, 1990

State	Area Planted	Area Receiving Herbicides 1/
	1,000 Acres	Percent
CO	65.5	74
ID	395.0	93
ME	81.0	97
MI	34.0	90
MN	69.0	55
NY	29.0	72
ND	150.0	27
OR	53.0	79
PA	23.0	83
WA	133.0	93
WI	67.0	92
Total	1,099.5	79.2

1/ Refers to acres receiving one or more applications of a herbicide.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Total Acreage and Percentage of Acreage Receiving Insecticide Applications, Major States, 1990

State	Area Planted	Area Receiving Insecticides 1/
	1,000 Acres	Percent
CO	65.5	65
ID	395.0	80
ME	81.0	99
MI	34.0	92
MN	69.0	94
NY	29.0	78
ND	150.0	97
OR	53.0	94
PA	23.0	98
WA	133.0	95
WI	67.0	99
Total	1,099.5	88.2

1/ Refers to acres receiving one or more applications of an insecticide.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Total Acreage and Percentage of Acreage Receiving Fungicide Applications, Major States, 1990

State	Area Planted	Area Receiving Fungicides 1/
	1,000 Acres	Percent
CO	65.5	98
ID	395.0	39
ME	81.0	99
MI	34.0	87
MN	69.0	82
NY	29.0	76
ND	150.0	72
OR	53.0	80
PA	23.0	95
WA	133.0	74
WI	67.0	95
Total	1,099.5	67.1

1/ Refers to acres receiving one or more applications of a fungicide.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Total Acreage and Percentage of Acreage Receiving Vine Killers Applications, Major States, 1990

State	Area Planted	Area Receiving Vine Killers 1/
	1,000 Acres	Percent
CO	65.5	68
ID	395.0	19
ME	81.0	94
MI	34.0	62
MN	69.0	55
NY	29.0	51
ND 2/	150.0	
OR	53.0	17
PA	23.0	54
WA	133.0	23
WI	67.0	49
Total	1,099.5	32.9

1/ Refers to acres receiving one or more applications of a vine killer.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Total Acreage and Percentage of Acreage Receiving Growth Regulator Applications, Major States, 1990

State	Area Planted	Area Receiving Growth Regulators 1/
	1,000 Acres	Percent
CO 2/	65.5	
ID 2/	395.0	
ME	81.0	26
MI 2/	34.0	
MN 2/	69.0	
NY 2/	29.0	
ND 2/	150.0	
OR 2/	53.0	
PA 2/	23.0	
WA 2/	133.0	
WI 2/	67.0	
Total	1,099.5	4.2

1/ Refers to acres receiving one or more applications of a growth regulator.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Frequency and Extent of Azinphos-methyl Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO 2/	65.5					
ID 2/	395.0					
ME	81.0	46	1.60	0.36	0.58	22
MI	34.0	27	1.25	0.35	0.44	4
MN 2/	69.0					
NY 2/	29.0					
ND 2/	150.0					
OR 2/	53.0					
PA	23.0	48	1.65	0.53	0.88	10
WA 2/	133.0					
WI 2/	67.0					
Total	1,099.5	5.9	1.53	0.39	0.60	39

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Frequency and Extent of Carbaryl Usage,
Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO 2/	65.5					
ID 2/	395.0					
ME 2/	81.0					
MI	34.0	28	1.12	1.24	1.39	13
MN 2/	69.0					
NY 2/	29.0					
ND 2/	150.0					
OR 2/	53.0					
PA 2/	23.0					
WA 2/	133.0					
WI 2/	67.0					
Total	1,099.5	2.4	1.18	0.97	1.14	30

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Frequency and Extent of Carbofuran Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO 2/	65.5					
ID 2/	395.0					
ME 2/	81.0					
MI	34.0	22	1.31	0.66	0.86	6
MN	69.0	42	1.35	0.71	0.96	28
NY 2/	29.0					
ND	150.0	63	1.42	0.47	0.67	63
OR 2/	53.0					
PA 2/	23.0					
WA 2/	133.0					
WI 2/	67.0					
Total	1,099.5	13.6	1.36	0.72	0.98	146

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Frequency and Extent of Copper hydroxide Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO	65.5	32	1.00	1.21	1.21	25
ID 2/	395.0					
ME 2/	81.0					
MI	34.0	20	1.00	1.61	1.61	11
MN 2/	69.0					
NY 2/	29.0					
ND 2/	150.0					
OR	53.0	30	1.11	1.06	1.18	19
PA 2/	23.0					
WA	133.0	5	1.22	1.53	1.87	12
WI 2/	67.0					
Total	1,099.5	5.9	1.07	1.34	1.43	93

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Frequency and Extent of Disulfoton Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO 2/	65.5					
ID 2/	395.0					
ME	81.0	16	1.00	2.15	2.15	28
MI 2/	34.0					
MN 2/	69.0					
NY 2/	29.0					
ND 2/	150.0					
OR	53.0	18	1.12	2.91	3.26	31
PA 2/	23.0					
WA	133.0	30	1.50	2.89	4.33	173
WI	67.0	14	1.00	2.93	2.93	27
Total	1,099.5	8.2	1.23	2.70	3.32	299

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Frequency and Extent of Diquat Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO	65.5	26	1.00	0.25	0.25	4
ID	395.0	4	1.00	0.50	0.50	8
ME	81.0	91	1.72	0.26	0.45	33
MI	34.0	62	1.05	0.33	0.35	7
MN	69.0	52	1.13	0.26	0.29	10
NY	29.0	46	1.15	0.34	0.39	5
ND 2/	150.0					
OR	53.0	16	1.06	0.28	0.30	3
PA	23.0	48	1.06	0.30	0.32	4
WA	133.0	19	1.03	0.30	0.31	8
WI	67.0	44	1.29	0.26	0.34	10
Total	1,099.5	23.4	1.28	0.28	0.36	93

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Frequency and Extent of Endosulfan Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO 2/	65.5					
ID 2/	395.0					
ME	81.0	49	1.47	0.61	0.90	36
MI	34.0	30	1.50	0.83	1.24	13
MN 2/	69.0					
NY	29.0	30	1.12	0.77	0.86	7
ND 2/	150.0					
OR 2/	53.0					
PA	23.0	45	1.66	0.78	1.29	13
WA	133.0	8	1.00	0.78	0.78	8
WI	67.0	24	1.48	0.60	0.89	14
Total	1,099.5	10.2	1.35	0.67	0.90	101

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.

2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Frequency and Extent of EPTC Usage,
Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO	65.5	53	1.00	3.12	3.12	108
ID	395.0	47	1.03	3.20	3.30	613
ME 2/	81.0					
MI 2/	34.0					
MN 2/	69.0					
NY 2/	29.0					
ND 2/	150.0					
OR	53.0	51	1.01	3.28	3.31	89
PA 2/	23.0					
WA	133.0	36	1.02	3.88	3.96	190
WI 2/	67.0					
Total	1,099.5	28.5	1.02	3.35	3.42	1,073

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Frequency and Extent of Esfenvalerate Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO	65.5	54	1.03	0.03	0.03	1
ID	395.0	15	1.01	0.03	0.03	2
ME	81.0	30	1.49	0.03	0.05	1
MI	34.0	22	1.31	0.03	0.04	3/
MN	69.0	30	1.37	0.04	0.05	1
NY	29.0	35	1.35	0.04	0.06	1
ND	150.0	14	1.14	0.04	0.05	1
OR 2/	53.0					
PA	23.0	32	1.19	0.06	0.07	1
WA 2/	133.0					
WI	67.0	41	1.25	0.08	0.10	3
Total	1,099.5	20.0	1.18	0.04	0.05	11

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.
3/ Less than 500 pounds.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Frequency and Extent of Ethoprop Usage,
Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO 2/	65.5					
ID	395.0	24	1.01	4.97	5.02	476
ME 2/	81.0					
MI 2/	34.0					
MN 2/	69.0					
NY 2/	29.0					
ND 2/	150.0					
OR	53.0	12	1.13	5.28	5.97	38
PA 2/	23.0					
WA	133.0	13	1.13	6.70	7.57	131
WI 2/	67.0					
Total	1,099.5	11.5	1.04	5.04	5.24	663

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Frequency and Extent of Ethyl parathion Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO 2/	65.5					
ID 2/	395.0					
ME 2/	81.0					
MI	34.0	28	1.71	0.55	0.94	9
MN 2/	69.0					
NY	29.0	23	1.54	0.60	0.92	6
ND 2/	150.0					
OR 2/	53.0					
PA 2/	23.0					
WA 2/	133.0					
WI 2/	67.0					
Total	1,099.5	1.8	1.62	0.59	0.96	19

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Frequency and Extent of Fonofos Usage,
Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO 2/	65.5					
ID 2/	395.0					
ME 2/	81.0					
MI 2/	34.0					
MN 2/	69.0					
NY 2/	29.0					
ND 2/	150.0					
OR	53.0	11	1.00	2.10	2.10	12
PA 2/	23.0					
WA	133.0	7	1.00	1.79	1.79	17
WI 2/	67.0					
Total	1,099.5	1.8	1.00	2.37	2.37	47

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Frequency and Extent of Iprodione Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO 2/	65.5					
ID 2/	395.0					
ME 2/	81.0					
MI 2/	34.0					
MN 2/	69.0					
NY 2/	29.0					
ND 2/	150.0					
OR	53.0	23	1.09	0.92	1.00	12
PA 2/	23.0					
WA	133.0	43	1.01	0.68	0.69	39
WI 2/	67.0					
Total	1,099.5	7.0	1.02	0.75	0.77	59

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Frequency and Extent of Linuron Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO 2/	65.5					
ID 2/	395.0					
ME	81.0	28	1.02	0.64	0.65	15
MI	34.0	38	1.00	0.87	0.87	11
MN 2/	69.0					
NY	29.0	28	1.00	1.36	1.36	11
ND 2/	150.0					
OR 2/	53.0					
PA	23.0	18	1.00	0.76	0.76	3
WA 2/	133.0					
WI	67.0	21	1.00	0.75	0.75	11
Total	1,099.5	6.4	1.01	0.81	0.82	58

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Frequency and Extent of Maleic hydrazide Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO 2/	65.5					
ID 2/	395.0					
ME	81.0	26	1.22	2.30	2.80	59
MI 2/	34.0					
MN 2/	69.0					
NY 2/	29.0					
ND 2/	150.0					
OR 2/	53.0					
PA 2/	23.0					
WA 2/	133.0					
WI 2/	67.0					
Total	1,099.5	4.2	1.10	2.13	2.34	108

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Frequency and Extent of Mancozeb Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO 2/	65.5					
ID	395.0	6	1.00	0.95	0.95	23
ME	81.0	68	6.29	0.86	5.44	300
MI	34.0	67	2.58	1.14	2.95	67
MN	69.0	47	2.55	1.33	3.38	110
NY	29.0	53	2.67	1.01	2.70	41
ND	150.0	25	1.56	1.36	2.12	80
OR	53.0	16	1.68	0.99	1.67	14
PA	23.0	85	5.09	1.24	6.33	124
WA	133.0	16	1.11	1.09	1.21	26
WI	67.0	75	4.20	1.31	5.49	276
Total	1,099.5	26.1	3.34	1.11	3.70	1,063

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Frequency and Extent of Maneb Usage,
Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO 2/	65.5					
ID	395.0	6	1.38	1.21	1.67	40
ME	81.0	42	7.92	0.88	7.00	238
MI	34.0	17	2.50	1.48	3.71	21
MN	69.0	30	1.26	1.07	1.35	28
NY	29.0	19	2.82	1.09	3.07	17
ND	150.0	41	1.51	1.07	1.61	99
OR	53.0	21	1.00	1.49	1.49	17
PA 2/	23.0					
WA	133.0	9	1.13	1.11	1.25	15
WI	67.0	18	2.69	1.16	3.11	38
Total	1,099.5	17.5	2.73	1.00	2.74	528

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Frequency and Extent of Metalaxyl Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO 2/	65.5					
ID 2/	395.0					
ME	81.0	43	1.93	0.13	0.26	9
MI	34.0	20	1.33	0.14	0.19	1
MN 2/	69.0					
NY	29.0	49	1.79	0.16	0.28	4
ND 2/	150.0					
OR	53.0	12	1.45	0.19	0.27	2
PA	23.0	58	2.37	0.17	0.40	5
WA	133.0	7	1.00	0.15	0.15	1
WI 2/	67.0					
Total	1,099.5	8.3	1.75	0.14	0.25	23

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Frequency and Extent of Metam-sodium Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO 2/	65.5					
ID 2/	395.0					
ME 2/	81.0					
MI 2/	34.0					
MN 2/	69.0					
NY 2/	29.0					
ND 2/	150.0					
OR	53.0	28	1.00	49.18	49.18	730
PA 2/	23.0					
WA 2/	133.0					
WI 2/	67.0					
Total	1,099.5	2.0	1.00	52.71	52.71	1,159

