United States
Department of
Agriculture

National
Agricultural
Statistics
Service

# Agricultural Chemical Usage
## 2002 Field Crops Summary

## May 2003

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## Table of Contents

## Overview

The agricultural chemical use estimates in this report refer to on-farm use of commercial fertilizers and pesticides on targeted crops for the 2002 crop year. Farm and ranch operators were enumerated late in the growing season after the farm operator had indicated that planned applications were completed. The chemical use data were not summarized for geographical areas other than published in this report.

The data were compiled from the Agricultural Resources Management Survey (ARMS) and from the Objective Yield Survey, with the main portion of data collection being conducted during the months of October-December of 2002. Relevant portions of the survey instruments used in data collection are included in the back of this publication.

Targeted crops from the 2002 Objective Yield Survey included corn and durum, other spring, and winter wheat. Soybeans was the target crop from the ARMS.

**Agricultural Chemical Use Survey Coverage, 2002**

| Crop | 2002 | | |
|---|---|---|---|
| | States Surveyed | Reports Summarized | U.S. Acreage Incl. |
| | - Number -- | | Percent |
| Corn | 7 | 1,250 | 65 |
| Soybeans | 20 | 2,526 | 97 |
| Wheat, Durum | 1 | 75 | 72 |
| Wheat, Other Spring | 3 | 353 | 81 |
| Wheat, Winter (Harvested) | 10 | 1,006 | 75 |

This report excludes pesticides used for seed treatments and postharvest applications to the commodity. Spot treatments, which account for a very small percentage of total applications, are also excluded.

## Highlights

**Corn:** Nitrogen was applied to 96 percent of the 2002 corn planted acreage in the Program States: Illinois, Indiana, Iowa, Minnesota, Nebraska, Ohio, and Wisconsin. Nitrogen applications ranged from 94 percent of the acreage treated in Illinois and Iowa to 99 percent in Indiana and Ohio. Corn growers used an average of 1.7 applications per acre while applying 83 pounds of nitrogen per treatment. This computes to a crop year rate per acre of 137 pounds per acre. In the Program States, 79 percent of the corn planted acreage received a phosphate application, while potash was applied to 68 percent of the planted acreage.

Herbicides were applied to 89 percent of the corn planted acreage in 2002. Atrazine continued to be the most widely applied herbicide with 62 percent of the planted acreage being treated. It was applied at a rate of 1.04 pounds per acre. Acetochlor, S-Metolachlor, and Nicosulfuron were the next three most widely applied herbicides with 25, 15, and 13 percent of the planted corn acreage treated respectively.

In 2002, 24 percent of the corn planted acreage was treated with insecticides. Tefluthrin was the most widely applied insecticide, with 6 percent of the planted corn acreage treated in the Program States.

**Soybeans:** Producers in the Program States (Arkansas, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Michigan, Minnesota, Mississippi, Missouri, Nebraska, North Carolina, North Dakota, Ohio, South Dakota, Tennessee, Virginia, and Wisconsin) applied nitrogen fertilizer to 20 percent of the soybean planted acreage. The percent of acres treated ranged from 2 percent in Louisiana to 64 percent in North Dakota. The average number of nitrogen applications per acre was 1.1 with an average application rate of 19 pounds per acre. Phosphate was applied on 26 percent of the soybean planted acreage in the Program States. Producers in North Dakota applied phosphate to a high of 59 percent of the soybean planted acreage, whereas Iowa producers applied phosphate to a low of only 7 percent of the planted acreage. Potash was applied to 29 percent of the planted soybean planted acreage in the Program States.

In the Program States, 99 percent of the soybean planted acreage was treated with herbicides. The most widely used herbicides were Glyphosate; applied to 78 percent of the soybean acreage, followed by Imazethapyr and Pendimethalin; each applied to 9 percent of the acreage, and Trifluralin; applied to 7 percent of the planted acreage. Chlorimuron-ethyl and Sulfentrazone were both applied to 6 percent of the soybean planted acreage.

Producers in the Program States applied insecticides to 6 percent of the soybean planted acres. Louisiana producers applied insecticides to 72 percent of the planted acreage followed by Virginia at 46 percent of the planted acreage. Fungicides were applied to less than 1 percent of the soybean planted acreage in the Program States.

**Durum Wheat:** Nitrogen fertilizer was applied to 88 percent of the 2002 North Dakota planted acreage. Fertilizers with phosphate were applied to 58 percent of the planted acreage and 5 percent of the planted acreage received potash applications. North Dakota producers treated 100 percent of the durum wheat planted acreage with herbicides; 2,4-D was applied to 55 percent of the planted acreage followed by MCPA, Fenoxaprop, and Dicamba at 36, 22, and 21 percent respectively.

**Other Spring Wheat:** Nitrogen was applied to 86 percent of the 2002 other spring wheat planted acreage in the Program States: Minnesota, Montana, and North Dakota. Phosphate was applied to 74 percent of the planted acreage while potash was applied to 27 percent of the planted acreage in the Program States. Spring wheat producers treated 91 percent of the other spring wheat planted acreage with herbicides; MCPA was applied to 47 percent of the planted acreage followed by 2,4-D at 36 percent.

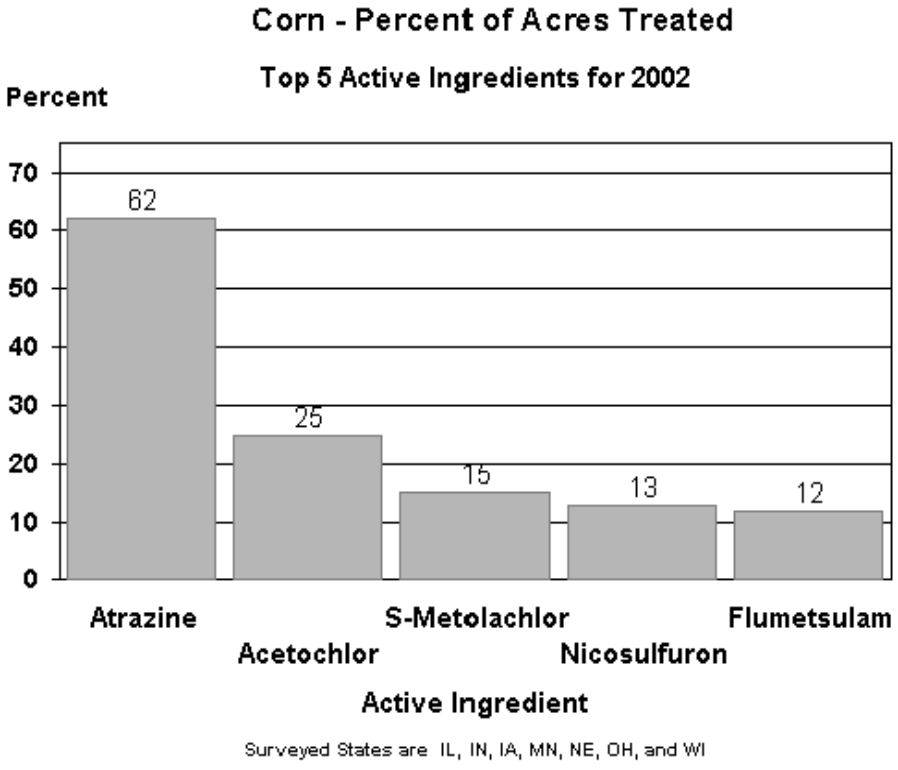
**Winter Wheat:** Nitrogen was applied to 86 percent of the 2002 winter wheat harvested acreage in the Program States: Colorado, Illinois, Kansas, Missouri, Montana, Nebraska, Ohio, Oklahoma, Texas, and Washington. Winter wheat producers applied 68 pounds of nitrogen per acre for the crop year.

In the Program States, 55 percent of the harvested winter wheat acreage received phosphate while potash was applied to 15 percent of the harvested acreage.

Herbicides were applied to 38 percent of the 2002 winter wheat harvested acreage in the Program States. Metsulfuron-methyl and 2,4-D were both applied to 13 percent of the winter wheat harvested acreage followed by Chlorsulfuron at 10 percent.

Producers in the Program States treated 11 percent of the winter wheat harvested acreage with insecticides. Zeta-cypermethrin was applied to 4 percent of the winter wheat harvested acreage while Chlorpyrifos, and Dimethoate were applied to 3 percent of the harvested acres.

## Corn: Number of Usable Reports, 2002

## Corn: Fertilizer Use by State, 2002
## Percent of Acres Treated and Total Amount Applied

| State | Planted Acreage | Percent of Acres Treated and Total Applied | | | | | |
|---|---|---|---|---|---|---|---|
| | | Nitrogen | | Phosphate | | Potash | |
| | *1,000 Acres* | *Pct* | *Mil. Lbs* | *Pct* | *Mil. Lbs* | *Pct* | *Mil. Lbs* |
| IL | 11,200 | 94 | 1,698.3 | 77 | 754.1 | 77 | 1,028.7 |
| IN | 5,400 | 99 | 786.7 | 92 | 350.4 | 84 | 567.1 |
| IA | 12,300 | 94 | 1,408.0 | 72 | 515.8 | 69 | 607.4 |
| MN | 7,200 | 95 | 839.9 | 86 | 330.1 | 78 | 344.8 |
| NE | 8,400 | 97 | 1,195.5 | 70 | 220.3 | 21 | 32.3 |
| OH | 3,200 | 99 | 500.1 | 85 | 183.2 | 78 | 283.1 |
| WI | 3,650 | 98 | 325.0 | 87 | 102.2 | 88 | 202.2 |
| Total | 51,350 | 96 | 6,753.5 | 79 | 2,456.1 | 68 | 3,065.6 |

## Corn: Fertilizer Primary Nutrient Applications, Program States and Total, 2002

| Primary Nutrient | Planted Acreage | Area Applied | Applic-ations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|---|
| | *1,000 Acres* | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *Mil. Lbs* |
| Illinois | 11,200 | | | | | |
| Nitrogen | | 94 | 1.6 | 99 | 161 | 1,698.3 |
| Phosphate | | 77 | 1.0 | 83 | 87 | 754.1 |
| Potash | | 77 | 1.0 | 115 | 119 | 1,028.7 |
| Indiana | 5,400 | | | | | |
| Nitrogen | | 99 | 1.8 | 78 | 148 | 786.7 |
| Phosphate | | 92 | 1.2 | 55 | 70 | 350.4 |
| Potash | | 84 | 1.0 | 116 | 125 | 567.1 |
| Iowa | 12,300 | | | | | |
| Nitrogen | | 94 | 1.3 | 88 | 122 | 1,408.0 |
| Phosphate | | 72 | 1.0 | 56 | 58 | 515.8 |
| Potash | | 69 | 1.0 | 70 | 71 | 607.4 |
| Minnesota | 7,200 | | | | | |
| Nitrogen | | 95 | 1.5 | 77 | 122 | 839.9 |
| Phosphate | | 86 | 1.1 | 48 | 53 | 330.1 |
| Potash | | 78 | 1.0 | 56 | 61 | 344.8 |
| Nebraska | 8,400 | | | | | |
| Nitrogen | | 97 | 1.8 | 79 | 146 | 1,195.5 |
| Phosphate | | 70 | 1.1 | 33 | 37 | 220.3 |
| Potash | | 21 | 1.1 | 16 | 18 | 32.3 |
| Ohio | 3,200 | | | | | |
| Nitrogen | | 99 | 2.0 | 76 | 158 | 500.1 |
| Phosphate | | 85 | 1.1 | 57 | 67 | 183.2 |
| Potash | | 78 | 1.1 | 98 | 113 | 283.1 |
| Wisconsin | 3,650 | | | | | |
| Nitrogen | | 98 | 1.7 | 52 | 91 | 325.0 |
| Phosphate | | 87 | 1.0 | 31 | 32 | 102.2 |
| Potash | | 88 | 1.1 | 54 | 63 | 202.2 |
| Total | 51,350 | | | | | |
| Nitrogen | | 96 | 1.7 | 83 | 137 | 6,753.5 |
| Phosphate | | 79 | 1.1 | 54 | 60 | 2,456.1 |
| Potash | | 68 | 1.1 | 80 | 85 | 3,065.6 |

## Corn: Active Ingredients and Publication Status By Program States, 2002

| Active Ingredient | Program States | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | ALL | IL | IN | IA | MN | NE | OH | WI |
| Herbicides | | | | | | | | |
| 2,4-D | P | P | * | P | * | P | P | P |
| Acetamide | P | * | P | P | * | P | | |
| Acetic acid | P | * | * | * | * | | * | |
| Acetochlor | P | P | P | P | P | P | P | P |
| Alachlor | P | * | * | | * | P | * | * |
| Atrazine | P | P | P | P | P | P | P | P |
| Bentazon | * | | * | * | | | | |
| Bromoxynil | P | * | * | P | P | * | | * |
| Butoxy. ester 2,4-D | * | | | * | | | * | |
| Carfentrazone-ethyl | P | * | * | * | * | P | * | * |
| Clethodim | * | | * | | | | | |
| Clopyralid | P | P | P | P | P | P | * | P |
| Colleto. gloeospor. | * | | | * | | | | |
| Cyanazine | P | * | | | | * | * | |
| Dicamba | P | P | P | P | P | P | P | P |
| Dicamba, Dimet. salt | P | P | P | P | P | P | P | * |
| Dicamba, Pot. salt | P | P | * | P | P | P | * | P |
| Dicamba, Sodium Salt | P | P | | * | * | | * | |
| Diflufenzopyr-sodium | P | P | * | P | P | P | P | * |
| Dimethenamid | P | P | P | P | P | P | P | * |
| Dimethenamid-P | P | * | | P | P | | * | * |
| EPTC | P | | | * | * | | | |
| Flumetsulam | P | P | P | P | P | P | P | P |
| Flumiclorac-pentyl | * | | | * | | | | |
| Foramsulfuron | P | * | | * | P | * | | * |
| Glufosinate-ammonium | P | * | * | P | P | * | | * |
| Glyphosate | P | P | P | P | P | P | P | P |
| Glyphosate diam salt | * | | | | | * | * | * |
| Halosulfuron | P | | | * | | * | * | * |
| Imazapyr | P | P | P | * | | * | | * |
| Imazethapyr | P | P | P | * | | * | | * |
| Isoxaflutole | P | P | P | P | | P | P | |
| Mesotrione | P | P | * | P | P | P | | * |
| Metolachlor | P | P | P | P | * | P | P | * |
| Metribuzin | P | | * | * | * | * | | |
| Nicosulfuron | P | P | P | P | P | P | P | P |
| Paraquat | P | * | * | | | | * | |
| Pendimethalin | P | * | * | | * | | * | P |
| Primisulfuron | P | P | P | P | P | P | * | * |
| Prosulfuron | P | * | * | | | P | | |
| Pyridate | * | * | | | | * | | |
| Rimsulfuron | P | P | * | P | P | P | * | P |
| S-Metolachlor | P | P | P | P | P | P | P | P |
| Simazine | P | P | * | | * | | P | |
| Sulfosate | * | * | * | * | | | | |
| Thifensulfuron | * | | | | * | * | | * |
| Trifluralin | * | | | | | * | | |

See footnote(s) at end of table. --continued

## Corn: Active Ingredients and Publication Status By Program States, 2002

| Active Ingredient | Program States | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | ALL | IL | IN | IA | MN | NE | OH | WI |
| Insecticides | | | | | | | | |
| Bifenthrin | P | * | * | P | * | P | * | |
| Bt (Bacillus thur.) | * | | | | | * | | |
| Carbaryl | * | | * | | | | | |
| Carbofuran | P | * | | | | * | | * |
| Chlorethoxyfos | * | * | * | | | | | |
| Chlorpyrifos | P | P | P | P | * | P | * | P |
| Cyfluthrin | P | P | P | * | * | P | * | * |
| Dimethoate | P | | | | | P | | |
| Esfenvalerate | * | * | | | | * | | |
| Ethoprop | * | | * | | | | | |
| Fipronil | P | * | P | * | * | P | * | * |
| Fonofos | * | | | | | | | * |
| Lambda-cyhalothrin | P | P | * | * | | * | | |
| Methyl parathion | P | * | | | | * | | |
| Permethrin | P | * | * | * | | P | P | * |
| Phorate | * | | | | | | * | * |
| Spinosad | * | | | * | | | | |
| Tebupirimphos | P | P | P | * | * | P | * | * |
| Tefluthrin | P | P | P | P | * | P | * | * |
| Terbufos | P | P | * | * | * | P | * | * |
| Zeta-cypermethrin | P | * | | | | * | * | |
| Fungicides | | | | | | | | |
| Mancozeb | * | | | | | * | | |
| Propiconazole | * | | | * | | | | |

P Usage data are published for this active ingredient.
* Usage data are not published for this active ingredient.