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Frequency and Extent of Metiram Usage,
Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO 2/	65.5					
ID 2/	395.0					
ME 2/	81.0					
MI 2/	34.0					
MN 2/	69.0					
NY	29.0	18	3.60	1.24	4.48	23
ND	150.0	11	2.00	0.59	1.18	19
OR 2/	53.0					
PA 2/	23.0					
WA 2/	133.0					
WI 2/	67.0					
Total	1,099.5	3.0	2.08	0.90	1.88	62

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Frequency and Extent of Methamidophos Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO 2/	65.5					
ID	395.0	3	1.10	0.66	0.73	9
ME	81.0	52	1.64	0.70	1.15	48
MI	34.0	28	1.24	0.78	0.97	9
MN 2/	69.0					
NY	29.0	26	1.53	0.87	1.33	10
ND 2/	150.0					
OR	53.0	54	1.53	0.91	1.39	40
PA	23.0	37	1.17	0.83	0.97	8
WA	133.0	65	1.20	0.81	0.97	84
WI 2/	67.0					
Total	1,099.5	19.5	1.33	0.80	1.06	227

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Frequency and Extent of Metolachlor Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO 2/	65.5					
ID 2/	395.0					
ME 2/	81.0					
MI	34.0	37	1.00	1.88	1.88	24
MN	69.0	15	1.00	2.02	2.02	21
NY	29.0	35	1.00	1.99	1.99	20
ND 2/	150.0					
OR 2/	53.0					
PA	23.0	62	1.03	1.81	1.86	27
WA 2/	133.0					
WI	67.0	22	1.00	1.85	1.85	27
Total	1,099.5	7.9	1.00	1.83	1.83	159

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Frequency and Extent of Metribuzin Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO	65.5	60	1.00	0.31	0.31	12
ID	395.0	86	1.01	0.57	0.58	197
ME	81.0	69	1.01	0.49	0.49	27
MI	34.0	60	1.06	0.41	0.43	9
MN	69.0	18	1.25	0.59	0.74	9
NY	29.0	30	1.12	0.55	0.62	5
ND	150.0	8	1.13	0.50	0.56	7
OR	53.0	57	1.04	0.49	0.51	15
PA	23.0	68	1.00	0.62	0.62	10
WA	133.0	72	1.01	0.47	0.47	45
WI	67.0	74	1.06	0.50	0.53	26
Total	1,099.5	61.9	1.02	0.52	0.53	362

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Frequency and Extent of Oxamyl Usage,
Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO 2/	65.5					
ID 2/	395.0					
ME	81.0	6	1.20	0.44	0.53	3
MI 2/	34.0					
MN 2/	69.0					
NY	29.0	14	1.13	0.47	0.53	2
ND 2/	150.0					
OR 2/	53.0					
PA	23.0	12	1.25	0.65	0.81	2
WA	133.0	7	1.00	0.75	0.75	7
WI 2/	67.0					
Total	1,099.5	2.1	1.10	0.55	0.61	14

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Frequency and Extent of Pendimethalin Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO 2/	65.5					
ID	395.0	17	1.00	0.89	0.89	60
ME 2/	81.0					
MI 2/	34.0					
MN	69.0	11	1.00	1.03	1.03	8
NY 2/	29.0					
ND	150.0	10	1.00	1.06	1.06	16
OR	53.0	20	1.05	0.72	0.76	8
PA 2/	23.0					
WA	133.0	17	1.17	1.08	1.26	28
WI	67.0	16	1.00	0.85	0.85	9
Total	1,099.5	12.6	1.03	0.94	0.97	135

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Frequency and Extent of Permethrin Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO 2/	65.5					
ID	395.0	6	1.06	0.11	0.12	3
ME	81.0	24	1.22	0.15	0.18	3
MI 2/	34.0					
MN 2/	69.0					
NY	29.0	16	1.11	0.14	0.15	1
ND 2/	150.0					
OR	53.0	15	1.14	0.13	0.15	1
PA	23.0	32	2.48	0.16	0.40	3
WA	133.0	17	1.21	0.08	0.10	2
WI	67.0	32	1.14	0.12	0.14	3
Total	1,099.5	10.5	1.22	0.11	0.14	16

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Frequency and Extent of Phorate Usage,
Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO 2/	65.5					
ID	395.0	43	1.00	3.18	3.18	540
ME 2/	81.0					
MI	34.0	43	1.00	2.83	2.83	41
MN	69.0	22	1.00	2.43	2.43	37
NY 2/	29.0					
ND	150.0	36	1.00	2.74	2.74	148
OR	53.0	31	1.00	2.83	2.83	46
PA	23.0	54	1.00	2.93	2.93	36
WA	133.0	24	1.00	2.86	2.86	91
WI	67.0	24	1.05	2.57	2.70	43
Total	1,099.5	30.5	1.00	2.96	2.96	991

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Frequency and Extent of Phosphamidon Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO 2/	65.5					
ID 2/	395.0					
ME 2/	81.0					
MI 2/	34.0					
MN	69.0	34	1.24	0.49	0.61	14
NY 2/	29.0					
ND	150.0	39	1.31	0.50	0.66	39
OR 2/	53.0					
PA 2/	23.0					
WA	133.0	13	1.05	0.52	0.55	10
WI 2/	67.0					
Total	1,099.5	9.0	1.25	0.51	0.64	63

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Frequency and Extent of Propargite Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO 2/	65.5					
ID 2/	395.0					
ME 2/	81.0					
MI 2/	34.0					
MN 2/	69.0					
NY 2/	29.0					
ND 2/	150.0					
OR	53.0	5	1.00	1.45	1.45	4
PA 2/	23.0					
WA	133.0	6	1.00	1.52	1.52	12
WI 2/	67.0					
Total	1,099.5	1.0	1.00	1.46	1.46	16

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Frequency and Extent of Sulfuric acid Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO	65.5	42	1.00	281.93	281.93	7,756
ID	395.0	15	1.00	285.39	285.39	16,931
ME 2/	81.0					
MI 2/	34.0					
MN 2/	69.0					
NY 2/	29.0					
ND 2/	150.0					
OR 2/	53.0					
PA 2/	23.0					
WA 2/	133.0					
WI 2/	67.0					
Total	1,099.5	8.4	1.00	277.78	277.78	25,655

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Frequency and Extent of Trifluralin Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO 2/	65.5					
ID	395.0	6	1.00	0.70	0.70	17
ME 2/	81.0					
MI 2/	34.0					
MN	69.0	8	1.00	0.58	0.58	3
NY 2/	29.0					
ND	150.0	8	1.00	0.76	0.76	9
OR	53.0	11	1.00	0.70	0.70	4
PA 2/	23.0					
WA	133.0	7	1.00	0.77	0.77	7
WI 2/	67.0					
Total	1,099.5	5.3	1.00	0.69	0.69	40

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Frequency and Extent of Triphenyltin hydroxide Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
CO	65.5	32	1.83	0.20	0.36	8
ID 2/	395.0					
ME 2/	81.0					
MI 2/	34.0					
MN	69.0	9	2.25	0.16	0.35	2
NY 2/	29.0					
ND	150.0	19	1.11	0.22	0.24	7
OR 2/	53.0					
PA 2/	23.0					
WA 2/	133.0					
WI	67.0	24	2.24	0.18	0.41	7
Total	1,099.5	7.3	1.61	0.21	0.34	27

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Fall Potatoes: Frequency and Extent of Pesticide Usage
by Active Ingredient,
Major States, 1990

Active Ingredient	Area Applied 1/	Applications	Rate per Application	Rate per Crop Year	Total Applied
	Percent	Number	Pounds	Pounds	1,000 Pounds
Aldicarb	1.6	1.00	2.44	2.44	43
Ametryn	*				
Anilazine	1.0	1.44	1.14	1.64	18
Azinphos-methyl	5.9	1.53	0.39	0.60	39
Basic copper sulfat	*				
Bt (Bacillus thur.)	*				
Carbaryl	2.4	1.18	0.97	1.14	30
Carbofuran	13.6	1.36	0.72	0.98	146
Chlorothalonil	22.5	1.70	0.89	1.52	375
Copper hydroxide	5.9	1.07	1.34	1.43	93
Cryolite	*				
DCNA	*				
DCPA	*				
Diallate	0.1	1.00	0.91	0.91	1
Diazinon	1.8	1.06	0.91	0.96	19
Dichloropropene	1.3	1.00	21.90	21.90	313
Dimethoate	1.3	1.43	0.34	0.49	7
Diquat	23.4	1.28	0.28	0.36	93
Disulfoton	8.2	1.23	2.70	3.32	299
Endosulfan	10.2	1.35	0.67	0.90	101
Endothall	1.5	1.11	0.77	0.85	14
EPTC	28.5	1.02	3.35	3.42	1,073
Esfenvalerate	20.0	1.18	0.04	0.05	11
Ethoprop	11.5	1.04	5.04	5.24	663
Ethyl parathion	1.8	1.62	0.59	0.96	19
Fensulfothion	*				
Fonofos	1.8	1.00	2.37	2.37	47
Glyphosate	1.7	1.03	1.15	1.18	22
Iprodione	7.0	1.02	0.75	0.77	59
Linuron	6.4	1.01	0.81	0.82	58
Malathion	*				
Maleic hydrazide	4.2	1.10	2.13	2.34	108
Mancozeb	26.1	3.34	1.11	3.70	1,063
Maneb	17.5	2.73	1.00	2.74	528
Metalaxyl	8.3	1.75	0.14	0.25	23
Metam-sodium	2.0	1.00	52.71	52.71	1,159
Methamidophos	19.5	1.33	0.80	1.06	227
Methomyl	*				
Methoxychlor	*				

Continued on Page 84.

Fall Potatoes: Frequency and Extent of Pesticide Usage
by Active Ingredient,
Major States, 1990 **(Continued)**

Active Ingredient	Area Applied 1/	Applications	Rate per Application	Rate per Crop Year	Total Applied
	Percent	**Number**	**Pounds**	**Pounds**	**1,000 Pounds**
Methyl parathion	*				
Metiram	3.0	2.08	0.90	1.88	62
Metolachlor	7.9	1.00	1.83	1.83	159
Metribuzin	61.9	1.02	0.52	0.53	362
Mevinphos	*				
Oxamyl	2.1	1.10	0.55	0.61	14
Oxydemeton-methyl	*				
Paraquat 2/	*				
Paraquat 3/	1.3	1.00	0.28	0.28	4
PCNB	1.0	1.00	0.91	0.91	10
Pendimethalin	12.6	1.03	0.94	0.97	135
Permethrin	10.5	1.22	0.11	0.14	16
Phorate	30.5	1.00	2.96	2.96	991
Phosmet	1.6	1.13	0.90	1.02	18
Phosphamidon	9.0	1.25	0.51	0.64	63
Propargite	1.0	1.00	1.46	1.46	16
Rotenone	*				
Sethoxydim	1.7	1.00	0.27	0.27	5
Sulfur	1.2	1.00	3.94	3.94	52
Sulfuric acid	8.4	1.00	277.78	277.78	25,655
Trifluralin	5.3	1.00	0.69	0.69	40
Triphenyltin hydrox	7.3	1.61	0.21	0.34	27

* Applied on less than one percent of acres.
1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Used as a vine killer.
3/ Used as a herbicide.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey
National Agricultural Statistics Service, USDA.

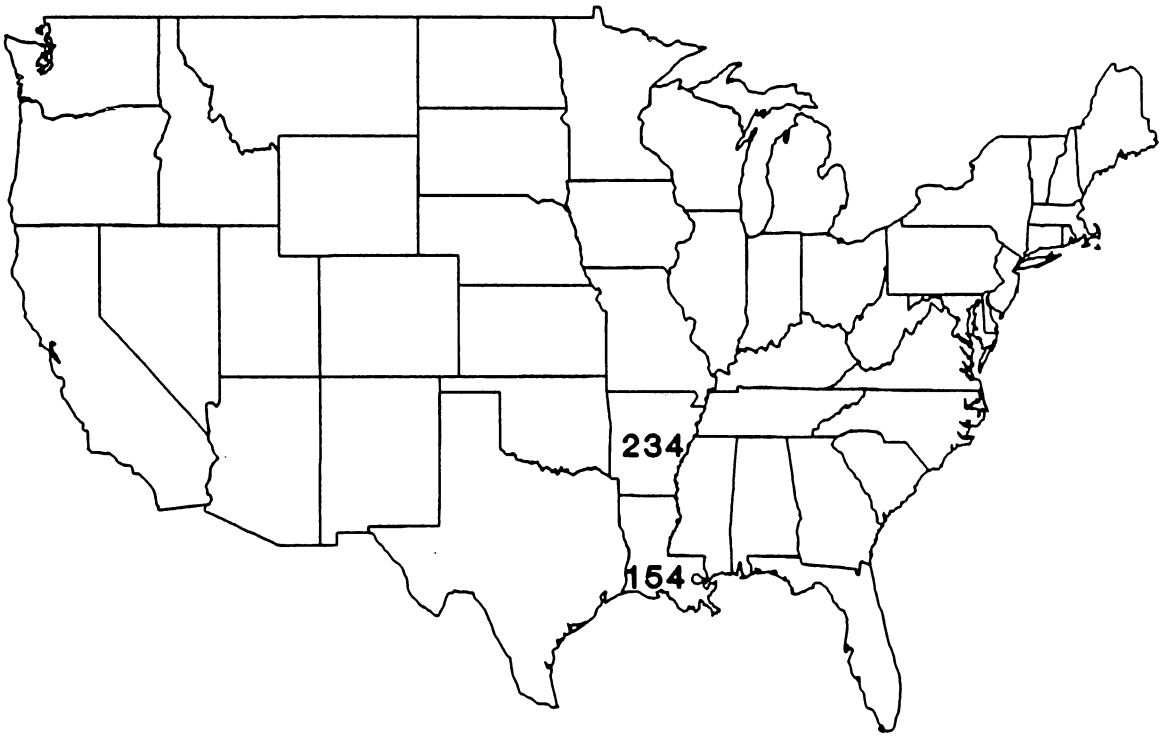
Rice

Two rice States, Arkansas and Louisiana, were included in the 1990 survey. These States represent 1.8 million acres, 62 percent of the U.S. total planted acres. Data were collected on herbicides, insecticides, fungicides, and harvest aids. Active ingredients reported in the survey data included 12 herbicides, 2 insecticides, 3 fungicides, and 1 harvest aid.

Nitrogen application practices were very similar in the two States while application of phosphate was limited to 15 percent of the acres in Arkansas compared to 81 percent in Louisiana. The same relationship exists with potash applications, highlighting the differences in soil conditions between the two States.

Herbicide use was widespread in both States while insecticides, fungicides, and harvest aids were used sparingly. Insecticides and fungicides were applied to 10.4 percent and 11.9 percent of the acreage, respectively. Pesticide application practices in the two States were generally similar.

Rice: Number of Usable Reports, 1990



Rice: Total Acreage and Percentage of Acreage Receiving Fertilizer Applications of Primary Plant Nutrients, Major States, 1990

State	Area Planted	Area Receiving 1/ Nitrogen	Phosphate	Potash
	1,000 Acres	Percent		
AR	1,240	97	15	18
LA	555	99	81	79
Total	1,795	97.2	35.3	36.6

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Rice: Frequency and Extent of Nitrogen Fertilizer Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Rate per Application	Rate per Crop Year	Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	Million Pounds
AR	1,240	97	2.20	52	114	137
LA	555	99	2.25	51	115	63
Total	1,795	97.2	2.21	51.9	114.6	200

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Rice: Frequency and Extent of Phosphate Fertilizer Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Rate per Application	Rate per Crop Year	Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	Million Pounds
AR	1,240	15	1.00	47	47	9
LA	555	81	1.02	44	45	20
Total	1,795	35.3	1.02	44.9	45.8	29

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Rice: Frequency and Extent of Potash Fertilizer Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Rate per Application	Rate per Crop Year	Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	Million Pounds
AR	1,240	18	1.00	57	57	13
LA	555	79	1.02	44	45	20
Total	1,795	36.6	1.02	49.2	50.2	33

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Rice: Total Acreage and Percentage of Acreage Receiving Herbicide Applications, Major States, 1990

State	Area Planted	Area Receiving Herbicides 1/
	1,000 Acres	Percent
AR	1,240	98
LA	555	97
Total	1,795	97.5

1/ Refers to acres receiving one or more applications of a herbicide.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Rice: Total Acreage and Percentage of Acreage Receiving Insecticide Applications, Major States, 1990

State	Area Planted	Area Receiving Insecticides 1/
	1,000 Acres	Percent
AR	1,240	3
LA	555	28
Total	1,795	10.4

1/ Refers to acres receiving one or more applications of an insecticide.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Rice: Total Acreage and Percentage of Acreage Receiving Fungicide Applications, Major States, 1990

State	Area Planted	Area Receiving Fungicides 1/
	1,000 Acres	Percent
AR	1,240	11
LA	555	14
Total	1,795	11.9

1/ Refers to acres receiving one or more applications of a fungicide.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Rice: Frequency and Extent of 2,4-D Usage,
Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AR	1,240	11	1.00	0.86	0.86	117
LA	555	29	1.00	0.96	0.96	155
Total	1,795	16.7	1.00	0.91	0.91	272

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Rice: Frequency and Extent of Benomyl Usage,
Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AR	1,240	6	1.47	0.54	0.80	60
LA	555	7	1.00	0.55	0.55	21
Total	1,795	6.7	1.31	0.51	0.67	81

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Rice: Frequency and Extent of Bentazon Usage,
Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AR	1,240	3	1.00	0.86	0.86	32
LA	555	6	1.00	0.90	0.90	30
Total	1,795	4.0	1.00	0.86	0.86	62

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Rice: Frequency and Extent of Carbofuran Usage,
Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AR	1,240	2	1.00	0.55	0.55	14
LA	555	21	1.00	0.52	0.52	61
Total	1,795	7.8	1.00	0.54	0.54	75

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Rice: Frequency and Extent of Fenoxaprop-ethyl Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AR	1,240	11	1.08	0.14	0.15	20
LA	555	3	1.20	0.13	0.15	2
Total	1,795	8.4	1.10	0.14	0.15	22

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Rice: Frequency and Extent of Molinate Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AR	1,240	38	1.18	2.80	3.30	1,555
LA	555	52	1.14	2.61	2.98	860
Total	1,795	42.3	1.16	2.74	3.18	2,415

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Rice: Frequency and Extent of Propanil Usage,
Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AR	1,240	94	1.34	3.43	4.60	5,362
LA	555	64	1.12	2.94	3.29	1,169
Total	1,795	84.3	1.29	3.35	4.32	6,531

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Rice: Frequency and Extent of Propiconazole Usage,
Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AR	1,240	4	1.00	0.27	0.27	13
LA	555	6	1.00	0.24	0.24	8
Total	1,795	4.7	1.00	0.25	0.25	21

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Rice: Frequency and Extent of Thiobencarb Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AR	1,240	10	1.21	2.45	2.96	367
LA	555	.9	1.00	2.50	2.50	125
Total	1,795	10.0	1.15	2.38	2.74	492

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Rice: Frequency and Extent of Pesticide Usage
by Active Ingredient,
Major States, 1990

Active Ingredient	Area Applied 1/	Applications	Rate per Application	Rate per Crop Year	Total Applied
	Percent	Number	Pounds	Pounds	1,000 Pounds
2,4-D	16.7	1.00	0.91	0.91	272
Acifluorfen	3.2	1.00	0.17	0.17	10
Benomyl	6.7	1.31	0.51	0.67	81
Bensulfuron-methyl	*				
Bentazon	4.0	1.00	0.86	0.86	62
Bromoxynil	4.0	1.07	0.34	0.36	26
Carbofuran	7.8	1.00	0.54	0.54	75
Fenoxaprop-ethyl	8.4	1.10	0.14	0.15	22
Glyphosate	1.4	1.00	0.60	0.60	15
Iprodione	1.6	1.18	0.53	0.63	18
Methyl parathion	2.8	1.00	0.38	0.38	19
Molinate	42.3	1.16	2.74	3.18	2,415
Pendimethalin	8.8	1.03	0.86	0.89	140
Propanil	84.3	1.29	3.35	4.32	6,531
Propiconazole	4.7	1.00	0.25	0.25	21
Sodium chlorate	1.2	1.00	6.92	6.92	149
Thiobencarb	10.0	1.15	2.38	2.74	492
Triclopyr	1.7	1.00	0.36	0.36	11

* Applied on less than one percent of acres.
1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.

Source: Agricultural Chemical Usage Survey, National Agricultural Statistics Service, USDA.

Soybeans

Nitrogen use on **soybeans** varied greatly between States. The percent of acres treated ranged from a low of 8 percent in Missouri to a high of 67 percent in Michigan. The average number of nitrogen applications was 1.05, ranging from 1.00 to 1.27 applications per acre. Rates per application of nitrogen were lowest in Wisconsin and highest in Mississippi. Application rates per acre for the entire crop year were lowest in Ohio and Wisconsin and highest in Mississippi.

The percent of acres treated with phosphate was highest in the south and eastern coastal States. In Iowa, 11 percent of the acres received phosphate treatments, compared with 90 percent in Florida. Twenty-four of the 29 States had phosphate application rates above 35 pounds per acre.

The percent of soybean acreage treated with potash generally parallelled phosphate applications, especially in the southern States. Application rates were lowest in North Dakota and highest in Ohio.

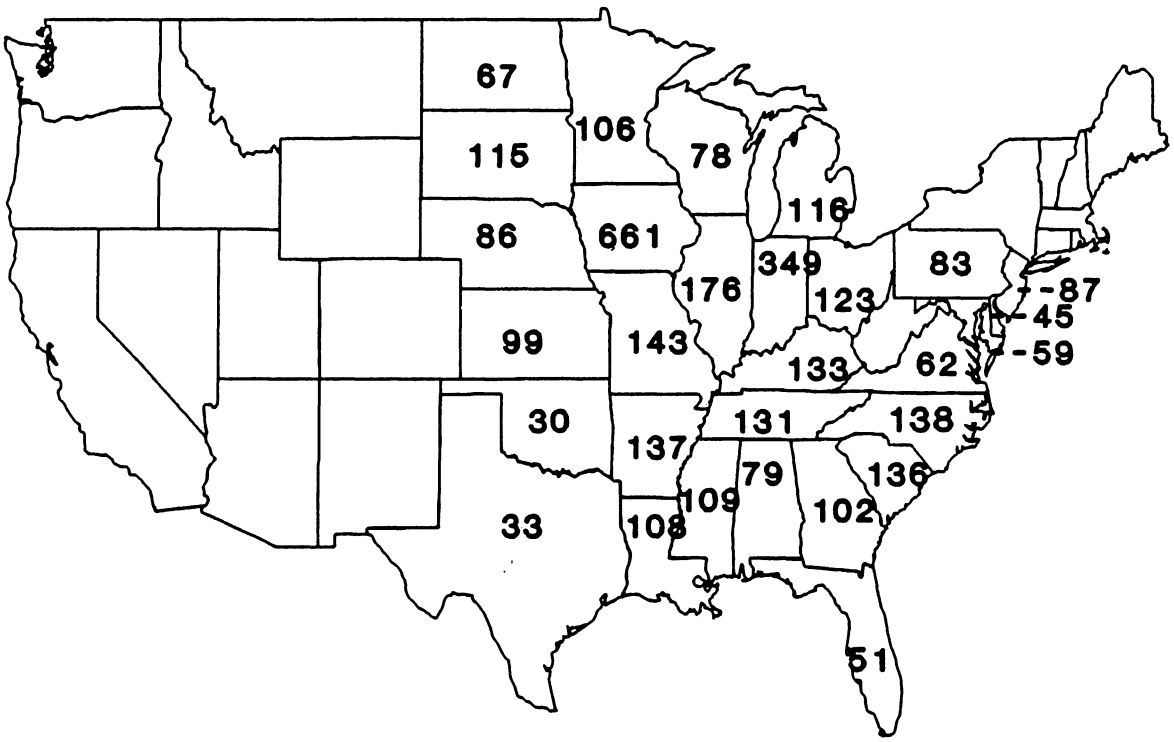
Herbicide use was widespread. Over one-third of the soybean acreage received the herbicide trifluralin, with several States treating over half of their acreage.

Insecticide use was reported in 14 of the 29 States. Insecticide treatments were most common in the southeast, especially Georgia, and in the Dakota's. Fungicide use was reported in six of the 29 States. However, these insecticide and fungicide data are not published because of an insufficient number of reports.

Information on 34 different herbicides, 18 insecticides, and 2 fungicides were collected in the survey. Data on defoliants and other chemicals were not asked as part of the 1990 survey. The number of usable reports and States in the survey are shown on the U.S. map. A total of 57.8 million soybean acres were represented in the survey, 100 percent of the total planted acres.

NOTE: Additional State funding by Indiana and Iowa made it possible to select a larger sample in these two States allowing for publication of more detailed pesticide data. For other States, the sample was too thin for some products to be published separately.