## Corn: Pesticide, Planted Acreage, Percent of Area Receiving Applications and Total Applied, Program States and Total, 2002

| State | Planted Acreage | Area Receiving and Total Applied | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Herbicide | | Insecticide [1] | | Fungicide | | Other | |
| | *1,000 Acres* | *Pct* | *1,000 Lbs* | *Pct* | *1,000 Lbs* | *Pct* | *1,000 Lbs* | *Pct* | *1,000 Lbs* |
| IL | 11,200 | 90 | 25,157 | 36 | 1,088 | | | | |
| IN | 5,400 | 90 | 11,535 | 39 | 729 | | | | |
| IA [2] | 12,300 | 91 | 22,485 | 12 | 432 | | | | |
| MN | 7,200 | 96 | 10,002 | 6 | 212 | | | | |
| NE [2] | 8,400 | 83 | 12,869 | 38 | 986 | | | | |
| OH | 3,200 | 91 | 8,424 | 14 | 125 | | | | |
| WI | 3,650 | 81 | 5,304 | 20 | 356 | | | | |
| Total [2] | 51,350 | 89 | 95,777 | 24 | 3,931 | | | | |

[1] Total Applied excludes Bt's (Bacillus thuringiensis) and other biologicals. Quantities are not available because amounts of active ingredient are not comparable between products.
[2] Insufficient reports to publish data for one or more pesticide classes.

## Corn: Agricultural Chemical Applications, Program States, 2002 [1]

| Active Ingredient | Area Applied | Appli-cations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| 2,4-D | 4 | 1.0 | 0.45 | 0.45 | 1,018 |
| Acetamide | 2 | 1.0 | 0.39 | 0.39 | 488 |
| Acetic acid | * | 1.0 | 0.39 | 0.39 | 152 |
| Acetochlor | 25 | 1.0 | 1.73 | 1.74 | 22,556 |
| Alachlor | 1 | 1.0 | 2.16 | 2.16 | 1,281 |
| Atrazine | 62 | 1.0 | 1.04 | 1.12 | 35,762 |
| Bromoxynil | 2 | 1.0 | 0.29 | 0.29 | 272 |
| Carfentrazone-ethyl | 2 | 1.0 | 0.01 | 0.01 | 10 |
| Clopyralid | 11 | 1.0 | 0.10 | 0.10 | 577 |
| Cyanazine | * | 1.0 | 0.81 | 0.81 | 132 |
| Dicamba | 11 | 1.0 | 0.20 | 0.20 | 1,129 |
| Dicamba, Dimet. salt | 6 | 1.0 | 0.11 | 0.12 | 340 |
| Dicamba, Pot. salt | 5 | 1.0 | 0.37 | 0.37 | 933 |
| Dicamba, Sodium Salt | * | 1.0 | 0.13 | 0.13 | 50 |
| Diflufenzopyr-sodium | 6 | 1.0 | 0.05 | 0.05 | 143 |
| Dimethenamid | 7 | 1.0 | 1.11 | 1.11 | 4,186 |
| Dimethenamid-P | 2 | 1.0 | 0.76 | 0.76 | 684 |
| EPTC | * | 1.0 | 3.59 | 3.59 | 1,299 |
| Flumetsulam | 12 | 1.0 | 0.04 | 0.04 | 268 |
| Foramsulfuron | * | 1.0 | 0.03 | 0.03 | 13 |
| Glufosinate-ammonium | 3 | 1.0 | 0.31 | 0.32 | 533 |
| Glyphosate | 9 | 1.1 | 0.64 | 0.71 | 3,307 |
| Halosulfuron | * | 1.0 | 0.03 | 0.03 | 9 |
| Imazapyr | 1 | 1.0 | 0.002 | 0.002 | 2 |
| Imazethapyr | 1 | 1.0 | 0.007 | 0.007 | 5 |
| Isoxaflutole | 9 | 1.0 | 0.07 | 0.07 | 331 |
| Mesotrione | 8 | 1.0 | 0.09 | 0.09 | 367 |
| Metolachlor | 8 | 1.0 | 1.52 | 1.54 | 6,589 |
| Metribuzin | * | 1.0 | 0.10 | 0.10 | 39 |
| Nicosulfuron | 13 | 1.0 | 0.02 | 0.02 | 131 |
| Paraquat | * | 1.0 | 0.59 | 0.59 | 136 |
| Pendimethalin | 1 | 1.0 | 1.20 | 1.20 | 777 |
| Primisulfuron | 5 | 1.0 | 0.02 | 0.02 | 52 |
| Prosulfuron | 2 | 1.0 | 0.009 | 0.009 | 10 |
| Rimsulfuron | 11 | 1.0 | 0.01 | 0.01 | 62 |
| S-Metolachlor | 15 | 1.0 | 1.33 | 1.33 | 10,230 |
| Simazine | 3 | 1.0 | 1.04 | 1.04 | 1,583 |

See footnote(s) at end of table.

--continued

## Corn: Agricultural Chemical Applications, Program States, 2002 [1]

| Active Ingredient | Area Applied | Appli-cations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Insecticides | | | | | |
| Bifenthrin | 2 | 1.0 | 0.06 | 0.06 | 59 |
| Carbofuran | * | 1.0 | 0.93 | 0.93 | 176 |
| Chlorpyrifos | 3 | 1.0 | 0.94 | 0.96 | 1,581 |
| Cyfluthrin | 4 | 1.0 | 0.006 | 0.006 | 11 |
| Dimethoate | * | 1.0 | 0.42 | 0.42 | 125 |
| Fipronil | 3 | 1.0 | 0.11 | 0.11 | 157 |
| Lambda-cyhalothrin | 2 | 1.0 | 0.02 | 0.02 | 17 |
| Methyl parathion | * | 1.0 | 0.53 | 0.53 | 99 |
| Permethrin | 2 | 1.0 | 0.10 | 0.10 | 83 |
| Tebupirimphos | 4 | 1.0 | 0.11 | 0.11 | 228 |
| Tefluthrin | 6 | 1.0 | 0.11 | 0.11 | 334 |
| Terbufos | 1 | 1.0 | 1.08 | 1.08 | 812 |
| Zeta-cypermethrin | * | 1.0 | 0.03 | 0.03 | 8 |

* Area applied is less than one percent.

[1] Planted acres in 2002 for the 7 program states were 51.4 million acres. States included are IL, IN, IA, MN, NE, OH and WI.

## Corn: Agricultural Chemical Applications, Illinois, 2002 [1]

| Active Ingredient | Area Applied | Appli-cations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| 2,4-D | 5 | 1.0 | 0.53 | 0.53 | 289 |
| Acetochlor | 23 | 1.0 | 1.88 | 1.91 | 4,890 |
| Atrazine | 72 | 1.1 | 1.20 | 1.36 | 11,002 |
| Clopyralid | 5 | 1.0 | 0.10 | 0.10 | 54 |
| Dicamba | 9 | 1.0 | 0.16 | 0.16 | 151 |
| Dicamba, Dimet. salt | 5 | 1.0 | 0.10 | 0.10 | 60 |
| Dicamba, Pot. salt | 9 | 1.0 | 0.43 | 0.43 | 429 |
| Dicamba, Sodium Salt | 2 | 1.0 | 0.14 | 0.14 | 26 |
| Diflufenzopyr-sodium | 7 | 1.0 | 0.04 | 0.04 | 33 |
| Dimethenamid | 14 | 1.0 | 1.09 | 1.09 | 1,651 |
| Flumetsulam | 5 | 1.0 | 0.05 | 0.05 | 29 |
| Glyphosate | 4 | 1.1 | 0.62 | 0.72 | 364 |
| Imazapyr | 2 | 1.0 | 0.002 | 0.002 | ( [2] ) |
| Imazethapyr | 2 | 1.0 | 0.007 | 0.007 | 1 |
| Isoxaflutole | 10 | 1.0 | 0.08 | 0.08 | 86 |
| Mesotrione | 11 | 1.0 | 0.10 | 0.10 | 121 |
| Metolachlor | 11 | 1.0 | 1.57 | 1.57 | 1,848 |
| Nicosulfuron | 11 | 1.0 | 0.02 | 0.02 | 27 |
| Primisulfuron | 4 | 1.0 | 0.03 | 0.03 | 10 |
| Rimsulfuron | 8 | 1.0 | 0.01 | 0.01 | 10 |
| S-Metolachlor | 16 | 1.0 | 1.42 | 1.42 | 2,488 |
| Simazine | 5 | 1.0 | 1.04 | 1.04 | 601 |
| Insecticides | | | | | |
| Chlorpyrifos | 3 | 1.0 | 1.43 | 1.43 | 444 |
| Cyfluthrin | 8 | 1.0 | 0.006 | 0.006 | 5 |
| Lambda-cyhalothrin | 5 | 1.0 | 0.02 | 0.02 | 13 |
| Tebupirimphos | 8 | 1.0 | 0.11 | 0.11 | 96 |
| Tefluthrin | 12 | 1.0 | 0.11 | 0.11 | 149 |
| Terbufos | 2 | 1.0 | 1.01 | 1.01 | 208 |

[1] Planted acres in 2002 for Illinois were 11.2 million acres.
[2] Total applied is less than 1,000 lbs.

## Corn: Agricultural Chemical Applications, Indiana, 2002 [1]

| Active Ingredient | Area Applied | Appli-cations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| Acetamide | 5 | 1.0 | 0.45 | 0.45 | 120 |
| Acetochlor | 23 | 1.0 | 1.90 | 1.90 | 2,324 |
| Atrazine | 78 | 1.0 | 1.26 | 1.32 | 5,547 |
| Clopyralid | 7 | 1.0 | 0.10 | 0.10 | 37 |
| Dicamba | 6 | 1.0 | 0.12 | 0.12 | 40 |
| Dicamba, Dimet. salt | 4 | 1.0 | 0.10 | 0.10 | 21 |
| Dimethenamid | 4 | 1.0 | 1.22 | 1.22 | 254 |
| Flumetsulam | 10 | 1.0 | 0.09 | 0.09 | 52 |
| Glyphosate | 6 | 1.0 | 0.63 | 0.63 | 219 |
| Imazapyr | 5 | 1.0 | 0.002 | 0.002 | 1 |
| Imazethapyr | 5 | 1.0 | 0.007 | 0.007 | 2 |
| Isoxaflutole | 13 | 1.0 | 0.06 | 0.06 | 42 |
| Metolachlor | 6 | 1.0 | 1.61 | 1.61 | 538 |
| Nicosulfuron | 8 | 1.0 | 0.02 | 0.02 | 8 |
| Primisulfuron | 4 | 1.0 | 0.03 | 0.03 | 5 |
| S-Metolachlor | 22 | 1.0 | 1.23 | 1.23 | 1,467 |
| Insecticides | | | | | |
| Chlorpyrifos | 6 | 1.0 | 0.87 | 0.87 | 291 |
| Cyfluthrin | 8 | 1.0 | 0.006 | 0.006 | 2 |
| Fipronil | 7 | 1.0 | 0.13 | 0.13 | 48 |
| Tebupirimphos | 8 | 1.0 | 0.11 | 0.11 | 47 |
| Tefluthrin | 10 | 1.0 | 0.13 | 0.13 | 66 |

[1] Planted acres in 2002 for Indiana were 5.40 million acres.

## Corn: Agricultural Chemical Applications, Iowa, 2002 [1]

| Active Ingredient | Area Applied | Appli-cations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| 2,4-D | 4 | 1.0 | 0.44 | 0.44 | 244 |
| Acetamide | 3 | 1.0 | 0.43 | 0.43 | 160 |
| Acetochlor | 29 | 1.0 | 1.74 | 1.74 | 6,128 |
| Atrazine | 60 | 1.0 | 0.94 | 0.99 | 7,287 |
| Bromoxynil | 3 | 1.0 | 0.25 | 0.25 | 80 |
| Clopyralid | 14 | 1.0 | 0.10 | 0.11 | 184 |
| Dicamba | 11 | 1.0 | 0.17 | 0.17 | 225 |
| Dicamba, Dimet. salt | 8 | 1.0 | 0.12 | 0.13 | 133 |
| Dicamba, Pot. salt | 4 | 1.0 | 0.31 | 0.31 | 168 |
| Diflufenzopyr-sodium | 8 | 1.0 | 0.05 | 0.05 | 53 |
| Dimethenamid | 8 | 1.0 | 1.16 | 1.16 | 1,088 |
| Dimethenamid-P | 2 | 1.0 | 0.79 | 0.79 | 216 |
| Flumetsulam | 14 | 1.0 | 0.04 | 0.04 | 70 |
| Glufosinate-ammonium | 5 | 1.0 | 0.32 | 0.32 | 211 |
| Glyphosate | 8 | 1.1 | 0.60 | 0.69 | 715 |
| Isoxaflutole | 15 | 1.0 | 0.08 | 0.08 | 147 |
| Mesotrione | 12 | 1.0 | 0.08 | 0.08 | 119 |
| Metolachlor | 11 | 1.0 | 1.83 | 1.83 | 2,519 |
| Nicosulfuron | 14 | 1.0 | 0.02 | 0.02 | 31 |
| Primisulfuron | 5 | 1.0 | 0.02 | 0.02 | 11 |
| Rimsulfuron | 12 | 1.0 | 0.01 | 0.01 | 17 |
| S-Metolachlor | 12 | 1.0 | 1.64 | 1.64 | 2,415 |
| Insecticides | | | | | |
| Bifenthrin | 2 | 1.0 | 0.07 | 0.07 | 21 |
| Chlorpyrifos | 2 | 1.0 | 1.00 | 1.00 | 286 |
| Tefluthrin | 2 | 1.0 | 0.10 | 0.10 | 28 |

[1] Planted acres in 2002 for Iowa were 12.3 million acres.