Soybeans: Number of Usable Reports, 1990



Soybeans: Total Acreage and Percentage of Acreage Receiving Fertilizer Applications of Primary Plant Nutrients, Major States, 1990

State	Area Planted	Area Receiving 1/ Nitrogen	Phosphate	Potash
	1,000 Acres	Percent		
AL	470	39	62	66
AR	3,400	13	24	26
DE	200	35	33	47
FL	80	47	90	90
GA	900	55	68	69
IL	9,200	16	27	34
IN	4,200	23	36	45
IA	8,000	9	11	13
KS	2,000	17	14	7
KY	1,250	36	49	46
LA	1,800	15	30	27
MD	505	59	66	66
MI	1,150	67	70	78
MN	4,700	12	12	13
MS	2,050	13	19	23
MO	4,200	8	14	15
NE	2,400	15	12	5
NJ	110	64	70	82
NC	1,400	51	62	67
ND	500	30	27	15
OH	3,500	20	28	46
OK	250	37	37	37
PA	280	51	58	58
SC	800	45	64	66
SD	1,950	21	23	10
TN	1,300	35	50	51
TX	220	45	61	42
VA	540	63	53	65
WI	440	56	65	67
Total	57,795	20.5	27.2	30.1

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Soybeans: Frequency and Extent of Nitrogen Fertilizer Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Rate per Application	Rate per Crop Year	Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	Million Pounds
AL	470	39	1.00	22	22	4
AR	3,400	13	1.17	32	38	17
DE	200	35	1.00	38	38	3
FL	80	47	1.04	22	23	1
GA	900	55	1.02	19	19	9
IL	9,200	16	1.00	25	25	37
IN	4,200	23	1.11	14	15	14
IA	8,000	9	1.03	32	33	24
KS	2,000	17	1.00	15	15	5
KY	1,250	36	1.06	38	40	18
LA	1,800	15	1.00	23	23	6
MD	505	59	1.06	25	26	8
MI	1,150	67	1.06	19	20	15
MN	4,700	12	1.08	15	16	9
MS	2,050	13	1.07	40	43	11
MO	4,200	8	1.00	21	21	7
NE	2,400	15	1.00	32	32	12
NJ	110	64	1.00	19	19	1
NC	1,400	51	1.01	16	16	11
ND	500	30	1.10	21	23	3
OH	3,500	20	1.04	11	11	8
OK	250	37	1.27	23	29	3
PA	280	51	1.05	16	17	2
SC	800	45	1.03	16	16	6
SD	1,950	21	1.00	16	16	7
TN	1,300	35	1.02	29	30	14
TX	220	45	1.27	24	31	3
VA	540	63	1.10	32	35	12
WI	440	56	1.07	10	11	3
Total	57,795	20.5	1.05	21.9	23.0	273

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Soybeans: Frequency and Extent of Phosphate Fertilizer Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Rate per Application	Rate per Crop Year	Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	Million Pounds
AL	470	62	1.02	51	52	15
AR	3,400	24	1.06	50	53	43
DE	200	33	1.00	46	46	3
FL	80	90	1.02	56	57	4
GA	900	68	1.00	40	40	24
IL	9,200	27	1.02	57	58	144
IN	4,200	36	1.07	38	41	62
IA	8,000	11	1.00	42	42	37
KS	2,000	14	1.00	30	30	8
KY	1,250	49	1.02	71	72	44
LA	1,800	30	1.00	45	45	24
MD	505	66	1.00	46	46	15
MI	1,150	70	1.00	42	42	34
MN	4,700	12	1.00	34	34	19
MS	2,050	19	1.05	37	39	15
MO	4,200	14	1.00	41	41	24
NE	2,400	12	1.00	40	40	12
NJ	110	70	1.00	37	37	3
NC	1,400	62	1.01	40	40	35
ND	500	27	1.00	34	34	5
OH	3,500	28	1.06	44	47	46
OK	250	37	1.27	22	28	3
PA	280	58	1.04	41	43	7
SC	800	64	1.03	36	37	19
SD	1,950	23	1.00	36	36	16
TN	1,300	50	1.00	42	42	27
TX	220	61	1.00	51	51	7
VA	540	53	1.00	63	63	18
WI	440	65	1.02	30	31	9
Total	57,795	27.2	1.02	45.0	45.9	722

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Soybeans: Frequency and Extent of Potash Fertilizer Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Rate per Application	Rate per Crop Year	Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	Million Pounds
AL	470	66	1.00	66	66	20
AR	3,400	26	1.00	67	67	59
DE	200	47	1.00	97	97	9
FL	80	90	1.00	82	82	6
GA	900	69	1.00	69	69	43
IL	9,200	34	1.00	96	96	300
IN	4,200	45	1.08	79	85	161
IA	8,000	13	1.00	57	57	59
KS	2,000	7	1.00	37	37	5
KY	1,250	46	1.02	82	84	48
LA	1,800	27	1.00	55	55	27
MD	505	66	1.00	67	67	22
MI	1,150	78	1.10	70	77	69
MN	4,700	13	1.07	58	62	38
MS	2,050	23	1.04	64	67	32
MO	4,200	15	1.00	63	63	40
NE	2,400	5	1.00	32	32	4
NJ	110	82	1.00	78	78	7
NC	1,400	67	1.01	84	85	80
ND	500	15	1.00	15	15	1
OH	3,500	46	1.04	100	104	167
OK	250	37	1.27	28	36	3
PA	280	58	1.04	52	54	9
SC	800	66	1.02	82	84	44
SD	1,950	10	1.00	20	20	4
TN	1,300	51	1.00	56	56	37
TX	220	42	1.00	75	75	7
VA	540	65	1.00	96	96	34
WI	440	67	1.15	65	75	22
Total	57,795	30.1	1.03	75.7	78.0	1,357

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Soybeans: Total Acreage and Percentage of Acreage Receiving Herbicide Applications, Major States, 1990

State	Area Planted	Area Receiving Herbicides 1/
	1,000 Acres	Percent
AL	470	92
AR	3,400	87
DE	200	89
FL	80	94
GA	900	90
IL	9,200	99
IN	4,200	96
IA	8,000	97
KS	2,000	88
KY	1,250	100
LA	1,800	96
MD	505	98
MI	1,150	98
MN	4,700	99
MS	2,050	92
MO	4,200	91
NE	2,400	93
NJ	110	98
NC	1,400	93
ND	500	96
OH	3,500	94
OK	250	54
PA	280	91
SC	800	94
SD	1,950	93
TN	1,300	99
TX	220	85
VA	540	92
WI	440	93
Total	57,795	94.8

1/ Refers to acres receiving one or more applications of a herbicide.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Soybeans: Frequency and Extent of Acifluorfen Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AL 2/	470					
AR	3,400	12	1.00	0.23	0.23	94
DE 2/	200					
FL 2/	80					
GA 2/	900					
IL	9,200	8	1.00	0.20	0.20	147
IN	4,200	8	1.00	0.25	0.25	84
IA	8,000	7	1.02	0.22	0.22	123
KS 2/	2,000					
KY	1,250	17	1.09	0.34	0.37	79
LA	1,800	11	1.17	0.32	0.38	75
MD 2/	505					
MI 2/	1,150					
MN 2/	4,700					
MS	2,050	15	1.06	0.22	0.23	71
MO 2/	4,200					
NE 2/	2,400					
NJ 2/	110					
NC	1,400	9	1.00	0.34	0.34	43
ND 2/	500					
OH 2/	3,500					
OK 2/	250					
PA 2/	280					
SC 2/	800					
SD 2/	1,950					
TN	1,300	13	1.06	0.31	0.33	56
TX 2/	220					
VA 2/	540					
WI 2/	440					
Total	57,795	7.2	1.02	0.25	0.25	1,051

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Soybeans: Frequency and Extent of Alachlor Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AL	470	16	1.00	1.28	1.28	96
AR 2/	3,400					
DE 2/	200					
FL	80	27	1.00	1.04	1.04	22
GA 2/	900					
IL	9,200	14	1.00	1.87	1.87	2,409
IN	4,200	26	1.00	2.05	2.05	2,239
IA	8,000	9	1.02	1.97	2.01	1,447
KS	2,000	13	1.00	1.62	1.62	421
KY	1,250	28	1.05	2.47	2.59	907
LA 2/	1,800					
MD 2/	505					
MI	1,150	25	1.07	1.93	2.06	592
MN	4,700	17	1.06	2.02	2.14	1,710
MS 2/	2,050					
MO	4,200	8	1.00	1.40	1.40	470
NE	2,400	12	1.00	1.12	1.12	323
NJ	110	22	1.00	1.78	1.78	43
NC	1,400	39	1.02	1.94	1.98	1,081
ND 2/	500					
OH	3,500	21	1.00	2.05	2.05	1,507
OK 2/	250					
PA	280	28	1.00	1.92	1.92	151
SC	800	18	1.00	1.86	1.86	268
SD 2/	1,950					
TN 2/	1,300					
TX	220	42	1.00	1.02	1.02	94
VA	540	19	1.00	1.71	1.71	175
WI	440	17	1.00	2.00	2.00	150
Total	57,795	13.3	1.01	1.89	1.91	14,720

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Soybeans: Frequency and Extent of Bentazon Usage,
Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AL 2/	470					
AR	3,400	11	1.00	0.52	0.52	194
DE 2/	200					
FL 2/	80					
GA 2/	900					
IL	9,200	31	1.00	0.63	0.63	1,797
IN	4,200	15	1.00	0.75	0.75	473
IA	8,000	20	1.01	0.72	0.73	1,168
KS 2/	2,000					
KY	1,250	13	1.00	0.55	0.55	89
LA 2/	1,800					
MD 2/	505					
MI	1,150	9	1.10	0.71	0.78	81
MN	4,700	25	1.04	0.63	0.65	764
MS	2,050	13	1.00	0.45	0.45	120
MO 2/	4,200					
NE 2/	2,400					
NJ 2/	110					
NC 2/	1,400					
ND	500	57	1.08	0.72	0.78	222
OH	3,500	12	1.00	0.79	0.79	332
OK 2/	250					
PA 2/	280					
SC 2/	800					
SD	1,950	18	1.00	0.84	0.84	295
TN	1,300	8	1.00	0.66	0.66	69
TX 2/	220					
VA 2/	540					
WI 2/	440					
Total	57,795	15.8	1.01	0.66	0.67	6,129

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Soybeans: Frequency and Extent of Chlorimuron-ethyl Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AL	470	33	1.00	0.01	0.01	2
AR	3,400	7	1.10	0.02	0.02	5
DE	200	24	1.36	0.04	0.05	2
FL	80	24	1.08	0.01	0.01	0
GA	900	12	1.08	0.01	0.01	1
IL	9,200	27	1.06	0.03	0.03	75
IN	4,200	32	1.10	0.03	0.03	40
IA	8,000	20	1.02	0.01	0.01	16
KS	2,000	15	1.00	0.01	0.01	3
KY	1,250	20	1.04	0.04	0.04	10
LA	1,800	14	1.13	0.03	0.03	8
MD	505	33	1.05	0.04	0.04	7
MI	1,150	26	1.03	0.03	0.03	9
MN 2/	4,700					
MS	2,050	25	1.00	0.02	0.02	10
MO	4,200	17	1.04	0.03	0.03	21
NE	2,400	16	1.00	0.02	0.02	8
NJ	110	46	1.00	0.04	0.04	2
NC	1,400	16	1.05	0.03	0.03	7
ND 2/	500					
OH	3,500	35	1.08	0.03	0.03	37
OK 2/	250					
PA	280	19	1.00	0.04	0.04	2
SC	800	43	1.11	0.04	0.04	14
SD 2/	1,950					
TN	1,300	31	1.03	0.03	0.03	12
TX 2/	220					
VA	540	19	1.00	0.03	0.03	3
WI 2/	440					
Total	57,795	20.1	1.05	0.03	0.03	297

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Soybeans: Frequency and Extent of Clomazone Usage,
Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AL 2/	470					
AR 2/	3,400					
DE 2/	200					
FL 2/	80					
GA 2/	900					
IL	9,200	8	1.00	0.61	0.61	449
IN	4,200	11	1.00	0.78	0.78	360
IA	8,000	13	1.00	0.69	0.69	718
KS 2/	2,000					
KY 2/	1,250					
LA	1,800	17	1.00	0.63	0.63	193
MD 2/	505					
MI 2/	1,150					
MN 2/	4,700					
MS 2/	2,050					
MO	4,200	11	1.00	0.72	0.72	333
NE	2,400	17	1.00	0.62	0.62	253
NJ 2/	110					
NC 2/	1,400					
ND 2/	500					
OH 2/	3,500					
OK 2/	250					
PA 2/	280					
SC 2/	800					
SD 2/	1,950					
TN 2/	1,300					
TX 2/	220					
VA 2/	540					
WI	440	22	1.00	0.74	0.74	72
Total	57,795	7.1	1.00	0.67	0.67	2,738