## Corn: Agricultural Chemical Applications, Minnesota, 2002 [1]

| Active Ingredient | Area Applied | Appli-cations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| Acetochlor | 29 | 1.0 | 1.58 | 1.58 | 3,285 |
| Atrazine | 37 | 1.0 | 0.58 | 0.59 | 1,590 |
| Bromoxynil | 4 | 1.0 | 0.32 | 0.32 | 101 |
| Clopyralid | 17 | 1.0 | 0.10 | 0.10 | 121 |
| Dicamba | 23 | 1.0 | 0.25 | 0.25 | 405 |
| Dicamba, Dimet. salt | 8 | 1.0 | 0.12 | 0.12 | 63 |
| Dicamba, Pot. salt | 6 | 1.0 | 0.30 | 0.30 | 123 |
| Diflufenzopyr-sodium | 7 | 1.0 | 0.05 | 0.05 | 24 |
| Dimethenamid | 4 | 1.0 | 1.59 | 1.59 | 502 |
| Dimethenamid-P | 4 | 1.0 | 0.92 | 0.92 | 292 |
| Flumetsulam | 18 | 1.0 | 0.04 | 0.04 | 47 |
| Foramsulfuron | 3 | 1.0 | 0.03 | 0.03 | 8 |
| Glufosinate-ammonium | 9 | 1.0 | 0.31 | 0.31 | 196 |
| Glyphosate | 11 | 1.1 | 0.66 | 0.73 | 577 |
| Mesotrione | 11 | 1.0 | 0.08 | 0.08 | 64 |
| Nicosulfuron | 27 | 1.0 | 0.02 | 0.02 | 35 |
| Primisulfuron | 7 | 1.0 | 0.02 | 0.02 | 9 |
| Rimsulfuron | 22 | 1.0 | 0.01 | 0.01 | 18 |
| S-Metolachlor | 6 | 1.0 | 1.78 | 1.78 | 809 |

[1] Planted acres in 2002 for Minnesota were 7.20 million acres.

## Corn: Agricultural Chemical Applications, Nebraska, 2002 [1]

| Active Ingredient | Area Applied | Applications | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| 2,4-D | 4 | 1.0 | 0.51 | 0.51 | 150 |
| Acetamide | 4 | 1.0 | 0.31 | 0.31 | 102 |
| Acetochlor | 23 | 1.0 | 1.54 | 1.57 | 2,985 |
| Alachlor | 2 | 1.0 | 1.95 | 1.95 | 408 |
| Atrazine | 64 | 1.0 | 0.91 | 0.99 | 5,356 |
| Carfentrazone-ethyl | 4 | 1.0 | 0.01 | 0.01 | 5 |
| Clopyralid | 9 | 1.0 | 0.09 | 0.09 | 63 |
| Dicamba | 5 | 1.0 | 0.32 | 0.32 | 129 |
| Dicamba, Dimet. salt | 3 | 1.0 | 0.11 | 0.11 | 29 |
| Dicamba, Pot. salt | 2 | 1.0 | 0.39 | 0.39 | 71 |
| Diflufenzopyr-sodium | 3 | 1.0 | 0.05 | 0.05 | 12 |
| Dimethenamid | 6 | 1.0 | 0.76 | 0.76 | 362 |
| Flumetsulam | 9 | 1.0 | 0.03 | 0.03 | 23 |
| Glyphosate | 8 | 1.0 | 0.67 | 0.73 | 503 |
| Isoxaflutole | 11 | 1.0 | 0.05 | 0.05 | 46 |
| Mesotrione | 7 | 1.0 | 0.08 | 0.08 | 49 |
| Metolachlor | 9 | 1.0 | 1.16 | 1.22 | 935 |
| Nicosulfuron | 8 | 1.0 | 0.02 | 0.02 | 14 |
| Primisulfuron | 7 | 1.0 | 0.02 | 0.02 | 13 |
| Prosulfuron | 7 | 1.0 | 0.01 | 0.01 | 6 |
| Rimsulfuron | 8 | 1.0 | 0.01 | 0.01 | 8 |
| S-Metolachlor | 20 | 1.0 | 0.88 | 0.88 | 1,466 |
| Insecticides | | | | | |
| Bifenthrin | 3 | 1.0 | 0.05 | 0.05 | 14 |
| Chlorpyrifos | 4 | 1.1 | 0.74 | 0.82 | 307 |
| Cyfluthrin | 6 | 1.0 | 0.005 | 0.005 | 3 |
| Dimethoate | 4 | 1.0 | 0.42 | 0.42 | 125 |
| Fipronil | 7 | 1.0 | 0.09 | 0.09 | 53 |
| Permethrin | 3 | 1.1 | 0.10 | 0.11 | 25 |
| Tebupirimphos | 6 | 1.0 | 0.11 | 0.11 | 52 |
| Tefluthrin | 9 | 1.0 | 0.10 | 0.10 | 76 |
| Terbufos | 3 | 1.0 | 1.01 | 1.01 | 223 |

[1] Planted acres in 2002 for Nebraska were 8.40 million acres.

## Corn: Agricultural Chemical Applications, Ohio, 2002 [1]

| Active Ingredient | Area Applied | Appli-cations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| 2,4-D | 11 | 1.0 | 0.42 | 0.42 | 140 |
| Acetochlor | 29 | 1.0 | 1.97 | 1.97 | 1,814 |
| Atrazine | 79 | 1.0 | 1.34 | 1.36 | 3,444 |
| Dicamba | 8 | 1.1 | 0.18 | 0.20 | 49 |
| Dicamba, Dimet. salt | 6 | 1.0 | 0.12 | 0.12 | 21 |
| Diflufenzopyr-sodium | 6 | 1.0 | 0.05 | 0.05 | 10 |
| Dimethenamid | 6 | 1.0 | 1.24 | 1.24 | 236 |
| Flumetsulam | 4 | 1.0 | 0.05 | 0.05 | 6 |
| Glyphosate | 20 | 1.0 | 0.65 | 0.65 | 422 |
| Isoxaflutole | 5 | 1.0 | 0.07 | 0.07 | 11 |
| Metolachlor | 9 | 1.0 | 1.11 | 1.11 | 310 |
| Nicosulfuron | 5 | 1.1 | 0.02 | 0.03 | 4 |
| S-Metolachlor | 24 | 1.0 | 1.29 | 1.29 | 997 |
| Simazine | 18 | 1.0 | 0.99 | 0.99 | 555 |
| Insecticides | | | | | |
| Permethrin | 6 | 1.0 | 0.10 | 0.10 | 19 |

[1] Planted acres in 2002 for Ohio were 3.20 million acres.

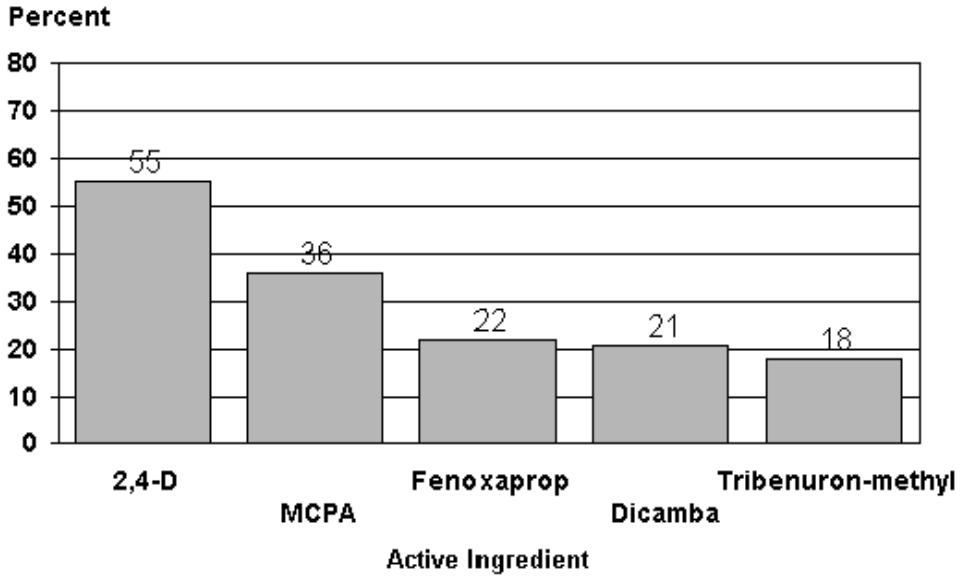
## Corn: Agricultural Chemical Applications, Wisconsin, 2002 [1]

| Active Ingredient | Area Applied | Appli-cations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| 2,4-D | 6 | 1.0 | 0.39 | 0.39 | 86 |
| Acetochlor | 21 | 1.0 | 1.50 | 1.50 | 1,130 |
| Atrazine | 47 | 1.0 | 0.90 | 0.90 | 1,537 |
| Clopyralid | 25 | 1.0 | 0.12 | 0.12 | 105 |
| Dicamba | 19 | 1.0 | 0.18 | 0.19 | 129 |
| Dicamba, Pot. salt | 7 | 1.0 | 0.42 | 0.42 | 103 |
| Flumetsulam | 27 | 1.0 | 0.04 | 0.04 | 40 |
| Glyphosate | 18 | 1.0 | 0.74 | 0.78 | 507 |
| Nicosulfuron | 17 | 1.0 | 0.02 | 0.02 | 12 |
| Pendimethalin | 7 | 1.0 | 1.27 | 1.27 | 313 |
| Rimsulfuron | 14 | 1.0 | 0.01 | 0.01 | 5 |
| S-Metolachlor | 10 | 1.0 | 1.60 | 1.60 | 588 |
| Insecticides | | | | | |
| Chlorpyrifos | 5 | 1.0 | 0.48 | 0.48 | 82 |

[1] Planted acres in 2002 for Wisconsin were 3.65 million acres.

## Durum Wheat: Number of Usable Reports, 2002


Durum Wheat: Percent of Acres Treated
Top 5 Active Ingredients for 2002
North Dakota



## Durum Wheat: Fertilizer Use by State, 2002
## Percent of Acres Treated and Total Amount Applied

| State | Planted Acreage | Percent of Acres Treated and Total Applied | | | | | |
|---|---|---|---|---|---|---|---|
| | | Nitrogen | | Phosphate | | Potash | |
| | *1,000 Acres* | *Pct* | *Mil. Lbs* | *Pct* | *Mil. Lbs* | *Pct* | *Mil. Lbs* |
| ND | 2,100 | 88 | 116.1 | 58 | 31.6 | 5 | 1.2 |

## Durum Wheat: Fertilizer Primary Nutrient Applications, Program States and Total, 2002

| Primary Nutrient | Planted Acreage | Area Applied | Applic-ations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|---|
| | *1,000 Acres* | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *Mil. Lbs* |
| North Dakota | 2,100 | | | | | |
| Nitrogen | | 88 | 1.6 | 40 | 62 | 116.1 |
| Phosphate | | 58 | 1.0 | 26 | 26 | 31.6 |
| Potash | | 5 | 1.0 | 12 | 12 | 1.2 |

**Durum Wheat: Active Ingredients**
**Publication Status**

| Active Ingredient | ND |
|---|---|
| Herbicides | |
| 2,4-D | P |
| 2,4-D, Dimeth. salt | * |
| Acetic acid | * |
| Bromoxynil | P |
| Bromoxynil octanoate | * |
| Clodinafop-propargil | P |
| Clopyralid | * |
| Dicamba | P |
| Dicamba, Dimet. salt | * |
| Fenoxaprop | P |
| Flucarbazone-sodium | * |
| Fluroxypyr | * |
| Fluroxypyr 1-methylh | P |
| Glyphosate | P |
| MCPA | P |
| Prosulfuron | * |
| Sulfosate | * |
| Thifensulfuron | P |
| Triallate | * |
| Triasulfuron | * |
| Tribenuron-methyl | P |
| Trifluralin | P |
| Fungicides | |
| Propiconazole | * |
| Trifloxystrobin | * |

P Usage data are published for this active ingredient.
* Usage data are not published for this active ingredient.

## Durum Wheat: Pesticide, Planted Acreage, Percent of Area Receiving Applications and Total Applied, North Dakota, 2002

| State | Planted Acreage | Area Receiving and Total Applied | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Herbicide | | Insecticide | | Fungicide | | Other | |
| | *1,000 Acres* | *Pct* | *1,000 Lbs* | *Pct* | *1,000 Lbs* | *Pct* | *1,000 Lbs* | *Pct* | *1,000 Lbs* |
| ND [1] | 2,100 | 100 | 1,238 | | | | | | |

[1] Insufficient reports to publish data for one or more pesticide classes.

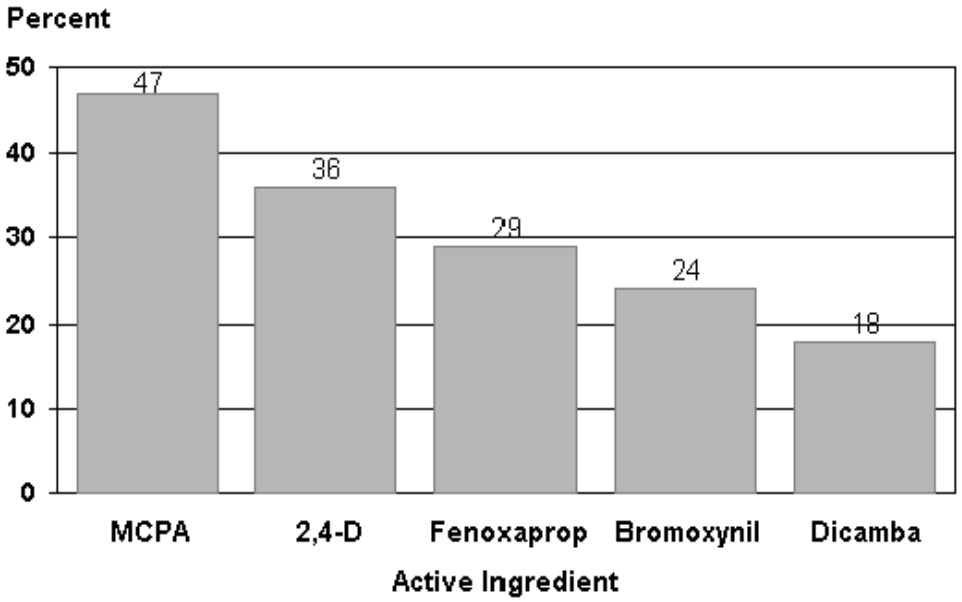
## Durum Wheat: Agricultural Chemical Applications, North Dakota, 2002 [1]

| Active Ingredient | Area Applied | Appli-cations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| 2,4-D | 55 | 1.0 | 0.33 | 0.33 | 382 |
| Bromoxynil | 10 | 1.0 | 0.21 | 0.21 | 44 |
| Clodinafop-propargil | 12 | 1.0 | 0.05 | 0.05 | 12 |
| Dicamba | 21 | 1.0 | 0.05 | 0.05 | 22 |
| Fenoxaprop | 22 | 1.0 | 0.05 | 0.05 | 24 |
| Fluroxypyr 1-methylh | 6 | 1.0 | 0.14 | 0.14 | 18 |
| Glyphosate | 14 | 1.0 | 0.45 | 0.45 | 128 |
| MCPA | 36 | 1.0 | 0.35 | 0.36 | 273 |
| Thifensulfuron | 7 | 1.0 | 0.008 | 0.008 | 1 |
| Tribenuron-methyl | 18 | 1.0 | 0.006 | 0.006 | 2 |
| Trifluralin | 14 | 1.0 | 0.36 | 0.36 | 103 |

[1] Planted acres in 2002 for North Dakota were 2.10 million acres.

## Other Spring Wheat: Number of Usable Reports, 2002


## Other Spring Wheat: Percent of Acres Treated
## Top 5 Active Ingredients for 2002




**Surveyed states are MN, MT, and ND**

## Other Spring Wheat: Fertilizer Use by State, 2002
## Percent of Acres Treated and Total Amount Applied

| State | Planted Acreage | Percent of Acres Treated and Total Applied | | | | | |
|---|---|---|---|---|---|---|---|
| | | Nitrogen | | Phosphate | | Potash | |
| | *1,000 Acres* | *Pct* | *Mil. Lbs* | *Pct* | *Mil. Lbs* | *Pct* | *Mil. Lbs* |
| MN | 2,000 | 89 | 129.0 | 83 | 60.8 | 68 | 44.7 |
| MT | 3,750 | 66 | 97.8 | 54 | 47.0 | 21 | 14.9 |
| ND | 6,900 | 97 | 499.8 | 83 | 197.7 | 19 | 30.6 |
| Total | 12,650 | 86 | 726.6 | 74 | 305.5 | 27 | 90.2 |

## Other Spring Wheat: Fertilizer Primary Nutrient Applications, Program States and Total, 2002

| Primary Nutrient | Planted Acreage | Area Applied | Applic-ations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|---|
| | *1,000 Acres* | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *Mil. Lbs* |
| Minnesota | 2,000 | | | | | |
| Nitrogen | | 89 | 1.1 | 62 | 73 | 129.0 |
| Phosphate | | 83 | 1.0 | 36 | 37 | 60.8 |
| Potash | | 68 | 1.0 | 32 | 33 | 44.7 |
| Montana | 3,750 | | | | | |
| Nitrogen | | 66 | 1.2 | 33 | 40 | 97.8 |
| Phosphate | | 54 | 1.0 | 23 | 23 | 47.0 |
| Potash | | 21 | 1.0 | 19 | 19 | 14.9 |
| North Dakota | 6,900 | | | | | |
| Nitrogen | | 97 | 1.6 | 46 | 75 | 499.8 |
| Phosphate | | 83 | 1.0 | 34 | 35 | 197.7 |
| Potash | | 19 | 1.0 | 24 | 24 | 30.6 |
| Total | 12,650 | | | | | |
| Nitrogen | | 86 | 1.4 | 46 | 63 | 726.6 |
| Phosphate | | 74 | 1.0 | 31 | 32 | 305.5 |
| Potash | | 27 | 1.0 | 27 | 27 | 90.2 |

## Other Spring Wheat: Active Ingredients and Publication Status By Program States, 2002

| Active Ingredient | Program States | | | |
|---|---|---|---|---|
| | ALL | MN | MT | ND |
| Herbicides | | | | |
| 2,4-D | P | P | P | P |
| Acetic acid | P | * | * | * |
| Bromoxynil | P | P | P | P |
| Bromoxynil octanoate | P | * | | * |
| Chlorsulfuron | P | | P | |
| Clodinafop-propargil | P | P | P | P |
| Clopyralid | P | * | | * |
| Dicamba | P | * | P | * |
| Dicamba, Dimet. salt | * | | | * |
| Difenzoquat | * | | | * |
| Fenoxaprop | P | P | P | P |
| Flucarbazone-sodium | * | * | | * |
| Fluroxypyr | P | * | * | P |
| Fluroxypyr 1-methylh | P | * | * | P |
| Glyphosate | P | P | P | P |
| MCPA | P | P | P | P |
| Metsulfuron-methyl | P | | P | |
| Picloram | P | | * | * |
| Prosulfuron | * | | * | |
| Sulfentrazone | * | | * | |
| Sulfosate | * | | * | |
| Thifensulfuron | P | P | P | P |
| Triallate | * | | * | * |
| Triasulfuron | P | | P | |
| Tribenuron-methyl | P | P | P | P |
| Trifluralin | * | | * | * |
| Insecticides | | | | |
| Chlorpyrifos | * | | | * |
| Dimethoate | * | | | * |
| Fungicides | | | | |
| Propiconazole | P | P | | * |
| Tebuconazole | P | * | | * |

P Usage data are published for this active ingredient.
* Usage data are not published for this active ingredient.

## Other Spring Wheat: Pesticide, Planted Acreage, Percent of Area Receiving Applications and Total Applied, Program States and Total, 2002

| State | Planted Acreage | Area Receiving and Total Applied | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Herbicide | | Insecticide | | Fungicide | | Other | |
| | *1,000 Acres* | *Pct* | *1,000 Lbs* | *Pct* | *1,000 Lbs* | *Pct* | *1,000 Lbs* | *Pct* | *1,000 Lbs* |
| MN | 2,000 | 84 | 858 | | | 8 | 15 | | |
| MT | 3,750 | 89 | 2,171 | | | | | | |
| ND [1] | 6,900 | 95 | 3,749 | | | 8 | 53 | | |
| Total [1] | 12,650 | 91 | 6,778 | | | 6 | 68 | | |

[1] Insufficient reports to publish data for one or more pesticide classes.

## Other Spring Wheat: Agricultural Chemical Applications, Program States, 2002 [1]

| Active Ingredient | Area Applied | Appli-cations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| 2,4-D | 36 | 1.1 | 0.34 | 0.39 | 1,785 |
| Acetic acid | 3 | 1.0 | 0.46 | 0.46 | 146 |
| Bromoxynil | 24 | 1.0 | 0.24 | 0.24 | 716 |
| Bromoxynil octanoate | 2 | 1.0 | 0.29 | 0.29 | 64 |
| Chlorsulfuron | 1 | 1.0 | 0.01 | 0.01 | 1 |
| Clodinafop-propargil | 8 | 1.0 | 0.04 | 0.04 | 46 |
| Clopyralid | 2 | 1.0 | 0.08 | 0.08 | 21 |
| Dicamba | 18 | 1.0 | 0.05 | 0.05 | 120 |
| Fenoxaprop | 29 | 1.0 | 0.06 | 0.06 | 239 |
| Fluroxypyr | 5 | 1.0 | 0.07 | 0.07 | 44 |
| Fluroxypyr 1-methylh | 3 | 1.0 | 0.13 | 0.13 | 42 |
| Glyphosate | 15 | 1.4 | 0.44 | 0.63 | 1,235 |
| MCPA | 47 | 1.0 | 0.31 | 0.31 | 1,808 |
| Metsulfuron-methyl | 7 | 1.0 | 0.004 | 0.004 | 3 |
| Picloram | 2 | 1.0 | 0.01 | 0.01 | 3 |
| Thifensulfuron | 10 | 1.0 | 0.01 | 0.01 | 14 |
| Triasulfuron | 4 | 1.0 | 0.01 | 0.01 | 6 |
| Tribenuron-methyl | 12 | 1.0 | 0.006 | 0.006 | 9 |
| Fungicides | | | | | |
| Propiconazole | 2 | 1.0 | 0.09 | 0.09 | 25 |
| Tebuconazole | 3 | 1.1 | 0.09 | 0.10 | 43 |

[1] Planted acres in 2002 for the 3 program states were 12.7 million acres.
States included are MN, MT and ND.

## Other Spring Wheat: Agricultural Chemical Applications, Minnesota, 2002 [1]

| Active Ingredient | Area Applied | Appli-cations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| 2,4-D | 20 | 1.0 | 0.43 | 0.44 | 171 |
| Bromoxynil | 35 | 1.0 | 0.24 | 0.24 | 170 |
| Clodinafop-propargil | 5 | 1.0 | 0.05 | 0.05 | 5 |
| Fenoxaprop | 30 | 1.0 | 0.07 | 0.07 | 42 |
| Glyphosate | 6 | 1.0 | 0.66 | 0.66 | 75 |
| MCPA | 53 | 1.0 | 0.33 | 0.33 | 351 |
| Thifensulfuron | 8 | 1.0 | 0.01 | 0.01 | 2 |
| Tribenuron-methyl | 7 | 1.0 | 0.007 | 0.007 | 1 |
| Fungicides | | | | | |
| Propiconazole | 5 | 1.0 | 0.08 | 0.08 | 7 |

[1] Planted acres in 2002 for Minnesota were 2.00 million acres.

## Other Spring Wheat: Agricultural Chemical Applications, Montana, 2002 [1]

| Active Ingredient | Area Applied | Appli-cations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| 2,4-D | 65 | 1.2 | 0.34 | 0.41 | 997 |
| Bromoxynil | 8 | 1.0 | 0.22 | 0.22 | 66 |
| Chlorsulfuron | 4 | 1.0 | 0.01 | 0.01 | 1 |
| Clodinafop-propargil | 13 | 1.0 | 0.05 | 0.05 | 22 |
| Dicamba | 32 | 1.1 | 0.05 | 0.05 | 66 |
| Fenoxaprop | 4 | 1.0 | 0.05 | 0.05 | 9 |
| Glyphosate | 19 | 1.8 | 0.41 | 0.74 | 533 |
| MCPA | 15 | 1.0 | 0.28 | 0.28 | 155 |
| Metsulfuron-methyl | 22 | 1.0 | 0.004 | 0.004 | 3 |
| Thifensulfuron | 5 | 1.0 | 0.008 | 0.008 | 1 |
| Triasulfuron | 13 | 1.0 | 0.01 | 0.01 | 6 |
| Tribenuron-methyl | 7 | 1.0 | 0.005 | 0.005 | 1 |

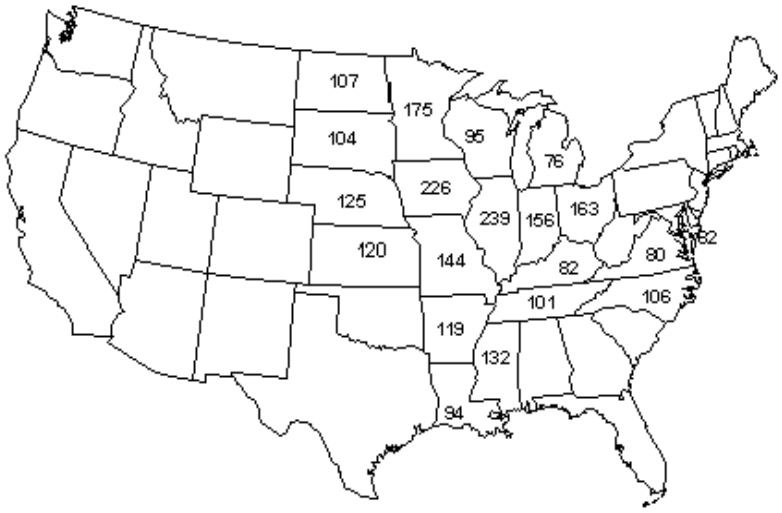
[1] Planted acres in 2002 for Montana were 3.75 million acres.

## Other Spring Wheat: Agricultural Chemical Applications, North Dakota, 2002 [1]

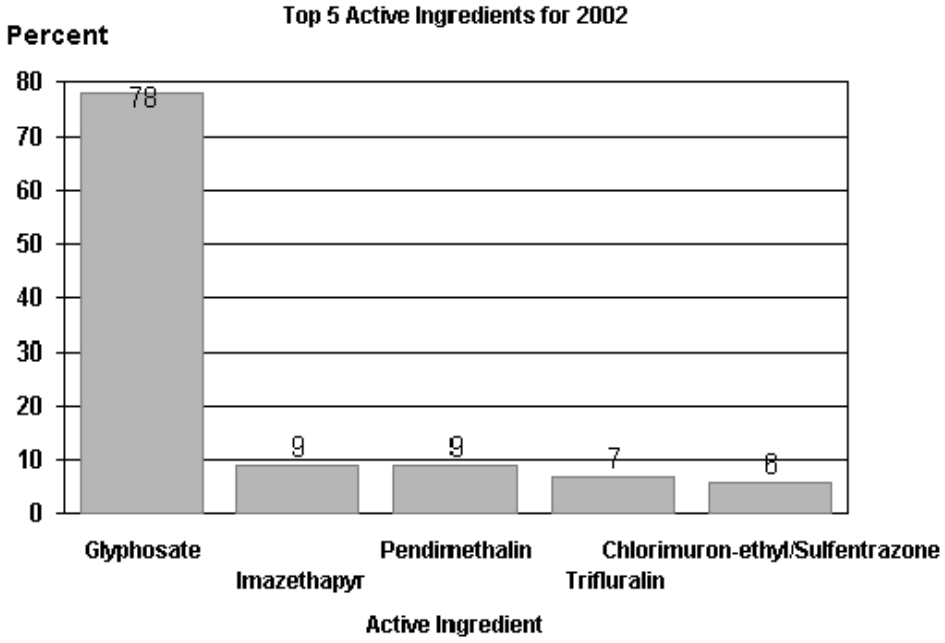
| Active Ingredient | Area Applied | Appli-cations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| 2,4-D | 26 | 1.0 | 0.34 | 0.34 | 617 |
| Bromoxynil | 30 | 1.0 | 0.23 | 0.23 | 480 |
| Clodinafop-propargil | 7 | 1.0 | 0.04 | 0.04 | 19 |
| Fenoxaprop | 42 | 1.0 | 0.06 | 0.06 | 189 |
| Fluroxypyr | 7 | 1.0 | 0.07 | 0.07 | 31 |
| Fluroxypyr 1-methylh | 4 | 1.0 | 0.13 | 0.13 | 37 |
| Glyphosate | 16 | 1.0 | 0.56 | 0.56 | 628 |
| MCPA | 62 | 1.0 | 0.30 | 0.30 | 1,302 |
| Thifensulfuron | 13 | 1.0 | 0.01 | 0.01 | 11 |
| Tribenuron-methyl | 16 | 1.0 | 0.006 | 0.006 | 7 |

[1] Planted acres in 2002 for North Dakota were 6.90 million acres.