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Soybeans: Frequency and Extent of Fluazifop-P-butyl Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AL 2/	470					
AR 2/	3,400					
DE 2/	200					
FL 2/	80					
GA 2/	900					
IL 2/	9,200					
IN	4,200	4	1.00	0.18	0.18	30
IA	8,000	7	1.08	0.13	0.14	78
KS 2/	2,000					
KY	1,250	34	1.00	0.15	0.15	64
LA	1,800	25	1.04	0.13	0.14	63
MD 2/	505					
MI 2/	1,150					
MN 2/	4,700					
MS 2/	2,050					
MO 2/	4,200					
NE 2/	2,400					
NJ 2/	110					
NC 2/	1,400					
ND 2/	500					
OH 2/	3,500					
OK 2/	250					
PA 2/	280					
SC 2/	800					
SD 2/	1,950					
TN	1,300	28	1.00	0.18	0.18	66
TX 2/	220					
VA 2/	540					
WI 2/	440					
Total	57,795	5.5	1.03	0.15	0.15	474

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Soybeans: Frequency and Extent of Glyphosate Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AL 2/	470					
AR 2/	3,400					
DE 2/	200					
FL 2/	80					
GA 2/	900					
IL 2/	9,200					
IN	4,200	5	1.00	1.39	1.39	292
IA	8,000	9	1.00	0.28	0.28	202
KS 2/	2,000					
KY	1,250	28	1.00	1.38	1.38	483
LA	1,800	9	1.00	0.78	0.78	126
MD 2/	505					
MI 2/	1,150					
MN	4,700	13	1.00	0.98	0.98	599
MS 2/	2,050					
MO 2/	4,200					
NE 2/	2,400					
NJ 2/	110					
NC	1,400	12	1.00	1.16	1.16	195
ND 2/	500					
OH 2/	3,500					
OK 2/	250					
PA 2/	280					
SC 2/	800					
SD 2/	1,950					
TN	1,300	8	1.00	0.90	0.90	94
TX 2/	220					
VA 2/	540					
WI 2/	440					
Total	57,795	5.4	1.00	0.85	0.85	2,663

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Soybeans: Frequency and Extent of Imazaquin Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AL	470	18	1.00	0.11	0.11	9
AR	3,400	31	1.09	0.09	0.10	105
DE 2/	200					
FL 2/	80					
GA 2/	900					
IL	9,200	11	1.05	0.12	0.13	132
IN	4,200	14	1.03	0.10	0.10	59
IA 2/	8,000					
KS	2,000	20	1.05	0.11	0.12	48
KY	1,250	25	1.03	0.11	0.11	34
LA	1,800	31	1.00	0.10	0.10	56
MD	505	23	1.00	0.11	0.11	13
MI 2/	1,150					
MN 2/	4,700					
MS	2,050	32	1.11	0.09	0.10	66
MO	4,200	41	1.05	0.11	0.12	207
NE	2,400	12	1.00	0.09	0.09	26
NJ	110	21	1.00	0.12	0.12	3
NC	1,400	26	1.00	0.11	0.11	40
ND 2/	500					
OH	3,500	14	1.13	0.12	0.13	64
OK	250	43	1.00	0.09	0.09	10
PA 2/	280					
SC	800	13	1.00	0.10	0.10	10
SD 2/	1,950					
TN	1,300	44	1.03	0.10	0.10	57
TX 2/	220					
VA	540	44	1.04	0.11	0.11	26
WI 2/	440					
Total	57,795	15.9	1.05	0.10	0.11	1,010

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Soybeans: Frequency and Extent of Imazethapyr Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AL 2/	470					
AR 2/	3,400					
DE 2/	200					
FL 2/	80					
GA 2/	900					
IL	9,200	9	1.00	0.06	0.06	50
IN	4,200	8	1.00	0.06	0.06	20
IA	8,000	22	1.00	0.05	0.05	88
KS 2/	2,000					
KY	1,250	11	1.14	0.07	0.08	11
LA 2/	1,800					
MD 2/	505					
MI	1,150	21	1.00	0.06	0.06	14
MN	4,700	35	1.00	0.06	0.06	99
MS 2/	2,050					
MO	4,200	7	1.00	0.06	0.06	18
NE	2,400	16	1.00	0.06	0.06	23
NJ 2/	110					
NC 2/	1,400					
ND 2/	500					
OH 2/	3,500					
OK 2/	250					
PA 2/	280					
SC 2/	800					
SD	1,950	10	1.00	0.05	0.05	10
TN 2/	1,300					
TX 2/	220					
VA 2/	540					
WI	440	29	1.00	0.06	0.06	8
Total	57,795	11.1	1.00	0.06	0.06	370

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Soybeans: Frequency and Extent of Linuron Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AL 2/	470					
AR 2/	3,400					
DE	200	58	1.15	0.55	0.63	73
FL 2/	80					
GA 2/	900					
IL 2/	9,200					
IN	4,200	15	1.00	0.56	0.56	353
IA 2/	8,000					
KS 2/	2,000					
KY	1,250	11	1.00	0.61	0.61	84
LA 2/	1,800					
MD	505	56	1.03	0.56	0.58	164
MI	1,150	29	1.00	0.72	0.72	240
MN 2/	4,700					
MS 2/	2,050					
MO 2/	4,200					
NE 2/	2,400					
NJ	110	68	1.03	0.50	0.51	38
NC	1,400	10	1.00	0.97	0.97	136
ND 2/	500					
OH	3,500	10	1.00	0.80	0.80	280
OK 2/	250					
PA	280	63	1.00	0.51	0.51	90
SC 2/	800					
SD 2/	1,950					
TN 2/	1,300					
TX 2/	220					
VA	540	31	1.00	0.48	0.48	80
WI 2/	440					
Total	57,795	5.6	1.03	0.61	0.63	2,032

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Soybeans: Frequency and Extent of Metolachlor Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AL 2/	470					
AR	3,400	8	1.00	1.50	1.50	408
DE	200	49	1.18	1.37	1.62	159
FL 2/	80					
GA 2/	900					
IL	9,200	10	1.00	1.86	1.86	1,711
IN	4,200	19	1.00	1.71	1.71	1,365
IA	8,000	4	1.00	2.05	2.05	656
KS 2/	2,000					
KY 2/	1,250					
LA	1,800	21	1.00	1.85	1.85	699
MD	505	49	1.04	1.75	1.82	450
MI	1,150	27	1.03	1.64	1.69	525
MN 2/	4,700					
MS 2/	2,050					
MO 2/	4,200					
NE 2/	2,400					
NJ	110	49	1.00	1.89	1.89	102
NC	1,400	8	1.00	1.51	1.51	169
ND 2/	500					
OH	3,500	30	1.00	2.00	2.00	2,100
OK 2/	250					
PA	280	35	1.00	2.00	2.00	196
SC	800	14	1.00	1.75	1.75	196
SD 2/	1,950					
TN 2/	1,300					
TX 2/	220					
VA	540	16	1.00	1.40	1.40	121
WI 2/	440					
Total	57,795	9.7	1.01	1.74	1.76	9,858

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.

2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Soybeans: Frequency and Extent of Metribuzin Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AL 2/	470					
AR	3,400	15	1.00	0.27	0.27	138
DE 2/	200					
FL 2/	80					
GA	900	43	1.00	0.35	0.35	135
IL	9,200	20	1.00	0.32	0.32	589
IN	4,200	34	1.00	0.30	0.30	428
IA	8,000	11	1.09	0.31	0.34	299
KS	2,000	10	1.00	0.29	0.29	58
KY	1,250	11	1.00	0.31	0.31	43
LA	1,800	29	1.03	0.33	0.34	177
MD 2/	505					
MI	1,150	39	1.07	0.36	0.39	175
MN 2/	4,700					
MS	2,050	25	1.00	0.29	0.29	149
MO	4,200	13	1.00	0.27	0.27	147
NE	2,400	22	1.00	0.31	0.31	164
NJ 2/	110					
NC	1,400	8	1.00	0.41	0.41	46
ND 2/	500					
OH	3,500	51	1.02	0.36	0.37	660
OK 2/	250					
PA 2/	280					
SC	800	29	1.05	0.33	0.35	81
SD 2/	1,950					
TN	1,300	24	1.00	0.30	0.30	94
TX 2/	220					
VA 2/	540					
WI	440	22	1.00	0.36	0.36	35
Total	57,795	19.1	1.02	0.31	0.32	3,569

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Soybeans: Frequency and Extent of Pendimethalin Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AL	470	23	1.00	0.68	0.68	74
AR	3,400	17	1.00	0.82	0.82	474
DE 2/	200					
FL	80	20	1.00	0.72	0.72	12
GA	900	23	1.00	0.78	0.78	161
IL	9,200	14	1.00	0.94	0.94	1,211
IN	4,200	7	1.00	0.83	0.83	244
IA	8,000	9	1.00	1.15	1.15	828
KS	2,000	11	1.00	0.92	0.92	202
KY	1,250	8	1.00	0.86	0.86	86
LA	1,800	18	1.05	0.71	0.75	243
MD	505	21	1.00	0.80	0.80	85
MI	1,150	19	1.14	0.78	0.89	194
MN	4,700	9	1.00	1.11	1.11	470
MS	2,050	19	1.00	0.74	0.74	288
MO	4,200	26	1.03	0.73	0.75	819
NE	2,400	16	1.00	0.90	0.90	346
NJ	110	11	1.00	0.75	0.75	9
NC	1,400	15	1.10	0.65	0.71	149
ND 2/	500					
OH	3,500	11	1.00	0.76	0.76	293
OK 2/	250					
PA	280	16	1.00	0.97	0.97	43
SC	800	11	1.00	0.70	0.70	62
SD 2/	1,950					
TN	1,300	16	1.00	0.74	0.74	154
TX 2/	220					
VA	540	29	1.00	0.62	0.62	97
WI 2/	440					
Total	57,795	13.5	1.01	0.86	0.87	6,797

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Soybeans: Frequency and Extent of Trifluralin Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AL	470	39	1.06	0.73	0.77	141
AR	3,400	39	1.02	0.78	0.80	1,061
DE 2/	200					
FL	80	47	1.00	0.81	0.81	30
GA	900	38	1.00	0.74	0.74	253
IL	9,200	41	1.01	0.79	0.80	3,018
IN	4,200	19	1.00	0.79	0.79	630
IA	8,000	56	1.01	0.82	0.83	3,718
KS	2,000	41	1.02	0.82	0.84	689
KY	1,250	29	1.05	0.83	0.87	315
LA	1,800	28	1.03	0.83	0.85	428
MD 2/	505					
MI 2/	1,150					
MN	4,700	53	1.02	0.80	0.82	2,043
MS	2,050	43	1.00	0.82	0.82	723
MO	4,200	29	1.02	0.81	0.83	1,011
NE	2,400	47	1.03	0.82	0.84	948
NJ 2/	110					
NC	1,400	16	1.00	0.85	0.85	190
ND	500	49	1.00	0.86	0.86	211
OH 2/	3,500					
OK 2/	250					
PA 2/	280					
SC	800	44	1.00	0.78	0.78	275
SD	1,950	64	1.00	0.82	0.82	1,023
TN	1,300	50	1.00	0.85	0.85	553
TX 2/	220					
VA 2/	540					
WI 2/	440					
Total	57,795	37.2	1.01	0.81	0.82	17,573

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Soybeans: Frequency and Extent of Pesticide Usage
by Active Ingredient,
Major States, 1990

Active Ingredient	Area Applied 1/	Applications	Rate per Application	Rate per Crop Year	Total Applied
	Percent	Number	Pounds	Pounds	1,000 Pounds
2,4-DB	2.6	1.01	0.22	0.22	328
Acephate	*				
Acifluorfen	7.2	1.02	0.25	0.25	1,051
Alachlor	13.3	1.01	1.89	1.91	14,720
Aldicarb	*				
Barban	*				
Benomyl	*				
Bentazon	15.8	1.01	0.66	0.67	6,129
Bt (Bacillus thur.)	*				
Carbaryl	*				
Carbofuran	*				
Chloramben	1.1	1.06	1.04	1.10	698
Chlorimuron-ethyl	20.1	1.05	0.03	0.03	297
Chlorpropham	*				
Chlorpyrifos	*				
Clomazone	7.1	1.00	0.67	0.67	2,738
Dalapon	*				
Diazinon	*				
Diclofop-methyl	*				
Diflubenzuron	*				
Dimethoate	*				
Esfenvalerate	*				
Ethalfluralin	4.8	1.00	0.86	0.86	2,380
Ethoprop	*				
Ethyl parathion	*				
Fenoxaprop-ethyl	*				
Fluazifop-P-butyl	5.5	1.03	0.15	0.15	474
Fomesafen	2.4	1.01	0.32	0.32	441
Glyphosate	5.4	1.00	0.85	0.85	2,663
Imazaquin	15.9	1.05	0.10	0.11	1,010
Imazethapyr	11.1	1.00	0.06	0.06	370
Lactofen	1.3	1.00	0.18	0.18	133
Linuron	5.6	1.03	0.61	0.63	2,032
Malathion	*				

Continued on Page 117.