## Soybeans: Number of Usable Reports, 2002




## Soybeans: Percent of Acres Treated




Surveyed states are AR, IL, IN, IA, KS, KY, LA, MD, MI, MN, MS, MO, NE, NC, ND, OH, SD, TN, VA, and WI

## Soybeans: Fertilizer Use by State, 2002
## Percent of Acres Treated and Total Amount Applied

| State | Planted Acreage | Percent of Acres Treated and Total Applied | | | | | |
|---|---|---|---|---|---|---|---|
| | | Nitrogen | | Phosphate | | Potash | |
| | *1,000 Acres* | *Pct* | *Mil. Lbs* | *Pct* | *Mil. Lbs* | *Pct* | *Mil. Lbs* |
| AR | 2,950 | 7 | 5.2 | 36 | 57.8 | 35 | 66.1 |
| IL | 10,550 | 18 | 37.5 | 25 | 143.1 | 38 | 422.6 |
| IN | 5,800 | 18 | 17.4 | 24 | 67.9 | 46 | 276.0 |
| IA | 10,400 | 3 | 9.3 | 7 | 48.3 | 12 | 163.7 |
| KS | 2,750 | 24 | 12.2 | 25 | 28.7 | 8 | 5.9 |
| KY | 1,290 | 21 | 9.6 | 37 | 30.3 | 38 | 46.6 |
| LA | 790 | 2 | 0.1 | 18 | 5.5 | 18 | 7.5 |
| MD | 490 | 23 | 2.7 | 17 | 2.9 | 26 | 7.0 |
| MI | 2,050 | 44 | 24.4 | 34 | 32.0 | 67 | 119.1 |
| MN | 7,200 | 11 | 16.1 | 12 | 34.2 | 10 | 39.1 |
| MS | 1,440 | 12 | 3.7 | 20 | 15.8 | 20 | 25.7 |
| MO | 5,050 | 13 | 11.8 | 29 | 62.9 | 36 | 158.1 |
| NE | 4,700 | 31 | 23.1 | 36 | 79.9 | 11 | 14.6 |
| NC | 1,360 | 36 | 14.4 | 36 | 25.0 | 41 | 51.3 |
| ND | 2,670 | 64 | 44.1 | 59 | 50.5 | 11 | 3.3 |
| OH | 4,750 | 20 | 14.1 | 27 | 62.6 | 56 | 276.4 |
| SD | 4,250 | 37 | 32.5 | 41 | 102.0 | 15 | 24.4 |
| TN | 1,160 | 42 | 14.5 | 47 | 31.1 | 57 | 48.6 |
| VA | 480 | 25 | 3.6 | 33 | 7.3 | 46 | 18.4 |
| WI | 1,540 | 40 | 9.2 | 35 | 18.9 | 48 | 54.7 |
| Total | 71,670 | 20 | 305.5 | 26 | 906.7 | 29 | 1,829.1 |

## Soybeans: Fertilizer Primary Nutrient Applications, Program States and Total, 2002

| Primary Nutrient | Planted Acreage | Area Applied | Applic-ations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|---|
| | *1,000 Acres* | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *Mil. Lbs* |
| Arkansas | 2,950 | | | | | |
| Nitrogen | | 7 | 1.0 | 24 | 24 | 5.2 |
| Phosphate | | 36 | 1.0 | 54 | 55 | 57.8 |
| Potash | | 35 | 1.0 | 62 | 63 | 66.1 |
| Illinois | 10,550 | | | | | |
| Nitrogen | | 18 | 1.0 | 20 | 20 | 37.5 |
| Phosphate | | 25 | 1.0 | 54 | 54 | 143.1 |
| Potash | | 38 | 1.0 | 105 | 105 | 422.6 |
| Indiana | 5,800 | | | | | |
| Nitrogen | | 18 | 1.0 | 17 | 17 | 17.4 |
| Phosphate | | 24 | 1.0 | 48 | 48 | 67.9 |
| Potash | | 46 | 1.0 | 102 | 104 | 276.0 |
| Iowa | 10,400 | | | | | |
| Nitrogen | | 3 | 1.0 | 26 | 26 | 9.3 |
| Phosphate | | 7 | 1.0 | 70 | 70 | 48.3 |
| Potash | | 12 | 1.0 | 120 | 127 | 163.7 |
| Kansas | 2,750 | | | | | |
| Nitrogen | | 24 | 1.0 | 17 | 18 | 12.2 |
| Phosphate | | 25 | 1.0 | 43 | 43 | 28.7 |
| Potash | | 8 | 1.0 | 26 | 26 | 5.9 |
| Kentucky | 1,290 | | | | | |
| Nitrogen | | 21 | 1.1 | 31 | 35 | 9.6 |
| Phosphate | | 37 | 1.0 | 64 | 64 | 30.3 |
| Potash | | 38 | 1.0 | 95 | 95 | 46.6 |
| Louisiana | 790 | | | | | |
| Nitrogen | | 2 | 1.0 | 11 | 11 | 0.1 |
| Phosphate | | 18 | 1.0 | 40 | 40 | 5.5 |
| Potash | | 18 | 1.0 | 54 | 54 | 7.5 |
| Maryland | 490 | | | | | |
| Nitrogen | | 23 | 1.0 | 22 | 24 | 2.7 |
| Phosphate | | 17 | 1.0 | 35 | 35 | 2.9 |
| Potash | | 26 | 1.0 | 55 | 55 | 7.0 |
| Michigan | 2,050 | | | | | |
| Nitrogen | | 44 | 1.0 | 26 | 27 | 24.4 |
| Phosphate | | 34 | 1.0 | 46 | 46 | 32.0 |
| Potash | | 67 | 1.0 | 82 | 87 | 119.1 |
| Minnesota | 7,200 | | | | | |
| Nitrogen | | 11 | 1.0 | 20 | 20 | 16.1 |
| Phosphate | | 12 | 1.0 | 38 | 38 | 34.2 |
| Potash | | 10 | 1.0 | 52 | 52 | 39.1 |

## Soybeans: Fertilizer Primary Nutrient Applications, Program States and Total, 2002

| Primary Nutrient | Planted Acreage | Area Applied | Applic-ations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|---|
| | *1,000 Acres* | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *Mil. Lbs* |
| Mississippi | 1,440 | | | | | |
| Nitrogen | | 12 | 1.0 | 22 | 22 | 3.7 |
| Phosphate | | 20 | 1.0 | 56 | 56 | 15.8 |
| Potash | | 20 | 1.0 | 88 | 88 | 25.7 |
| Missouri | 5,050 | | | | | |
| Nitrogen | | 13 | 1.0 | 18 | 18 | 11.8 |
| Phosphate | | 29 | 1.0 | 44 | 44 | 62.9 |
| Potash | | 36 | 1.0 | 87 | 87 | 158.1 |
| Nebraska | 4,700 | | | | | |
| Nitrogen | | 31 | 1.0 | 15 | 16 | 23.1 |
| Phosphate | | 36 | 1.0 | 45 | 47 | 79.9 |
| Potash | | 11 | 1.0 | 28 | 28 | 14.6 |
| North Carolina | 1,360 | | | | | |
| Nitrogen | | 36 | 1.0 | 29 | 29 | 14.4 |
| Phosphate | | 36 | 1.0 | 51 | 51 | 25.0 |
| Potash | | 41 | 1.0 | 91 | 91 | 51.3 |
| North Dakota | 2,670 | | | | | |
| Nitrogen | | 64 | 1.3 | 19 | 26 | 44.1 |
| Phosphate | | 59 | 1.0 | 32 | 32 | 50.5 |
| Potash | | 11 | 1.0 | 11 | 12 | 3.3 |
| Ohio | 4,750 | | | | | |
| Nitrogen | | 20 | 1.1 | 13 | 15 | 14.1 |
| Phosphate | | 27 | 1.0 | 49 | 49 | 62.6 |
| Potash | | 56 | 1.0 | 103 | 103 | 276.4 |
| South Dakota | 4,250 | | | | | |
| Nitrogen | | 37 | 1.1 | 18 | 20 | 32.5 |
| Phosphate | | 41 | 1.0 | 54 | 58 | 102.0 |
| Potash | | 15 | 1.4 | 27 | 39 | 24.4 |
| Tennessee | 1,160 | | | | | |
| Nitrogen | | 42 | 1.1 | 27 | 30 | 14.5 |
| Phosphate | | 47 | 1.0 | 54 | 57 | 31.1 |
| Potash | | 57 | 1.0 | 73 | 73 | 48.6 |
| Virginia | 480 | | | | | |
| Nitrogen | | 25 | 1.0 | 29 | 29 | 3.6 |
| Phosphate | | 33 | 1.0 | 44 | 46 | 7.3 |
| Potash | | 46 | 1.0 | 80 | 83 | 18.4 |
| Wisconsin | 1,540 | | | | | |
| Nitrogen | | 40 | 1.0 | 14 | 15 | 9.2 |
| Phosphate | | 35 | 1.0 | 35 | 35 | 18.9 |
| Potash | | 48 | 1.0 | 73 | 73 | 54.7 |

## Soybeans: Fertilizer Primary Nutrient Applications, Program States and Total, 2002

| Primary Nutrient | Planted Acreage | Area Applied | Applic-ations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|---|
| | *1,000 Acres* | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *Mil. Lbs* |
| Total | 71,670 | | | | | |
| Nitrogen | | 20 | 1.1 | 19 | 21 | 305.5 |
| Phosphate | | 26 | 1.0 | 48 | 49 | 906.7 |
| Potash | | 29 | 1.0 | 87 | 89 | 1,829.1 |

## Soybeans: Active Ingredients and Publication Status By Program States, 2002

| Active Ingredient | Program States | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | ALL | AR | IL | IN | IA | KS | KY | LA |
| Herbicides | | | | | | | | |
| 2,4-D | P | | P | P | * | P | P | * |
| 2,4-DB, Dimeth. Salt | P | | | | | | * | * |
| Acetamide | P | | | * | * | * | | |
| Acetic acid | P | | P | * | * | | | * |
| Acifluorfen | P | * | P | * | P | * | * | P |
| Alachlor | P | | | | * | | | * |
| Atrazine | * | | * | | | | | |
| Bentazon | P | * | * | * | | | * | * |
| Butoxy. ester 2,4-D | * | | | | * | * | | |
| Carfentrazone-ethyl | P | | * | * | | * | * | |
| Chlorimuron-ethyl | P | * | P | P | P | * | * | P |
| Clethodim | P | * | P | * | * | | * | * |
| Clomazone | P | | | * | | | | |
| Cloransulam-methyl | P | * | P | * | P | * | * | * |
| Dicamba | * | | * | | | * | | |
| Dichlorprop | * | | * | * | | | | |
| Dimethenamid | * | | | | | * | | |
| Ethalfluralin | P | | | | | | | |
| Fenoxaprop | P | | P | P | P | * | * | |
| Fluazifop-P-butyl | P | * | P | P | P | * | * | * |
| Flumetsulam | P | * | * | | * | | | * |
| Flumiclorac-pentyl | P | | * | | * | | | * |
| Flumioxazin | P | | * | * | | | * | |
| Fomesafen | P | * | P | P | P | | * | * |
| Glyphosate | P | P | P | P | P | P | P | P |
| Glyphosate diam salt | P | * | P | P | P | P | * | * |
| Halosulfuron | * | | | | | | | * |
| Imazamox | P | | P | * | * | | * | |
| Imazaquin | P | * | * | P | * | * | * | P |
| Imazaquin, sod. salt | P | | | | | | | * |
| Imazethapyr | P | * | P | P | P | P | P | |
| Lactofen | P | | P | | * | | * | |
| Linuron | * | | | | | | | |
| MCPA | * | | | | | | | |
| Metolachlor | P | * | | | * | | | * |
| Metribuzin | P | * | * | P | * | P | | * |
| Oxyfluorfen | * | | | | | | | * |
| Paraquat | P | | * | * | * | * | * | P |
| Pendimethalin | P | * | P | P | P | P | * | P |
| Quizalofop-P-ethyl | P | * | | * | * | | | |
| Quizalofop-ethyl | * | | | | | | | |
| S-Metolachlor | P | * | * | * | * | * | | * |
| Sethoxydim | P | | * | * | P | * | | * |
| Simazine | * | | * | | | | | |
| Sulfentrazone | P | * | P | P | P | * | | * |
| Sulfosate | P | | * | * | * | * | * | P |
| Thifensulfuron | P | | * | * | * | * | * | |
| Tribenuron-methyl | P | | P | | | | * | |
| Trifluralin | P | * | P | | P | * | * | |
| Vernolate | * | | | | | | | |

See footnote(s) at end of table.

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## Soybeans: Active Ingredients and Publication Status By Program States, 2002

| Active Ingredient | Program States | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | ALL | AR | IL | IN | IA | KS | KY | LA |
| Insecticides | | | | | | | | |
| Acephate | * | | | | | | | * |
| Aldicarb | * | | | | | | | |
| Benzoic acid | P | | | | | | | P |
| Carbaryl | P | | * | | | | | |
| Carbofuran | * | * | * | | | | | |
| Chlorpyrifos | P | | | | | | | * |
| Cypermethrin | * | | | | | | | * |
| Dicrotophos | * | | | | | | | * |
| Diflubenzuron | P | | | | | | | P |
| Dimethoate | P | | * | | | | | |
| Esfenvalerate | P | | | | * | | | * |
| Helicoverpa zea NPV | * | | | | | | | |
| Indoxacarb | * | | | | | | | |
| Lambda-cyhalothrin | P | * | * | | * | * | | P |
| Malathion | * | * | | | | | | * |
| Methomyl | * | | | | | | | |
| Methyl parathion | P | * | | | | | | P |
| Permethrin | P | | | * | P | | | |
| Phorate | * | | | | * | | | |
| Thiodicarb | P | | | | | | | P |
| Tralomethrin | * | | | | | | | * |
| Zeta-cypermethrin | P | | | | * | * | | P |
| Fungicides | | | | | | | | |
| Azoxystrobin | P | * | | | | | | P |
| Sulfur | * | | | | | | | |
| Thiophanate-methyl | * | | | | | | | |
| Other Chemicals | | | | | | | | |
| Sodium chlorate | * | | | | | | | |

See footnote(s) at end of table.

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**Soybeans: Active Ingredients**
**Publication Status**
**By Program States, 2002 (continued)**

| Active Ingredient | Program States | | | | | | |
|---|---|---|---|---|---|---|---|
| | MD | MI | MN | MS | MO | NE | NC |
| Herbicides | | | | | | | |
| 2,4-D | * | * | * | P | P | * | |
| 2,4-DB, Dimeth. Salt | | | | * | | | * |
| Acetamide | | | | | | * | |
| Acetic acid | * | * | | * | | | |
| Acifluorfen | | | * | P | * | * | |
| Alachlor | | * | | * | * | P | |
| Atrazine | | | | | | | |
| Bentazon | | * | * | * | * | | |
| Butoxy. ester 2,4-D | | | | | | | |
| Carfentrazone-ethyl | | | | | | | |
| Chlorimuron-ethyl | * | * | * | P | P | P | * |
| Clethodim | | * | * | * | * | * | |
| Clomazone | * | * | | * | | * | |
| Cloransulam-methyl | * | | * | P | P | * | * |
| Dicamba | | | | | | | |
| Dichlorprop | | | | | | | |
| Dimethenamid | * | | | | | * | * |
| Ethalfluralin | | | | | | | |
| Fenoxaprop | | * | P | * | * | * | |
| Fluazifop-P-butyl | | * | P | * | * | * | |
| Flumetsulam | | | * | * | * | * | * |
| Flumiclorac-pentyl | | | * | * | P | * | * |
| Flumioxazin | * | | | | * | | |
| Fomesafen | | * | P | * | * | * | |
| Glyphosate | P | P | P | P | P | P | P |
| Glyphosate diam salt | P | P | P | * | P | P | |
| Halosulfuron | | | | | | | |
| Imazamox | | * | P | | | | * |
| Imazaquin | | * | | P | * | * | * |
| Imazaquin, sod. salt | | | | * | | | |
| Imazethapyr | * | P | P | | * | P | P |
| Lactofen | | | * | * | | * | |
| Linuron | * | | | | | | |
| MCPA | | | | * | | | |
| Metolachlor | * | | | | | * | * |
| Metribuzin | * | * | * | * | * | P | |
| Oxyfluorfen | | | | | | | |
| Paraquat | P | | | | P | * | P |
| Pendimethalin | * | * | P | P | * | P | P |
| Quizalofop-P-ethyl | | * | | * | | * | |
| Quizalofop-ethyl | | | | | | | |
| S-Metolachlor | * | * | * | * | * | P | |
| Sethoxydim | | | * | * | * | | * |
| Simazine | * | | | | | | |
| Sulfentrazone | * | * | * | | P | * | |
| Sulfosate | * | | | | * | * | |
| Thifensulfuron | * | * | P | | * | * | * |
| Tribenuron-methyl | * | | * | | * | | |
| Trifluralin | | | P | P | * | P | * |
| Vernolate | * | | | | | | |

See footnote(s) at end of table.

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**Soybeans: Active Ingredients**
**Publication Status**
**By Program States, 2002 (continued)**

| Active Ingredient | Program States | | | | | | |
|---|---|---|---|---|---|---|---|
| | MD | MI | MN | MS | MO | NE | NC |
| Insecticides | | | | | | | |
| Acephate | | | | * | | | * |
| Aldicarb | | | | | | | * |
| Benzoic acid | | | | P | | | |
| Carbaryl | | | | | | | * |
| Carbofuran | | | | | | | |
| Chlorpyrifos | | | * | | | P | * |
| Cypermethrin | | | | * | | | |
| Dicrotophos | | | | | | | |
| Diflubenzuron | | | | * | | | |
| Dimethoate | * | * | | | | | |
| Esfenvalerate | | | | | | * | P |
| Helicoverpa zea NPV | | | | * | | | |
| Indoxacarb | | | | | | | |
| Lambda-cyhalothrin | * | | | P | | | P |
| Malathion | | | | | | | |
| Methomyl | | | | | | | * |
| Methyl parathion | | | | P | | | |
| Permethrin | | | | | | * | * |
| Phorate | | | | | | | |
| Thiodicarb | | | | | | | * |
| Tralomethrin | | | | | | | |
| Zeta-cypermethrin | | | | * | | * | * |
| Fungicides | | | | | | | |
| Azoxystrobin | | | | P | | | |
| Sulfur | | | | | | | |
| Thiophanate-methyl | | | | | | | |
| Other Chemicals | | | | | | | |
| Sodium chlorate | | | | * | | | |

See footnote(s) at end of table.

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**Soybeans: Active Ingredients**
**Publication Status**
**By Program States, 2002 (continued)**

| Active Ingredient | Program States | | | | | |
|---|---|---|---|---|---|---|
| | ND | OH | SD | TN | VA | WI |
| Herbicides | | | | | | |
| 2,4-D | | P | * | | * | P |
| 2,4-DB, Dimeth. Salt | | * | | | * | |
| Acetamide | | | | | | |
| Acetic acid | | * | | | | * |
| Acifluorfen | * | * | | * | * | |
| Alachlor | | * | | | | |
| Atrazine | | | | | | |
| Bentazon | P | | | * | | |
| Butoxy. ester 2,4-D | | | | | | |
| Carfentrazone-ethyl | | * | | | | |
| Chlorimuron-ethyl | | P | * | P | P | * |
| Clethodim | * | * | * | P | | * |
| Clomazone | | * | | * | | |
| Cloransulam-methyl | * | * | * | * | * | * |
| Dicamba | | | | | | |
| Dichlorprop | | | | | | |
| Dimethenamid | | | | | | |
| Ethalfluralin | P | | | | | |
| Fenoxaprop | * | | * | * | | * |
| Fluazifop-P-butyl | * | | * | P | P | * |
| Flumetsulam | * | * | | * | | * |
| Flumiclorac-pentyl | | * | | | * | |
| Flumioxazin | | * | * | * | | |
| Fomesafen | * | | * | * | P | |
| Glyphosate | P | P | P | P | P | P |
| Glyphosate diam salt | * | P | P | * | | P |
| Halosulfuron | | | | | | |
| Imazamox | P | * | * | | | P |
| Imazaquin | | * | | * | * | |
| Imazaquin, sod. salt | | | | | | |
| Imazethapyr | P | P | * | * | P | P |
| Lactofen | * | * | | * | | |
| Linuron | | | | | | |
| MCPA | | | | | * | |
| Metolachlor | | * | | | * | * |
| Metribuzin | * | P | | * | | * |
| Oxyfluorfen | | | | | | |
| Paraquat | | | | P | P | |
| Pendimethalin | P | P | P | * | P | P |
| Quizalofop-P-ethyl | * | * | | | | * |
| Quizalofop-ethyl | | | | | * | |
| S-Metolachlor | | * | | * | * | * |
| Sethoxydim | P | | | * | | |
| Simazine | | | | | | |
| Sulfentrazone | | P | * | * | P | * |
| Sulfosate | * | * | * | * | | |
| Thifensulfuron | * | * | * | * | * | * |
| Tribenuron-methyl | | * | | * | | |
| Trifluralin | P | * | * | * | | |
| Vernolate | | | | | | |

See footnote(s) at end of table. --continued

**Soybeans: Active Ingredients**
**Publication Status**
**By Program States, 2002 (continued)**

| Active Ingredient | Program States | | | | | |
|---|---|---|---|---|---|---|
| | ND | OH | SD | TN | VA | WI |
| Insecticides | | | | | | |
| Acephate | | | | | | |
| Aldicarb | | | | | | |
| Benzoic acid | | | | | | |
| Carbaryl | | | * | | | |
| Carbofuran | | | | | | |
| Chlorpyrifos | | | * | | | * |
| Cypermethrin | | | | | | |
| Dicrotophos | | | | | | |
| Diflubenzuron | | | | | | |
| Dimethoate | | | | | | * |
| Esfenvalerate | * | | * | | * | |
| Helicoverpa zea NPV | | | | | | |
| Indoxacarb | | | | | * | |
| Lambda-cyhalothrin | * | * | P | P | P | |
| Malathion | | | | | * | |
| Methomyl | | | | | | |
| Methyl parathion | | | | | | |
| Permethrin | | | * | | * | |
| Phorate | | | | | * | |
| Thiodicarb | | | | | * | |
| Tralomethrin | | | | | | |
| Zeta-cypermethrin | | | | | * | |
| Fungicides | | | | | | |
| Azoxystrobin | | | | * | | |
| Sulfur | | | | * | | |
| Thiophanate-methyl | | | | * | | |
| Other Chemicals | | | | | | |
| Sodium chlorate | | | | | | |

P Usage data are published for this active ingredient.
* Usage data are not published for this active ingredient.

## Soybeans: Pesticide, Planted Acreage, Percent of Area Receiving Applications and Total Applied, Program States and Total, 2002

| State | Planted Acreage | Area Receiving and Total Applied | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Herbicide | | Insecticide | | Fungicide | | Other | |
| | *1,000 Acres* | *Pct* | *1,000 Lbs* | *Pct* | *1,000 Lbs* | *Pct* | *1,000 Lbs* | *Pct* | *1,000 Lbs* |
| AR [1] | 2,950 | 90 | 2,945 | 14 | 112 | | | | |
| IL [1] | 10,550 | 100 | 12,939 | | | | | | |
| IN [1] | 5,800 | 100 | 7,853 | | | | | | |
| IA | 10,400 | 99 | 13,143 | 9 | 58 | | | | |
| KS [1] | 2,750 | 98 | 2,931 | | | | | | |
| KY | 1,290 | 100 | 1,479 | | | | | | |
| LA | 790 | 98 | 1,257 | 72 | 470 | 14 | 8 | | |
| MD | 490 | 98 | 753 | 3 | | | | | |
| MI [1] | 2,050 | 98 | 2,496 | | | | | | |
| MN [1] | 7,200 | 99 | 7,073 | | | | | | |
| MS [1] | 1,440 | 98 | 2,392 | 24 | 24 | | | | |
| MO | 5,050 | 99 | 5,924 | | | | | | |
| NE | 4,700 | 100 | 6,014 | 4 | 36 | | | | |
| NC | 1,360 | 95 | 1,361 | 25 | 89 | | | | |
| ND [1] | 2,670 | 100 | 3,350 | | | | | | |
| OH [1] | 4,750 | 100 | 6,365 | | | | | | |
| SD | 4,250 | 100 | 5,117 | 19 | 97 | | | | |
| TN [1] | 1,160 | 100 | 1,496 | 10 | 1 | | | | |
| VA | 480 | 94 | 591 | 46 | 25 | | | | |
| WI [1] | 1,540 | 86 | 1,253 | | | | | | |
| Total [1] | 71,670 | 99 | 86,742 | 6 | 1,077 | * | 108 | | |

* Applied on less than one percent of acres.
[1] Insufficient reports to publish data for one or more pesticide classes.

## Soybeans: Agricultural Chemical Applications, Program States, 2002 [1]

| Active Ingredient | Area Applied | Appli-cations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| 2,4-D | 5 | 1.0 | 0.40 | 0.40 | 1,344 |
| 2,4-DB, Dimeth. Salt | * | 1.1 | 0.03 | 0.04 | 3 |
| Acetamide | * | 1.0 | 0.17 | 0.17 | 22 |
| Acetic acid | 1 | 1.0 | 0.40 | 0.40 | 328 |
| Acifluorfen | 2 | 1.0 | 0.25 | 0.26 | 325 |
| Alachlor | * | 1.0 | 1.25 | 1.27 | 802 |
| Bentazon | 2 | 1.0 | 0.96 | 0.96 | 1,138 |
| Carfentrazone-ethyl | * | 1.0 | 0.004 | 0.004 | 1 |
| Chlorimuron-ethyl | 6 | 1.0 | 0.02 | 0.02 | 76 |
| Clethodim | 2 | 1.0 | 0.08 | 0.08 | 145 |
| Clomazone | * | 1.0 | 0.32 | 0.32 | 106 |
| Cloransulam-methyl | 5 | 1.0 | 0.02 | 0.02 | 71 |
| Ethalfluralin | * | 1.0 | 0.80 | 0.80 | 69 |
| Fenoxaprop | 2 | 1.0 | 0.13 | 0.13 | 215 |
| Fluazifop-P-butyl | 3 | 1.0 | 0.06 | 0.06 | 107 |
| Flumetsulam | * | 1.0 | 0.04 | 0.04 | 12 |
| Flumiclorac-pentyl | * | 1.0 | 0.03 | 0.03 | 16 |
| Flumioxazin | * | 1.0 | 0.07 | 0.07 | 18 |
| Fomesafen | 3 | 1.0 | 0.24 | 0.24 | 546 |
| Glyphosate | 78 | 1.4 | 0.74 | 1.07 | 59,962 |
| Glyphosate diam salt | 5 | 1.4 | 0.70 | 1.00 | 3,854 |
| Imazamox | 2 | 1.0 | 0.03 | 0.03 | 47 |
| Imazaquin | 1 | 1.0 | 0.08 | 0.08 | 82 |
| Imazaquin, sod. salt | * | 1.0 | 0.06 | 0.06 | 2 |
| Imazethapyr | 9 | 1.0 | 0.05 | 0.05 | 341 |
| Lactofen | * | 1.0 | 0.08 | 0.09 | 60 |
| Metolachlor | * | 1.0 | 1.47 | 1.47 | 573 |
| Metribuzin | 3 | 1.0 | 0.22 | 0.23 | 440 |
| Paraquat | 2 | 1.1 | 0.41 | 0.48 | 612 |
| Pendimethalin | 9 | 1.0 | 0.94 | 0.95 | 6,132 |
| Quizalofop-P-ethyl | * | 1.0 | 0.06 | 0.06 | 25 |
| S-Metolachlor | 2 | 1.0 | 1.12 | 1.14 | 1,355 |
| Sethoxydim | 2 | 1.0 | 0.30 | 0.30 | 460 |
| Sulfentrazone | 6 | 1.0 | 0.13 | 0.13 | 531 |
| Sulfosate | 1 | 1.5 | 1.11 | 1.67 | 1,575 |
| Thifensulfuron | 2 | 1.0 | 0.003 | 0.004 | 4 |
| Tribenuron-methyl | * | 1.1 | 0.005 | 0.006 | 2 |
| Trifluralin | 7 | 1.0 | 0.92 | 0.93 | 4,385 |

See footnote(s) at end of table.

--continued

## Soybeans: Agricultural Chemical Applications, Program States, 2002 [1]

| Active Ingredient | Area Applied | Appli-cations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Insecticides | | | | | |
| Benzoic acid | * | 1.0 | 0.06 | 0.06 | 13 |
| Carbaryl | * | 1.2 | 0.88 | 1.07 | 73 |
| Chlorpyrifos | * | 1.0 | 0.62 | 0.63 | 187 |
| Diflubenzuron | * | 1.0 | 0.04 | 0.04 | 5 |
| Dimethoate | * | 1.1 | 0.38 | 0.44 | 47 |
| Esfenvalerate | * | 1.1 | 0.03 | 0.03 | 11 |
| Lambda-cyhalothrin | 2 | 1.0 | 0.02 | 0.02 | 31 |
| Methyl parathion | * | 1.3 | 0.59 | 0.78 | 382 |
| Permethrin | * | 1.0 | 0.07 | 0.08 | 54 |
| Thiodicarb | * | 1.2 | 0.32 | 0.41 | 68 |
| Zeta-cypermethrin | * | 1.0 | 0.04 | 0.04 | 17 |
| Fungicides | | | | | |
| Azoxystrobin | * | 1.0 | 0.07 | 0.07 | 25 |

* Area applied is less than one percent.
[1] Planted acres in 2002 for the 20 program states were 71.7 million acres.
States included are AR, IL, IN, IA, KS, KY, LA, MD, MI, MN, MS, MO, NE, NC, ND, OH, SD, TN, VA and WI.

## Soybeans: Agricultural Chemical Applications, Arkansas, 2002 [1]

| Active Ingredient | Area Applied | Appli-cations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| Glyphosate | 80 | 1.6 | 0.63 | 1.04 | 2,447 |

[1] Planted acres in 2002 for Arkansas were 2.95 million acres.

## Soybeans: Agricultural Chemical Applications, Illinois, 2002 [1]

| Active Ingredient | Area Applied | Appli-cations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| 2,4-D | 13 | 1.0 | 0.38 | 0.38 | 518 |
| Acetic acid | 3 | 1.0 | 0.44 | 0.44 | 162 |
| Acifluorfen | 2 | 1.0 | 0.16 | 0.16 | 35 |
| Chlorimuron-ethyl | 7 | 1.0 | 0.02 | 0.02 | 14 |
| Clethodim | 5 | 1.0 | 0.06 | 0.06 | 32 |
| Cloransulam-methyl | 5 | 1.2 | 0.02 | 0.02 | 11 |
| Fenoxaprop | 3 | 1.0 | 0.12 | 0.12 | 35 |
| Fluazifop-P-butyl | 3 | 1.0 | 0.05 | 0.05 | 18 |
| Fomesafen | 3 | 1.0 | 0.28 | 0.28 | 80 |
| Glyphosate | 81 | 1.4 | 0.73 | 1.02 | 8,803 |
| Glyphosate diam salt | 5 | 1.6 | 0.78 | 1.24 | 618 |
| Imazamox | 6 | 1.0 | 0.03 | 0.03 | 19 |
| Imazethapyr | 10 | 1.0 | 0.05 | 0.05 | 59 |
| Lactofen | 1 | 1.4 | 0.11 | 0.15 | 21 |
| Pendimethalin | 8 | 1.0 | 1.14 | 1.15 | 963 |
| Sulfentrazone | 7 | 1.0 | 0.12 | 0.12 | 92 |
| Tribenuron-methyl | 1 | 1.0 | 0.005 | 0.005 | 1 |
| Trifluralin | 1 | 1.0 | 1.06 | 1.06 | 148 |

[1] Planted acres in 2002 for Illinois were 10.6 million acres.