Soybeans: Frequency and Extent of Pesticide Usage
by Active Ingredient,
Major States, 1990 **(Continued)**

Active Ingredient	Area Applied 1/	Appli- cations	Rate per Application	Rate per Crop Year	Total Applied
	Percent	**Number**	**Pounds**	**Pounds**	**1,000 Pounds**
Metalaxyl	*				
Methomyl	*				
Methyl parathion	*				
Metolachlor	9.7	1.01	1.74	1.76	9,858
Metribuzin	19.1	1.02	0.31	0.32	3,569
Naptalam	*				
Norflurazon	*				
Oryzalin	*				
Oxyfluorfen	*				
Paraquat	1.9	1.00	0.33	0.33	364
Pendimethalin	13.5	1.01	0.86	0.87	6,797
Permethrin	*				
Phorate	*				
Propachlor	*				
Quizalofop-ethyl	2.8	1.02	0.09	0.09	148
Sethoxydim	4.3	1.00	0.21	0.21	528
Thifensulfuron	3.8	1.00	2/	2/	9
Thiodicarb	*				
Tralomethrin	*				
Trifluralin	37.2	1.01	0.81	0.82	17,573
Vernolate	*				

* Applied on less than one percent of acres.
1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Rate per application and rate per crop year were less than .01 pound.

Source: Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Soybeans: Frequency and Extent of Pesticide Usage
by Active Ingredient,
Indiana, 1990

Active Ingredient	Area Applied 1/	Appli-cations	Rate per Application	Rate per Crop Year	Total Applied
	Percent	Number	Pounds	Pounds	1,000 Pounds
2,4-DB	2	1.00	0.34	0.34	29
Acifluorfen	8	1.00	0.25	0.25	84
Alachlor	26	1.00	2.05	2.05	2,239
Bentazon	15	1.00	0.75	0.75	473
Chloramben	2	1.00	0.89	0.89	75
Chlorimuron-ethyl	32	1.10	0.03	0.03	40
Clomazone	11	1.00	0.78	0.78	360
Ethalfluralin	4	1.00	0.75	0.75	126
Fluazifop-P-butyl	4	1.00	0.18	0.18	30
Fomesafen	2	1.00	0.26	0.26	22
Glyphosate	5	1.00	1.39	1.39	292
Imazaquin	14	1.03	0.10	0.10	59
Imazethapyr	8	1.00	0.06	0.06	20
Lactofen	3	1.00	0.15	0.15	19
Linuron	15	1.00	0.56	0.56	353
Metolachlor	19	1.00	1.71	1.71	1,365
Metribuzin	34	1.00	0.30	0.30	428
Oxyfluorfen	*				
Paraquat	2	1.00	0.50	0.50	42
Pendimethalin	7	1.00	0.83	0.83	244
Propachlor	2	1.00	2.60	2.60	218
Sethoxydim	4	1.00	0.24	0.24	40
Thifensulfuron	*				
Trifluralin	19	1.00	0.79	0.79	630

* Applied on less than one percent of acres.
1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient. Area planted in 1990 was 4.2 million acres.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey
National Agricultural Statistics Service, USDA.

Soybeans: Frequency and Extent of Pesticide Usage
by Active Ingredient,
Iowa, 1990

Active Ingredient	Area Applied 1/	Applications	Rate per Application	Rate per Crop Year	Total Applied
	Percent	Number	Pounds	Pounds	1,000 Pounds
2,4-DB	3	1.00	0.10	0.10	24
Acifluorfen	7	1.02	0.22	0.22	123
Alachlor	9	1.02	1.97	2.01	1,447
Barban	*				
Bentazon	20	1.01	0.72	0.73	1,168
Chloramben	2	1.00	0.93	0.93	149
Chlorimuron-ethyl	20	1.02	0.01	0.01	16
Clomazone	13	1.00	0.69	0.69	718
Diazinon	*				
Ethalfluralin	10	1.00	0.83	0.83	664
Fenoxaprop-ethyl	*				
Fluazifop-P-butyl	7	1.08	0.13	0.14	78
Glyphosate	9	1.00	0.28	0.28	202
Imazaquin	*				
Imazethapyr	22	1.00	0.05	0.05	88
Lactofen	*				
Linuron	*				
Metolachlor	4	1.00	2.05	2.05	656
Metribuzin	11	1.09	0.31	0.34	299
Paraquat	*				
Pendimethalin	9	1.00	1.15	1.15	828
Propachlor	*				
Quizalofop-ethyl	7	1.00	0.07	0.07	39
Sethoxydim	7	1.00	0.21	0.21	118
Thifensulfuron	13	1.00	0.00	0.00	0
Trifluralin	56	1.01	0.82	0.83	3,718
Vernolate	*				

* Applied on less than one percent of acres.
1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient. Area planted in 1990 was 8.0 million acres.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey
National Agricultural Statistics Service, USDA.

Wheat

Percentage of **winter wheat** acres treated with nitrogen was above 75 percent in most of the 12 States surveyed except Colorado, South Dakota, and Texas. The percent of acres treated ranged from a low of 41 percent in South Dakota to a high of 100 percent in Arkansas. None of the States surveyed averaged higher than 1.9 nitrogen treatments per acre.

Phosphate was applied in all 12 States. The percent of acres treated was highest in Ohio, Illinois, and Missouri. Colorado had the lowest use of phosphate with 17 percent of the acres treated. Rates per application and over the entire crop year were similar across States. Illinois and Ohio have the highest rates per acre.

Potash use was similar to phosphate application practices. Ohio, Illinois, and Missouri had the highest percents of acreage treated, rates per application, and rates applied per crop year.

Washington and Montana had widespread herbicide use while the midwest States had the lowest percent of acres treated. Herbicide rates per application were similar in all States. Herbicide application rates for the entire crop year were not significantly different, ranging from 0.1 pounds per acre to 0.5 pounds.

Other spring wheat percentage of area treated with nitrogen was highest in Minnesota at 97 percent. None of the surveyed States averaged more than 1.7 nitrogen treatments per acre. Rates of nitrogen were similar in the other States.

Phosphate and potash were applied in all four States. Potash use was not widespread in Montana and South Dakota. Growers generally used the same phosphate and potash application patterns as nitrogen. Minnesota was highest in number of applications, rate per application, and rate per crop year for both phosphorus and potash.

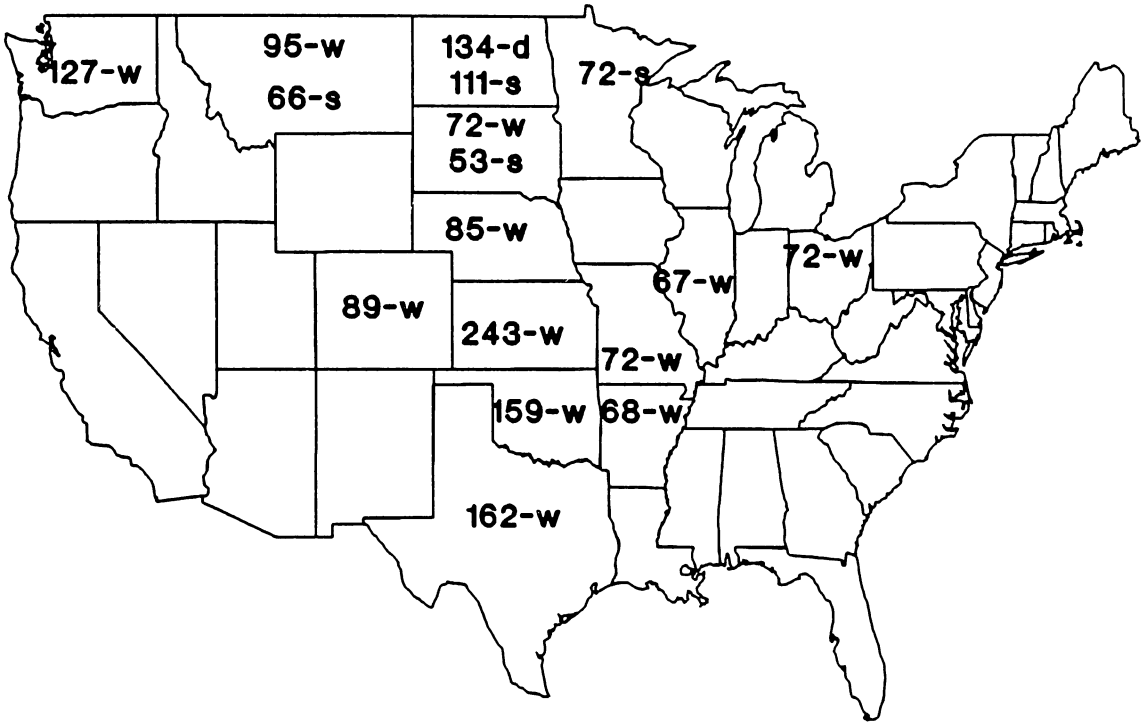
Minnesota had the highest percent of acres treated with herbicides at 99 percent. None of the four States were below 74 percent of acres treated. Herbicide application rates ranged from 0.2 pounds to 0.4 pounds per acre. Insecticides were reported but only Minnesota had significant usage. No State reported widespread use of fungicides.

North Dakota was the only State in the **durum wheat** survey. Fertilizer application practices were similar to other spring wheat grown in North Dakota. Percentage of area treated with herbicides was also similar to other spring wheat. Insecticide use was reported, but not published due to an insufficient number of reports.

Information on 21 different herbicides, 11 insecticides, and 5 fungicides were collected in the survey. Other types of chemicals were not asked as part of the wheat survey. The number of usable reports and States in the 1990 survey are shown in the U.S. map below. Survey coverage included 80 percent of the 1990 winter wheat harvested acres. Coverage of the other spring wheat and durum wheat planted acres were 94 and 87 percent, respectively.

Wheat: Number of Usable Reports, 1990

w - winter wheat; s - other spring wheat; d - durum wheat



Winter Wheat: Total Acreage and Percentage of Acreage Receiving Fertilizer Applications of Primary Plant Nutrients, Major States, 1990

State	Area Harvested	Area Receiving 1/ Nitrogen	Phosphate	Potash
	1,000 Acres	Percent		
AR	1,400	100	30	30
CO	2,550	63	17	
IL	1,900	99	89	78
KS	11,800	88	44	9
MO	2,000	96	78	83
MT	2,500	75	66	18
NE	2,250	78	21	2
OH	1,350	99	96	92
OK	6,300	91	61	10
SD	1,600	41	26	3
TX	4,200	66	35	5
WA	2,200	99	34	2
Total	40,050	83.7	47.8	18.1

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Winter Wheat: Frequency and Extent of Nitrogen Fertilizer Usage, Major States, 1990

State	Area Harvested	Area Applied 1/	Appli-cations	Rate per Application	Rate per Crop Year	Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	Million Pounds
AR	1,400	100	1.73	58	101	141
CO	2,550	63	1.24	35	43	69
IL	1,900	99	1.71	50	85	160
KS	11,800	88	1.38	36	49	509
MO	2,000	96	1.56	54	85	163
MT	2,500	75	1.53	31	47	88
NE	2,250	78	1.23	41	50	88
OH	1,350	99	1.89	40	75	100
OK	6,300	91	1.72	38	65	373
SD	1,600	41	1.22	29	35	23
TX	4,200	66	1.51	58	88	244
WA	2,200	99	1.21	56	68	148
Total	40,050	83.7	1.49	42.1	62.8	2,106

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Winter Wheat: Frequency and Extent of Phosphate Fertilizer Usage, Major States, 1990

State	Area Harvested	Area Applied 1/	Applications	Rate per Application	Rate per Crop Year	Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	Million Pounds
AR	1,400	30	1.17	35	41	17
CO	2,550	17	1.00	23	23	10
IL	1,900	89	1.05	70	74	125
KS	11,800	44	1.01	29	29	151
MO	2,000	78	1.04	50	52	81
MT	2,500	66	1.00	28	28	46
NE	2,250	21	1.00	27	27	13
OH	1,350	96	1.06	62	66	86
OK	6,300	61	1.02	33	34	131
SD	1,600	26	1.00	24	24	10
TX	4,200	35	1.00	37	37	54
WA	2,200	34	1.07	22	24	18
Total	40,050	47.8	1.02	38.0	38.8	742