## Soybeans: Agricultural Chemical Applications, Indiana, 2002 [1]

| Active Ingredient | Area Applied | Appli-cations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| 2,4-D | 8 | 1.0 | 0.30 | 0.30 | 136 |
| Chlorimuron-ethyl | 11 | 1.0 | 0.02 | 0.02 | 11 |
| Fenoxaprop | 5 | 1.0 | 0.15 | 0.15 | 41 |
| Fluazifop-P-butyl | 5 | 1.0 | 0.05 | 0.05 | 13 |
| Fomesafen | 2 | 1.0 | 0.27 | 0.27 | 36 |
| Glyphosate | 89 | 1.4 | 0.84 | 1.22 | 6,273 |
| Glyphosate diam salt | 9 | 1.1 | 0.80 | 0.93 | 470 |
| Imazaquin | 4 | 1.0 | 0.07 | 0.07 | 17 |
| Imazethapyr | 10 | 1.0 | 0.06 | 0.06 | 33 |
| Metribuzin | 5 | 1.0 | 0.16 | 0.16 | 46 |
| Pendimethalin | 4 | 1.0 | 0.92 | 0.92 | 208 |
| Sulfentrazone | 7 | 1.0 | 0.11 | 0.11 | 41 |

[1] Planted acres in 2002 for Indiana were 5.80 million acres.

## Soybeans: Agricultural Chemical Applications, Iowa, 2002 [1]

| Active Ingredient | Area Applied | Appli-cations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| Acifluorfen | 4 | 1.0 | 0.16 | 0.16 | 61 |
| Chlorimuron-ethyl | 5 | 1.0 | 0.009 | 0.009 | 5 |
| Cloransulam-methyl | 10 | 1.0 | 0.02 | 0.02 | 23 |
| Fenoxaprop | 4 | 1.0 | 0.12 | 0.13 | 53 |
| Fluazifop-P-butyl | 4 | 1.0 | 0.04 | 0.04 | 18 |
| Fomesafen | 6 | 1.0 | 0.25 | 0.25 | 168 |
| Glyphosate | 73 | 1.3 | 0.71 | 0.99 | 7,497 |
| Glyphosate diam salt | 3 | 1.1 | 0.79 | 0.94 | 259 |
| Imazethapyr | 11 | 1.0 | 0.06 | 0.06 | 68 |
| Pendimethalin | 19 | 1.0 | 0.93 | 0.94 | 1,857 |
| Sethoxydim | 3 | 1.0 | 0.22 | 0.22 | 75 |
| Sulfentrazone | 5 | 1.0 | 0.22 | 0.22 | 113 |
| Trifluralin | 18 | 1.0 | 0.89 | 0.91 | 1,679 |
| Insecticides | | | | | |
| Permethrin | 4 | 1.0 | 0.08 | 0.08 | 38 |

[1] Planted acres in 2002 for Iowa were 10.4 million acres.

## Soybeans: Agricultural Chemical Applications, Kansas, 2002 [1]

| Active Ingredient | Area Applied | Appli-cations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| 2,4-D | 7 | 1.0 | 0.33 | 0.33 | 64 |
| Glyphosate | 82 | 1.4 | 0.67 | 0.96 | 2,171 |
| Glyphosate diam salt | 7 | 1.4 | 0.58 | 0.82 | 157 |
| Imazethapyr | 5 | 1.0 | 0.05 | 0.05 | 7 |
| Metribuzin | 7 | 1.2 | 0.20 | 0.25 | 47 |
| Pendimethalin | 8 | 1.0 | 0.94 | 0.94 | 194 |

[1] Planted acres in 2002 for Kansas were 2.75 million acres.

## Soybeans: Agricultural Chemical Applications, Kentucky, 2002 [1]

| Active Ingredient | Area Applied | Appli-cations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| 2,4-D | 11 | 1.0 | 0.44 | 0.44 | 63 |
| Glyphosate | 87 | 1.3 | 0.80 | 1.08 | 1,213 |
| Imazethapyr | 7 | 1.0 | 0.04 | 0.04 | 4 |

[1] Planted acres in 2002 for Kentucky were 1.29 million acres.

## Soybeans: Agricultural Chemical Applications, Louisiana, 2002 [1]

| Active Ingredient | Area Applied | Appli-cations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| Acifluorfen | 2 | 1.4 | 0.33 | 0.47 | 8 |
| Chlorimuron-ethyl | 12 | 1.2 | 0.02 | 0.02 | 2 |
| Glyphosate | 77 | 1.9 | 0.77 | 1.54 | 937 |
| Imazaquin | 6 | 1.0 | 0.09 | 0.09 | 4 |
| Paraquat | 6 | 1.0 | 0.34 | 0.34 | 18 |
| Pendimethalin | 3 | 1.0 | 0.87 | 0.87 | 22 |
| Sulfosate | 8 | 1.8 | 1.04 | 1.92 | 119 |
| Insecticides | | | | | |
| Benzoic acid | 15 | 1.1 | 0.06 | 0.07 | 8 |
| Diflubenzuron | 9 | 1.0 | 0.04 | 0.04 | 3 |
| Lambda-cyhalothrin | 3 | 1.0 | 0.03 | 0.03 | 1 |
| Methyl parathion | 56 | 1.3 | 0.60 | 0.82 | 360 |
| Thiodicarb | 12 | 1.5 | 0.37 | 0.57 | 56 |
| Zeta-cypermethrin | 10 | 1.1 | 0.04 | 0.05 | 4 |
| Fungicides | | | | | |
| Azoxystrobin | 14 | 1.0 | 0.07 | 0.07 | 8 |

[1] Planted acres in 2002 for Louisiana were 790,000 acres.

## Soybeans: Agricultural Chemical Applications, Maryland, 2002 [1]

| Active Ingredient | Area Applied | Appli-cations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| Glyphosate | 72 | 1.3 | 0.99 | 1.36 | 482 |
| Glyphosate diam salt | 20 | 1.0 | 0.64 | 0.68 | 65 |
| Paraquat | 11 | 1.0 | 0.41 | 0.41 | 23 |

[1] Planted acres in 2002 for Maryland were 490,000 acres.

## Soybeans: Agricultural Chemical Applications, Michigan, 2002 [1]

| Active Ingredient | Area Applied | Appli-cations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| Glyphosate | 82 | 1.2 | 0.86 | 1.06 | 1,791 |
| Glyphosate diam salt | 9 | 1.3 | 0.71 | 0.92 | 163 |
| Imazethapyr | 12 | 1.0 | 0.06 | 0.06 | 14 |

[1] Planted acres in 2002 for Michigan were 2.05 million acres.

## Soybeans: Agricultural Chemical Applications, Minnesota, 2002 [1]

| Active Ingredient | Area Applied | Appli-cations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| Fenoxaprop | 4 | 1.0 | 0.10 | 0.10 | 30 |
| Fluazifop-P-butyl | 4 | 1.0 | 0.04 | 0.04 | 13 |
| Fomesafen | 7 | 1.0 | 0.20 | 0.20 | 95 |
| Glyphosate | 70 | 1.2 | 0.74 | 0.90 | 4,516 |
| Glyphosate diam salt | 9 | 1.7 | 0.67 | 1.16 | 732 |
| Imazamox | 6 | 1.0 | 0.02 | 0.02 | 10 |
| Imazethapyr | 10 | 1.0 | 0.05 | 0.05 | 38 |
| Pendimethalin | 9 | 1.0 | 0.91 | 0.91 | 561 |
| Thifensulfuron | 2 | 1.0 | 0.003 | 0.003 | ( [2] ) |
| Trifluralin | 14 | 1.0 | 0.77 | 0.77 | 761 |

[1] Planted acres in 2002 for Minnesota were 7.20 million acres.
[2] Total applied is less than 1,000 lbs.

## Soybeans: Agricultural Chemical Applications, Mississippi, 2002 [1]

| Active Ingredient | Area Applied | Appli-cations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| 2,4-D | 6 | 1.0 | 0.84 | 0.84 | 78 |
| Acifluorfen | 7 | 1.3 | 0.20 | 0.27 | 26 |
| Chlorimuron-ethyl | 4 | 1.4 | 0.005 | 0.008 | 1 |
| Cloransulam-methyl | 2 | 1.0 | 0.02 | 0.02 | ( [2] ) |
| Glyphosate | 86 | 2.2 | 0.71 | 1.62 | 2,013 |
| Imazaquin | 6 | 1.0 | 0.09 | 0.09 | 8 |
| Pendimethalin | 4 | 1.0 | 0.89 | 0.89 | 50 |
| Trifluralin | 3 | 1.0 | 0.98 | 1.04 | 42 |
| Insecticides | | | | | |
| Benzoic acid | 6 | 1.0 | 0.05 | 0.05 | 5 |
| Lambda-cyhalothrin | 13 | 1.1 | 0.02 | 0.03 | 5 |
| Methyl parathion | 2 | 1.1 | 0.36 | 0.40 | 10 |
| Fungicides | | | | | |
| Azoxystrobin | 9 | 1.0 | 0.06 | 0.06 | 8 |

[1] Planted acres in 2002 for Mississippi were 1.44 million acres.
[2] Total applied is less than 1,000 lbs.

## Soybeans: Agricultural Chemical Applications, Missouri, 2002 [1]

| Active Ingredient | Area Applied | Applications | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| 2,4-D | 6 | 1.0 | 0.52 | 0.52 | 160 |
| Chlorimuron-ethyl | 8 | 1.2 | 0.02 | 0.02 | 9 |
| Cloransulam-methyl | 9 | 1.0 | 0.02 | 0.02 | 9 |
| Flumiclorac-pentyl | 3 | 1.0 | 0.04 | 0.04 | 6 |
| Glyphosate | 84 | 1.3 | 0.77 | 1.03 | 4,328 |
| Glyphosate diam salt | 6 | 1.2 | 0.78 | 0.95 | 279 |
| Paraquat | 4 | 1.8 | 0.35 | 0.63 | 122 |
| Sulfentrazone | 11 | 1.0 | 0.14 | 0.14 | 77 |

[1] Planted acres in 2002 for Missouri were 5.05 million acres.

## Soybeans: Agricultural Chemical Applications, Nebraska, 2002 [1]

| Active Ingredient | Area Applied | Applications | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| Alachlor | 3 | 1.0 | 1.17 | 1.17 | 192 |
| Chlorimuron-ethyl | 6 | 1.0 | 0.02 | 0.02 | 6 |
| Glyphosate | 78 | 1.3 | 0.73 | 1.00 | 3,661 |
| Glyphosate diam salt | 13 | 1.5 | 0.67 | 1.04 | 631 |
| Imazethapyr | 14 | 1.0 | 0.05 | 0.05 | 35 |
| Metribuzin | 3 | 1.0 | 0.26 | 0.26 | 33 |
| Pendimethalin | 17 | 1.0 | 0.85 | 0.86 | 671 |
| S-Metolachlor | 4 | 1.0 | 0.77 | 0.77 | 162 |
| Trifluralin | 5 | 1.0 | 0.72 | 0.72 | 166 |
| Insecticides | | | | | |
| Chlorpyrifos | * | 1.1 | 0.52 | 0.59 | 26 |

* Area applied is less than one percent.
[1] Planted acres in 2002 for Nebraska were 4.70 million acres.

## Soybeans: Agricultural Chemical Applications, North Carolina, 2002 [1]

| Active Ingredient | Area Applied | Applications | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| Glyphosate | 91 | 1.3 | 0.71 | 0.98 | 1,208 |
| Imazethapyr | 5 | 1.0 | 0.04 | 0.04 | 3 |
| Paraquat | 14 | 1.0 | 0.39 | 0.39 | 77 |
| Pendimethalin | 3 | 1.0 | 0.53 | 0.53 | 22 |
| Insecticides | | | | | |
| Esfenvalerate | 4 | 1.0 | 0.03 | 0.03 | 2 |
| Lambda-cyhalothrin | 14 | 1.0 | 0.02 | 0.02 | 4 |

[1] Planted acres in 2002 for North Carolina were 1.36 million acres.

## Soybeans: Agricultural Chemical Applications, North Dakota, 2002 [1]

| Active Ingredient | Area Applied | Appli-cations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| Bentazon | 24 | 1.0 | 1.48 | 1.48 | 939 |
| Ethalfluralin | 3 | 1.0 | 0.80 | 0.80 | 69 |
| Glyphosate | 50 | 1.5 | 0.60 | 0.90 | 1,202 |
| Imazamox | 10 | 1.0 | 0.03 | 0.03 | 8 |
| Imazethapyr | 15 | 1.0 | 0.04 | 0.04 | 17 |
| Pendimethalin | 11 | 1.0 | 1.24 | 1.24 | 367 |
| Sethoxydim | 25 | 1.0 | 0.36 | 0.36 | 240 |
| Trifluralin | 15 | 1.0 | 0.94 | 0.94 | 369 |

[1] Planted acres in 2002 for North Dakota were 2.67 million acres.

## Soybeans: Agricultural Chemical Applications, Ohio, 2002 [1]

| Active Ingredient | Area Applied | Appli-cations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| 2,4-D | 4 | 1.0 | 0.53 | 0.53 | 106 |
| Chlorimuron-ethyl | 16 | 1.0 | 0.02 | 0.02 | 16 |
| Glyphosate | 89 | 1.6 | 0.80 | 1.30 | 5,480 |
| Glyphosate diam salt | 3 | 1.5 | 0.66 | 1.04 | 172 |
| Imazethapyr | 4 | 1.0 | 0.05 | 0.05 | 10 |
| Metribuzin | 8 | 1.0 | 0.22 | 0.22 | 79 |
| Pendimethalin | 3 | 1.0 | 0.68 | 0.68 | 96 |
| Sulfentrazone | 14 | 1.0 | 0.08 | 0.08 | 58 |

[1] Planted acres in 2002 for Ohio were 4.75 million acres.

## Soybeans: Agricultural Chemical Applications, South Dakota, 2002 [1]

| Active Ingredient | Area Applied | Appli-cations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| Glyphosate | 72 | 1.5 | 0.71 | 1.10 | 3,359 |
| Glyphosate diam salt | 3 | 1.4 | 0.68 | 0.95 | 120 |
| Pendimethalin | 9 | 1.0 | 0.99 | 0.99 | 371 |
| Insecticides | | | | | |
| Lambda-cyhalothrin | 12 | 1.0 | 0.02 | 0.02 | 10 |

[1] Planted acres in 2002 for South Dakota were 4.25 million acres.

## Soybeans: Agricultural Chemical Applications, Tennessee, 2002 [1]

| Active Ingredient | Area Applied | Appli-cations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| Chlorimuron-ethyl | 15 | 1.0 | 0.006 | 0.007 | 1 |
| Clethodim | 13 | 1.0 | 0.12 | 0.12 | 18 |
| Fluazifop-P-butyl | 4 | 1.0 | 0.11 | 0.11 | 5 |
| Glyphosate | 95 | 1.5 | 0.71 | 1.13 | 1,242 |
| Paraquat | 2 | 1.0 | 0.40 | 0.40 | 12 |
| Insecticides | | | | | |
| Lambda-cyhalothrin | 10 | 1.0 | 0.01 | 0.01 | 2 |

[1] Planted acres in 2002 for Tennessee were 1.16 million acres.