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Winter Wheat: Frequency and Extent of Potash Fertilizer Usage, Major States, 1990

State	Area Harvested	Area Applied 1/	Applications	Rate per Application	Rate per Crop Year	Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	Million Pounds
AR	1,400	30	1.17	47	55	23
CO 2/	2,550					
IL	1,900	78	1.02	89	91	135
KS	11,800	9	1.00	21	21	22
MO	2,000	83	1.06	68	72	120
MT	2,500	18	1.00	17	17	8
NE 2/	2,250					
OH	1,350	92	1.06	66	70	87
OK	6,300	10	1.00	25	25	16
SD 2/	1,600					
TX 2/	4,200					
WA 2/	2,200					
Total	40,050	18.1	1.04	55.0	57.2	415

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Winter Wheat: Total Acreage and Percentage of Acreage Receiving Herbicide Applications, Major States, 1990

State	Area Harvested	Area Receiving Herbicides 1/
	1,000 Acres	Percent
AR	1,400	24
CO	2,550	27
IL	1,900	17
KS	11,800	25
MO	2,000	10
MT	2,500	83
NE	2,250	50
OH	1,350	10
OK	6,300	28
SD	1,600	51
TX	4,200	33
WA	2,200	85
Total	40,050	34.0

1/ Refers to acres receiving one or more applications of a herbicide.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Winter Wheat: Total Acreage and Percentage of Acreage Receiving Insecticide Applications, Major States, 1990

State	Area Harvested	Area Receiving Insecticides 1/
	1,000 Acres	Percent
AR	1,400	14
CO	2,550	12
IL 2/	1,900	
KS 2/	11,800	
MO 2/	2,000	
MT 2/	2,500	
NE	2,250	9
OH 2/	1,350	
OK 2/	6,300	
SD 2/	1,600	
TX	4,200	15
WA 2/	2,200	
Total	40,050	4.4

1/ Refers to acres receiving one or more applications of an insecticide.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Winter Wheat: Total Acreage and Percentage of Acreage Receiving Fungicide Applications, Major States, 1990

State	Area Harvested	Area Receiving Fungicides 1/
	1,000 Acres	Percent
AR	1,400	27
CO 2/	2,550	
IL 2/	1,900	
KS 2/	11,800	
MO 2/	2,000	
MT 2/	2,500	
NE 2/	2,250	
OH 2/	1,350	
OK 2/	6,300	
SD 2/	1,600	
TX 2/	4,200	
WA 2/	2,200	
Total	40,050	3.0

1/ Refers to acres receiving one or more applications of a fungicide.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Winter Wheat: Frequency and Extent of 2,4-D Usage, Major States, 1990

State	Area Harvested	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AR 2/	1,400					
CO	2,550	21	1.00	0.20	0.20	107
IL 2/	1,900					
KS	11,800	9	1.04	0.51	0.53	563
MO 2/	2,000					
MT	2,500	72	1.00	0.32	0.32	576
NE	2,250	42	1.00	0.38	0.38	359
OH 2/	1,350					
OK 2/	6,300					
SD	1,600	30	1.05	0.23	0.24	115
TX	4,200	10	1.09	0.38	0.41	172
WA	2,200	28	1.03	0.50	0.51	314
Total	40,050	15.6	1.02	0.37	0.38	2,397

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Winter Wheat: Frequency and Extent of Chlorsulfuron Usage, Major States, 1990

State	Area Harvested	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AR 2/	1,400					
CO 2/	2,550					
IL 2/	1,900					
KS	11,800	17	1.00	0.01	0.01	20
MO 2/	2,000					
MT 2/	2,500					
NE 2/	2,250					
OH 2/	1,350					
OK	6,300	26	1.00	0.02	0.02	33
SD 2/	1,600					
TX	4,200	11	1.00	0.02	0.02	9
WA	2,200	28	1.00	0.01	0.01	6
Total	40,050	12.6	1.00	0.01	0.01	72

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Winter Wheat: Frequency and Extent of Dicamba Usage, Major States, 1990

State	Area Harvested	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AR 2/	1,400					
CO 2/	2,550					
IL 2/	1,900					
KS	11,800	4	1.10	0.13	0.14	66
MO 2/	2,000					
MT	2,500	16	1.00	0.08	0.08	32
NE 2/	2,250					
OH 2/	1,350					
OK 2/	6,300					
SD 2/	1,600					
TX 2/	4,200					
WA 2/	2,200					
Total	40,050	3.7	1.05	0.11	0.12	175

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Winter Wheat: Frequency and Extent of MCPA Usage,
Major States, 1990

State	Area Harvested	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AR 2/	1,400					
CO 2/	2,550					
IL 2/	1,900					
KS 2/	11,800					
MO 2/	2,000					
MT 2/	2,500					
NE 2/	2,250					
OH 2/	1,350					
OK 2/	6,300					
SD 2/	1,600					
TX 2/	4,200					
WA	2,200	21	1.12	0.33	0.37	171
Total	40,050	2.5	1.05	0.38	0.40	399

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Winter Wheat: Frequency and Extent of Propiconazole Usage, Major States, 1990

State	Area Harvested	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AR	1,400	18	1.00	0.11	0.11	28
CO 2/	2,550					
IL 2/	1,900					
KS 2/	11,800					
MO 2/	2,000					
MT 2/	2,500					
NE 2/	2,250					
OH 2/	1,350					
OK 2/	6,300					
SD 2/	1,600					
TX 2/	4,200					
WA 2/	2,200					
Total	40,050	1.9	1.00	0.10	0.10	76

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Winter Wheat: Frequency and Extent of Tribenuron-methyl Usage, Major States, 1990

State	Area Harvested	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AR 2/	1,400					
CO 2/	2,550					
IL	1,900	17	1.00	0.01	0.01	3
KS 2/	11,800					
MO 2/	2,000					
MT 2/	2,500					
NE 2/	2,250					
OH 2/	1,350					
OK 2/	6,300					
SD 2/	1,600					
TX 2/	4,200					
WA	2,200	25	1.03	0.01	0.01	6
Total	40,050	3.1	1.02	0.01	0.01	12

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Winter Wheat: Frequency and Extent of Thifensulfuron Usage, Major States, 1990

State	Area Harvested	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
AR 2/	1,400					
CO 2/	2,550					
IL	1,900	17	1.00	0.01	0.01	3
KS 2/	11,800					
MO 2/	2,000					
MT 2/	2,500					
NE 2/	2,250					
OH 2/	1,350					
OK 2/	6,300					
SD 2/	1,600					
TX 2/	4,200					
WA	2,200	25	1.03	0.01	0.01	6
Total	40,050	3.1	1.02	0.01	0.01	15

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Winter Wheat: Frequency and Extent of Pesticide Usage
by Active Ingredient,
Major States, 1990

Active Ingredient	Area Applied 1/	Applications	Rate per Application	Rate per Crop Year	Total Applied
	Percent	Number	Pounds	Pounds	1,000 Pounds
2,4-D	15.6	1.02	0.37	0.38	2,397
Benomyl	*				
Bromoxynil	1.6	1.00	0.19	0.19	121
Chlorpyrifos	1.0	1.00	0.43	0.43	172
Chlorsulfuron	12.6	1.00	0.01	0.01	72
Clopyralid	*				
Dicamba	3.7	1.05	0.11	0.12	175
Diclofop-methyl	*				
Dimethoate	1.2	1.08	0.25	0.27	128
Disulfoton	1.0	1.00	0.67	0.67	269
Diuron	*				
Esfenvalerate	*				
Ethyl parathion	*				
Glyphosate	1.3	1.13	0.45	0.51	266
Imazamethabenz	*				
Malathion	*				
Mancozeb	*				
MCPA	2.5	1.05	0.38	0.40	399
Methomyl	*				
Methyl parathion	1.0	1.09	0.39	0.43	171
Metribuzin	*				
Metsulfuron-methyl	*				
Paraquat	*				
Phorate	*				
Picloram	*				
Propiconazole	1.9	1.00	0.10	0.10	76
Terbutryn	*				
Thifensulfuron	3.1	1.02	0.01	0.01	15
Thiophanate-methyl	*				
Triadimefon	*				
Triallate	*				
Tribenuron-methyl	3.1	1.02	0.01	0.01	12
Trifluralin	*				

* Applied on less than one percent of acres.
1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.

Source: Agricultural Chemical Usage Survey, National Agricultural Statistics Service, USDA.

Other Spring Wheat: Total Acreage and Percentage of Acreage Receiving Fertilizer Applications of Primary Plant Nutrients, Major States, 1990

State	Area Planted	Area Receiving 1/ Nitrogen	Phosphate	Potash
	1,000 Acres	Percent		
MN	2,800	97	88	69
MT	2,800	50	50	9
ND	8,000	68	60	19
SD	2,200	58	43	6
Total	15,800	68.4	61.0	24.3

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Other Spring Wheat: Frequency and Extent of Nitrogen Fertilizer Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Rate per Application	Rate per Crop Year	Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	Million Pounds
MN	2,800	97	1.69	49	82	223
MT	2,800	50	1.21	32	39	55
ND	8,000	68	1.43	31	44	239
SD	2,200	58	1.19	34	41	52
Total	15,800	68.4	1.44	36.6	52.7	569

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Other Spring Wheat: Frequency and Extent of Phosphate Fertilizer Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Rate per Application	Rate per Crop Year	Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	Million Pounds
MN	2,800	88	1.11	39	43	106
MT	2,800	50	1.03	29	30	42
ND	8,000	60	1.03	30	31	149
SD	2,200	43	1.00	29	29	27
Total	15,800	61.0	1.05	32.0	33.6	324

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Other Spring Wheat: Frequency and Extent of Potash Fertilizer Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Rate per Application	Rate per Crop Year	Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	Million Pounds
MN	2,800	69	1.16	29	34	66
MT 2/	2,800					
ND	8,000	19	1.05	11	12	18
SD 2/	2,200					
Total	15,800	24.3	1.10	20.6	22.7	87

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Other Spring Wheat: Total Acreage and Percentage of Acreage Receiving Herbicide Applications, Major States, 1990

State	Area Planted	Area Receiving Herbicides 1/
	1,000 Acres	Percent
MN	2,800	99
MT	2,800	85
ND	8,000	92
SD	2,200	74
Total	15,800	89.2

1/ Refers to acres receiving one or more applications of a herbicide.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Other Spring Wheat: Total Acreage and Percentage of Acreage Receiving Insecticide Applications, Major States, 1990

State	Area Planted	Area Receiving Insecticides 1/
	1,000 Acres	Percent
MN	2,800	20
MT 2/	2,800	
ND 2/	8,000	
SD 2/	2,200	
Total	15,800	6.8

1/ Refers to acres receiving one or more applications of an insecticide.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Other Spring Wheat: Frequency and Extent of 2,4-D Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
MN	2,800	34	1.08	0.46	0.50	476
MT	2,800	74	1.00	0.27	0.27	559
ND	8,000	57	1.03	0.36	0.37	1,687
SD	2,200	38	1.00	0.32	0.32	268
Total	15,800	53.4	1.03	0.34	0.35	2,990

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Other Spring Wheat: Frequency and Extent of Bromoxynil Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
MN	2,800	31	1.05	0.26	0.27	234
MT 2/	2,800					
ND 2/	8,000					
SD 2/	2,200					
Total	15,800	8.6	1.03	0.28	0.29	398

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Other Spring Wheat: Frequency and Extent of Dicamba Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
MN	2,800	8	1.00	0.07	0.07	16
MT	2,800	21	1.00	0.06	0.06	35
ND	8,000	25	1.00	0.10	0.10	200
SD	2,200	23	1.00	0.05	0.05	25
Total	15,800	21.3	1.00	0.08	0.08	276

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Other Spring Wheat: Frequency and Extent of MCPA Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Active Ingredient: Rate Per Application	Active Ingredient: Rate Per Crop Year	Active Ingredient: Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	1,000 Pounds
MN	2,800	59	1.05	0.29	0.30	496
MT 2/	2,800					
ND	8,000	35	1.08	0.31	0.34	952
SD 2/	2,200					
Total	15,800	32.4	1.06	0.30	0.32	1,660

1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.
2/ Insufficient reports to publish State level usage estimates, but reported data are included in the total.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Other Spring Wheat: Frequency and Extent of Pesticide Usage
by Active Ingredient,
Major States, 1990

Active Ingredient	Area Applied 1/	Applications	Rate per Application	Rate per Crop Year	Total Applied
	Percent	Number	Pounds	Pounds	1,000 Pounds
2,4-D	53.4	1.03	0.34	0.35	2,990
Bromoxynil	8.6	1.03	0.28	0.29	398
Carbaryl	1.6	1.15	0.82	0.94	237
Carbofuran	1.0	1.00	0.23	0.23	36
Chlorsulfuron	3.3	1.14	0.01	0.01	6
Clopyralid	2.0	1.00	0.10	0.10	32
Dicamba	21.3	1.00	0.08	0.08	276
Diclofop-methyl	3.6	1.00	0.82	0.82	467
Difenzoquat	2.9	1.00	0.61	0.61	279
Ethyl parathion	*				
Fenoxaprop-ethyl	3.3	1.00	0.08	0.08	40
Glyphosate	*				
Imazamethabenz	2.4	1.00	0.35	0.35	133
Malathion	*				
Mancozeb	*				
MCPA	32.4	1.06	0.30	0.32	1,660
Methyl parathion	3.1	1.00	0.39	0.39	190
Metsulfuron-methyl	*				
Picloram	*				
Propiconazole	1.7	1.00	0.13	0.13	36
Thifensulfuron	5.3	1.00	0.01	0.01	8
Triallate	4.3	1.00	1.01	1.01	687
Tribenuron-methyl	10.2	1.00	0.01	0.01	16
Trifluralin	5.4	1.00	0.50	0.50	424

* Applied on less than one percent of acres.
1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.

Source: Agricultural Chemical Usage Survey, National Agricultural Statistics Service, USDA.

Durum Wheat: Total Acreage and Percentage of Acreage Receiving Fertilizer Applications of Primary Plant Nutrients, Major States, 1990

State	Area Planted	Area Receiving 1/		
		Nitrogen	Phosphate	Potash
	1,000 Acres	Percent		
ND	3,100	58	56	7

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Durum Wheat: Frequency and Extent of Nitrogen Fertilizer Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Rate per Application	Rate per Crop Year	Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	Million Pounds
ND	3,100	58	1.43	24	35	63

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Durum Wheat: Frequency and Extent of Phosphate Fertilizer Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Rate per Application	Rate per Crop Year	Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	Million Pounds
ND	3,100	56	1.00	25	25	43

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Durum Wheat: Frequency and Extent of Potash Fertilizer Usage, Major States, 1990

State	Area Planted	Area Applied 1/	Applications	Rate per Application	Rate per Crop Year	Total Applied
	1,000 Acres	Percent	Number	Pounds	Pounds	Million Pounds
ND	3,100	7	1.00	8	8	2

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Durum Wheat: Total Acreage and Percentage of Acreage Receiving Herbicide Applications, Major States, 1990

State	Area Planted	Area Receiving Herbicides 1/
	1,000 Acres	Percent
ND	3,100	90

1/ Refers to acres receiving one or more applications of a herbicide.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Durum Wheat: Frequency and Extent of Pesticide Usage
by Active Ingredient,
North Dakota, 1990

Active Ingredient	Area Applied 1/	Appli-cations	Rate per Application	Rate per Crop Year	Total Applied
	Percent	Number	Pounds	Pounds	1,000 Pounds
2,4-D	50.0	1.00	0.41	0.41	636
Bromoxynil	*				
Carbaryl	*				
Carbofuran	*				
Chlorsulfuron	*				
Dicamba	24.6	1.00	0.08	0.08	62
Diclofop-methyl	5.2	1.00	0.72	0.72	116
Difenzoquat	*				
Glyphosate	*				
Imazamethabenz	*				
Malathion	*				
MCPA	34.3	1.04	0.36	0.37	390
Methyl parathion	*				
Metsulfuron-methyl	*				
Thifensulfuron	*				
Triallate	13.4	1.00	0.92	0.92	383
Tribenuron-methyl	10.4	1.07	0.01	0.01	3
Trifluralin	30.6	1.00	0.40	0.40	384

* Applied on less than one percent of acres.
1/ Refers to acres receiving one or more applications of a specific pesticide active ingredient.

Source: Crop Production 1990 Summary and Agricultural Chemical Usage Survey National Agricultural Statistics Service, USDA.

Data Reliability

The probability nature of the survey allows expansion of data so that the estimates are statistically representative of chemical use on the targeted crops in the surveyed States. However, a complete census may have yielded different results. The reliability of these survey results are affected by sampling variability and non-sampling errors.

The variability due to sampling was computed for all the chemical and acreage variables in the survey, and is expressed as a percentage. To interpret its meaning, imagine that the survey is repeated many times using the same sample size. For every two out of three times the survey is repeated, the results would not differ from those published here by more than the stated sampling variability.

Sampling variability of the estimates differed considerably by chemical. In general, the more often the chemical was applied, the smaller the sampling variability. Regional estimates were less variable than those for individual States. The following tables show the range of sampling variability for percent of acres treated and for application rate, at both the individual State level and for multi-State regions or U.S. level totals.

The variability ranges in the tables can be used to calculate approximate confidence bands for figures in the data tables of the report. For example, if a figure in the report is 30 percent of acres treated, the confidence band for a State with a small sample size would be 30 - .2*30 to 30 + .2*30 or 24 to 36 percent. For a State with a large sample size the confidence band would be 30 - .1*30 to 30 + .1*30 or 27 to 33 percent. The U.S. level band for the same percentage would be 30 - .05*30 to 30 + .05*30 or 28.5 to 31.5 percent. Because of the larger sample sizes in Indiana and Iowa their reliabilities approximate the region level.

SAMPLING VARIABILITY FOR FERTILIZER

PERCENT OF ACRES TREATED	SAMPLING VARIABILITY % ACRES TREATED STATE	% ACRES TREATED REGION	APPLICATION RATE STATE	APPLICATION RATE REGION
LESS THAN 10	25-40%	25-30%	20-45%	20-25%
10 - 25	15-25%	5-10%	5-25%	5-15%
25 - 50	10-20%	<5%	5-15%	<5%
50 - 75	5-10%	<5%	5-10%	<5%
75 OR MORE	<5%	<5%	<5%	<5%

SAMPLING VARIABILITY FOR INDIVIDUAL PESTICIDES

PERCENT OF ACRES TREATED	SAMPLING VARIABILITY % ACRES TREATED STATE	% ACRES TREATED REGION	APPLICATION RATE STATE	APPLICATION RATE REGION
LESS THAN 10	30-100%	10-100%	5-65%	10-100%
10 - 25	15-25%	5-10%	5-15%	5-10%
25 - 50	10-20%	5-10%	5-10%	<5%
50 - 75	5-10%	<5%	<5%	<5%
75 OR MORE	<5%	<5%	<5%	<5%

Non-sampling errors are errors that 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 between the collection and publication. In these surveys, all survey procedures and analysis were carried out in a consistent and orderly manner to minimize the occurrence of these type of errors.

Terms and Definitions

Agricultural chemicals are defined as both fertilizer and pesticide products. A **fertilizer** is any organic or inorganic material of natural or synthetic origin which is added to soil or plant material to provide one or more plant nutrients. **Pesticides** are referred to as any chemical that inhibits any organism from injuring plants or plant products. Insecticides, fungicides, miticides, nematicides, and soil fumigants are obvious pesticide products. However, herbicides, growth regulators, defoliants, and desiccants are also considered as pesticide products in this publication.

Plant nutrients as far as this publication is concerned refer to nitrogen, phosphate, and potash that are essential for normal plant growth. **Active ingredient** is the specific chemical contained in a pesticide product that reacts with the soil, plant, or pest to give a desired effect. **Trade name** is the actual product name given to a specific formulation of a fertilizer or pesticide product. The formulation can contain one or more active ingredients.

Rate per application refers to the average number of pounds of plant nutrient or active ingredient applied to an acre of land in one application. The **rate per crop year** is the average number of pounds of plant nutrient or active ingredient applied to one acre of land taking into account multiple applications.

Pesticides: Common Names of Active Ingredients and Trade Names

The following is a list of common names of active ingredients with the associated trade names. The list is provided as an aid in reviewing pesticide data. Pre-mixes are not listed. The list is not complete and NASS does not mean to imply use of any specific trade name.

FUNGICIDES:

Common Name	Trade Name
anilazine	Dyrene
basic copper sulfate	Top Cop
benomyl	Benlate
chlorothalonil	Bravo
copper hydroxide	Champion, Kocide
DCNA	Botran
iprodione	Rovral
mancozeb	several
maneb	several
metalaxyl	Ridomil
metiram	Polyram
PCNB	Terraclor
propiconazole	Tilt
sulfur	Thiolux
thiophanate-methyl	Topsin M
triadimefon	Bayleton
triphenyltin hydroxide	several

HERBICIDES:

Common Name	Trade Name
2,4-D	several
2,4-DB	Butoxone, Butyrac
acifluorfen	Blazer, Tackle
alachlor	Lasso
ametryn	Evik
atrazine	AAtrex
barban	Carbyne
bensulfuron-methyl	Londax
bentazon	Basagran
bromoxynil	Brominal, Buctril
butylate	Genate Plus, Sutan
chloramben	Amiben
chlorimuron-ethyl	Classic
chlorpropham	Furloe
chlorsulfuron	Glean
clomazone	Command
clopyralid	Curtail
cyanazine	Bladex
dalapon	Dalapon, Dowpon
DCPA	Dacthal
diallate	Avadex

HERBICIDES: (con't)

Common Name	Trade Name
dicamba	Banvel
diclofop-methyl	Hoelon
difenzoquat	Avenge
diuron	Direx, Karmex
DSMA	several
EPTC	Eptam, Eradicane, Genep
ethalfluralin	Sonalan
fenoxaprop-ethyl	Option, Whip
fluazifop-P-butyl	Fusilade
fluometuron	Cotoran, Meturon
fomesafen	Reflex
glyphosate	Honcho, Ranger, Roundup
imazamethabenz	Assert
imazaquin	Scepter, Tri-Scept
imazethapyr	Pursuit
lactofen	Cobra
linuron	Linex, Lorox
MCPA	several
methazole	Probe
metolachlor	Dual
metribuzin	Lexone, Sencor
metsulfuron-methyl	Ally
molinate	Ordram
MSMA	several
naptalam	Alanap
norflurazon	Zorial
oryzalin	Surflan
oxyfluorfen	Goal
paraquat	Gramoxone
pendimethalin	Prowl
picloram	Tordon
primisulfuron	Beacon
prometryn	Caparol, Cotton-Pro
propachlor	Ramrod
propanil	Prop-Job, Stam M
quizalofop-ethyl	Assure
sethoxydim	Poast
simazine	Princep
terbutryn	Igran
thifensulfuron	Harmony, Pinnacle
thiobencarb	Bolero
triallate	Far-Go
tribenuron-methyl	Express
triclopyr	Rely
tridiphane	Tandem
trifluralin	Treflan, Trilin, TRI-4
vernolate	Reward, Surpass, Vernam

Pesticides: Common Names of Active Ingredients and Trade Names

INSECTICIDES:

Common Name	Trade Name
acephate	Orthene
aldicarb	Temik
azinphos-methyl	Guthion
bifenthrin	Capture
Bt (Bacillus thur.)	Dipel, Trident, M-One
carbaryl	Sevin, Savit
carbofuran	Furadan
chlorpyrifos	Lorsban
cryolite	Kryocide
diazinon	several
dichloropropene	Telone
diflubenzuron	Dimilin
dimethoate	several
disulfoton	Di-Syston
endosulfan	Thiodan
esfenvalerate	Pydrin, Asana
ethoprop	Mocap
ethyl parathion	several
fensulfothion	Dasanit
flucythrinate	AAStar
fonofos	Dyfonate
malathion	several
metam-sodium	Vapam
methamidophos	Monitor
methomyl	Lannate, Nudrin
methoxychlor	several
methyl parathion	several
mevinphos	Phosdrin
oxamyl	Vydate
oxydemeton-methyl	Metasystox-R
permethrin	Ambush, Pounce
phorate	Thimet
phosmet	Imidan
phosphamidon	Phosphamidon
propargite	Omite, Comite
rotenone	Rotenone
tefluthrin	Force
terbufos	Counter
thiodicarb	Larvin
tralomethrin	Scout
trimethacarb	Broot

Pesticides: Common Names of Active Ingredients and Trade Names

OTHER:

Common Name	Trade Name
ametryn	Evik
diquat	Diquat
endothall	Des-i-cate
maleic hydrazide	Royal MH-30, Super Sprout Stop
paraquat	Gramoxone
sodium chlorate	several
sulfuric acid	several

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NOTICE

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The next issue of the **Agricultural Chemical Usage** report will be released on **June 25, 1991**. It will include chemical application rates and acres treated for vegetables in AZ, CA, FL, MI, and TX.

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