## Soybeans: Agricultural Chemical Applications, Virginia, 2002 [1]

| Active Ingredient | Area Applied | Appli-cations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| Chlorimuron-ethyl | 7 | 1.0 | 0.03 | 0.03 | 1 |
| Fluazifop-P-butyl | 11 | 1.1 | 0.18 | 0.20 | 11 |
| Fomesafen | 10 | 1.1 | 0.35 | 0.39 | 20 |
| Glyphosate | 83 | 1.4 | 0.72 | 1.04 | 415 |
| Imazethapyr | 4 | 1.0 | 0.05 | 0.05 | 1 |
| Paraquat | 8 | 1.0 | 0.53 | 0.53 | 22 |
| Pendimethalin | 8 | 1.2 | 0.59 | 0.71 | 26 |
| Sulfentrazone | 6 | 1.0 | 0.17 | 0.17 | 5 |
| Insecticides | | | | | |
| Lambda-cyhalothrin | 17 | 1.2 | 0.02 | 0.03 | 2 |

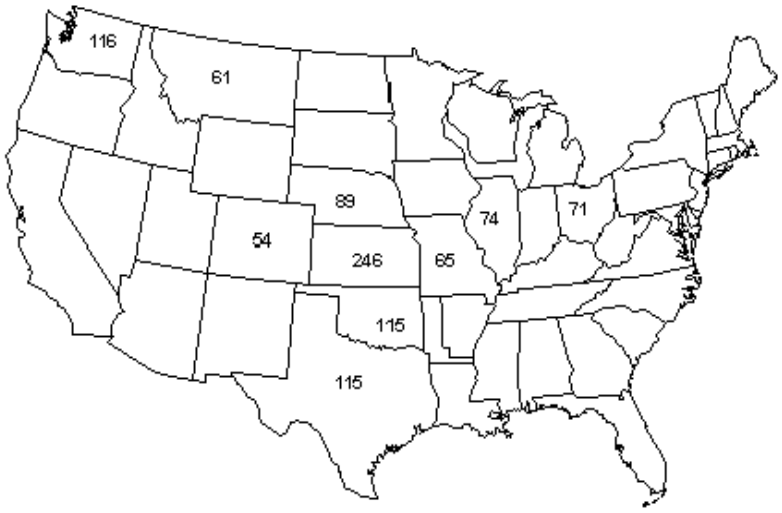
[1] Planted acres in 2002 for Virginia were 480,000 acres.

## Soybeans: Agricultural Chemical Applications, Wisconsin, 2002 [1]

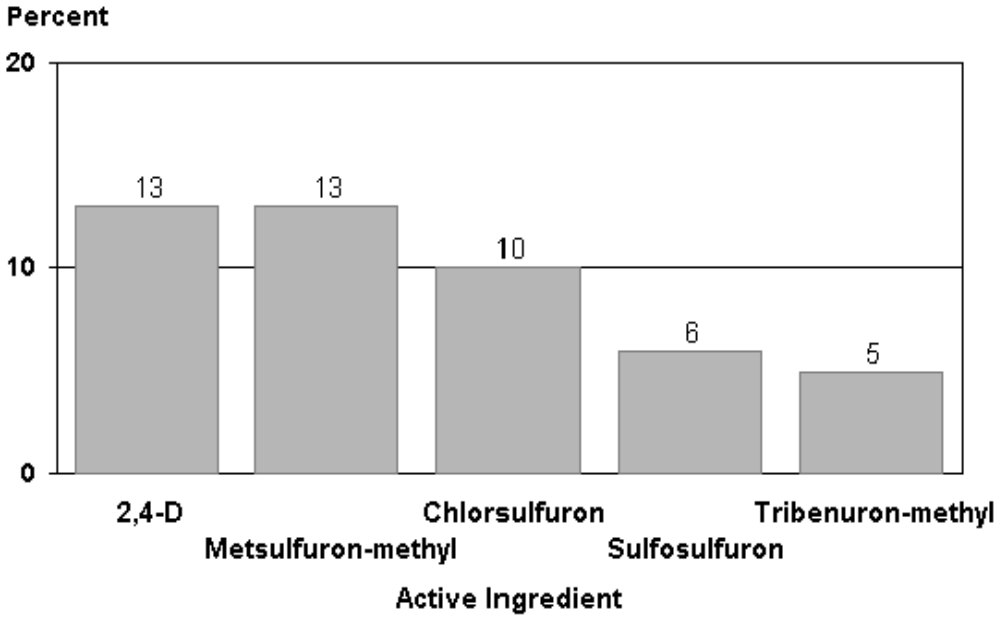
| Active Ingredient | Area Applied | Appli-cations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| 2,4-D | 5 | 1.0 | 0.42 | 0.42 | 34 |
| Glyphosate | 65 | 1.3 | 0.67 | 0.92 | 924 |
| Glyphosate diam salt | 4 | 1.2 | 0.58 | 0.73 | 48 |
| Imazamox | 5 | 1.0 | 0.04 | 0.04 | 3 |
| Imazethapyr | 27 | 1.0 | 0.04 | 0.04 | 18 |
| Pendimethalin | 11 | 1.0 | 0.88 | 0.88 | 154 |

[1] Planted acres in 2002 for Wisconsin were 1.54 million acres.

## Winter Wheat: Number of Usable Reports, 2002




## Winter Wheat: Percent of Acres Treated
Top 5 Active Ingredients for 2002




Surveyed states are CO, IL, KS, MO, MT, NE, OH, OK, TX, and WA

## Winter Wheat: Fertilizer Use by State, 2002
## Percent of Acres Treated and Total Amount Applied

| State | Harvested Acreage | Percent of Acres Treated and Total Applied | | | | | |
|---|---|---|---|---|---|---|---|
| | | Nitrogen | | Phosphate | | Potash | |
| | *1,000 Acres* | *Pct* | *Mil. Lbs* | *Pct* | *Mil. Lbs* | *Pct* | *Mil. Lbs* |
| CO | 1,650 | 64 | 55.1 | 31 | 18.2 | * | 0.0 |
| IL | 650 | 96 | 59.4 | 76 | 37.0 | 74 | 46.8 |
| KS | 8,100 | 91 | 487.4 | 64 | 162.2 | 8 | 24.5 |
| MO | 760 | 97 | 65.9 | 75 | 31.8 | 74 | 40.8 |
| MT | 750 | 88 | 38.4 | 81 | 18.5 | 46 | 4.8 |
| NE | 1,520 | 79 | 57.6 | 45 | 22.6 | 4 | 2.1 |
| OH | 810 | 98 | 66.4 | 89 | 46.8 | 88 | 51.4 |
| OK | 3,500 | 92 | 203.6 | 59 | 65.9 | 4 | 6.4 |
| TX | 2,700 | 62 | 124.0 | 28 | 30.3 | 7 | 5.4 |
| WA | 1,750 | 99 | 126.5 | 39 | 12.3 | 11 | 3.5 |
| Total | 22,190 | 86 | 1,284.3 | 55 | 445.6 | 15 | 185.7 |

## Winter Wheat: Fertilizer Primary Nutrient Applications, Program States and Total, 2002

| Primary Nutrient | Harvested Acreage | Area Applied | Applic-ations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|---|
| | *1,000 Acres* | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *Mil. Lbs* |
| Colorado | 1,650 | | | | | |
| Nitrogen | | 64 | 1.2 | 44 | 53 | 55.1 |
| Phosphate | | 31 | 1.0 | 35 | 35 | 18.2 |
| Potash | | 0 | 0.0 | | | 0.0 |
| Illinois | 650 | | | | | |
| Nitrogen | | 96 | 1.7 | 54 | 95 | 59.4 |
| Phosphate | | 76 | 1.0 | 73 | 75 | 37.0 |
| Potash | | 74 | 1.0 | 97 | 97 | 46.8 |
| Kansas | 8,100 | | | | | |
| Nitrogen | | 91 | 1.4 | 45 | 66 | 487.4 |
| Phosphate | | 64 | 1.0 | 31 | 31 | 162.2 |
| Potash | | 8 | 1.0 | 36 | 36 | 24.5 |
| Missouri | 760 | | | | | |
| Nitrogen | | 97 | 1.6 | 53 | 89 | 65.9 |
| Phosphate | | 75 | 1.0 | 55 | 55 | 31.8 |
| Potash | | 74 | 1.0 | 73 | 73 | 40.8 |
| Montana | 750 | | | | | |
| Nitrogen | | 88 | 1.5 | 39 | 58 | 38.4 |
| Phosphate | | 81 | 1.0 | 30 | 30 | 18.5 |
| Potash | | 46 | 1.0 | 13 | 14 | 4.8 |
| Nebraska | 1,520 | | | | | |
| Nitrogen | | 79 | 1.4 | 34 | 48 | 57.6 |
| Phosphate | | 45 | 1.0 | 33 | 33 | 22.6 |
| Potash | | 4 | 1.0 | 31 | 31 | 2.1 |
| Ohio | 810 | | | | | |
| Nitrogen | | 98 | 1.8 | 46 | 84 | 66.4 |
| Phosphate | | 89 | 1.0 | 60 | 65 | 46.8 |
| Potash | | 88 | 1.0 | 71 | 72 | 51.4 |
| Oklahoma | 3,500 | | | | | |
| Nitrogen | | 92 | 1.5 | 41 | 64 | 203.6 |
| Phosphate | | 59 | 1.0 | 32 | 32 | 65.9 |
| Potash | | 4 | 1.0 | 41 | 41 | 6.4 |
| Texas | 2,700 | | | | | |
| Nitrogen | | 62 | 1.4 | 52 | 74 | 124.0 |
| Phosphate | | 28 | 1.0 | 38 | 40 | 30.3 |
| Potash | | 7 | 1.0 | 29 | 29 | 5.4 |
| Washington | 1,750 | | | | | |
| Nitrogen | | 99 | 1.3 | 53 | 73 | 126.5 |
| Phosphate | | 39 | 1.0 | 17 | 18 | 12.3 |
| Potash | | 11 | 1.0 | 18 | 18 | 3.5 |

## Winter Wheat: Fertilizer Primary Nutrient Applications, Program States and Total, 2002

| Primary Nutrient | Harvested Acreage | Area Applied | Applic-ations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|---|
| | *1,000 Acres* | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *Mil. Lbs* |
| Total | 22,190 | | | | | |
| Nitrogen | | 86 | 1.5 | 45 | 68 | 1,284.3 |
| Phosphate | | 55 | 1.0 | 36 | 37 | 445.6 |
| Potash | | 15 | 1.0 | 53 | 54 | 185.7 |

## Winter Wheat: Active Ingredients and Publication Status By Program States, 2002

| Active Ingredient | Program States | | | | | |
|---|---|---|---|---|---|---|
| | ALL | CO | IL | KS | MO | MT |
| Herbicides | | | | | | |
| 2,4-D | P | * | * | P | * | P |
| 2,4-DP, Dimeth. salt | * | | | * | | |
| Acetic acid | P | | | | | * |
| Atrazine | * | | | | | |
| Bromoxynil | P | | | | | * |
| Carfentrazone-ethyl | * | | | | | * |
| Chlorsulfuron | P | | | P | | * |
| Clopyralid | * | | | | | * |
| Dicamba | P | * | * | P | | P |
| Diclofop-methyl | * | | | | | |
| Difenzoquat | * | | | | | |
| Fenoxaprop | * | | | | | * |
| Flucarbazone-sodium | * | | | | | |
| Fluroxypyr | * | | | | | * |
| Fluroxypyr 1-methylh | P | | | | | * |
| Glyphosate | P | * | | P | | P |
| Imazamethabenz | * | | | | | |
| MCPA | P | | | * | | * |
| Metribuzin | P | | | * | * | |
| Metsulfuron-methyl | P | * | | P | | P |
| Paraquat | * | | | | | |
| Picloram | P | | | | | P |
| Prosulfuron | P | | | * | | |
| Sulfosulfuron | P | | | P | | |
| Thifensulfuron | P | | P | * | P | |
| Tralkoxydim | * | | | | | * |
| Triallate | * | | | | | * |
| Triasulfuron | P | * | | P | | P |
| Tribenuron-methyl | P | | P | * | P | * |
| Trifluralin | * | | | | | |
| Insecticides | | | | | | |
| Chlorpyrifos | P | | | * | | * |
| Dimethoate | P | * | | * | | |
| Disulfoton | * | | * | | * | |
| Imidacloprid | * | | | | | |
| Lambda-cyhalothrin | P | | * | * | * | |
| Malathion | * | | | | | |
| Methyl parathion | P | | | | | |
| Zeta-cypermethrin | P | | | P | | |

See footnote(s) at end of table.

--continued

## Winter Wheat: Active Ingredients and Publication Status By Program States, 2002

| Active Ingredient | Program States | | | | | |
|---|---|---|---|---|---|---|
| | ALL | CO | IL | KS | MO | MT |
| Fungicides | | | | | | |
| Mancozeb | * | | | | | |
| Propiconazole | P | | * | | * | |
| Thiophanate-methyl | * | | | | | |
| Trifloxystrobin | * | | | | | |

See footnote(s) at end of table.

--continued

**Winter Wheat: Active Ingredients**
**Publication Status**
**By Program States, 2002 (continued)**

| Active Ingredient | Program States | | | | |
|---|---|---|---|---|---|
| | NE | OH | OK | TX | WA |
| Herbicides | | | | | |
| 2,4-D | P | P | P | P | P |
| 2,4-DP, Dimeth. salt | | | | | |
| Acetic acid | | * | * | | * |
| Atrazine | * | | | | * |
| Bromoxynil | | | | | P |
| Carfentrazone-ethyl | | | | | * |
| Chlorsulfuron | * | | P | * | P |
| Clopyralid | | | | | * |
| Dicamba | P | * | | | * |
| Diclofop-methyl | | | | | * |
| Difenzoquat | | | | | * |
| Fenoxaprop | | | | | * |
| Flucarbazone-sodium | | | | | * |
| Fluroxypyr | | | | | * |
| Fluroxypyr 1-methylh | | | | | * |
| Glyphosate | * | | * | * | P |
| Imazamethabenz | | | | | * |
| MCPA | | P | * | | P |
| Metribuzin | | | | | P |
| Metsulfuron-methyl | P | | P | P | P |
| Paraquat | * | | | | |
| Picloram | | | | | |
| Prosulfuron | * | * | | * | P |
| Sulfosulfuron | * | | P | | P |
| Thifensulfuron | * | P | | | P |
| Tralkoxydim | | | | | |
| Triallate | | | | | * |
| Triasulfuron | P | | | P | P |
| Tribenuron-methyl | * | P | | * | P |
| Trifluralin | | | | * | |
| Insecticides | | | | | |
| Chlorpyrifos | | | P | P | |
| Dimethoate | | | P | P | * |
| Disulfoton | | | | | |
| Imidacloprid | | | | * | |
| Lambda-cyhalothrin | * | | * | | |
| Malathion | | | * | * | |
| Methyl parathion | | | P | | |
| Zeta-cypermethrin | * | | * | | |

See footnote(s) at end of table. --continued

**Winter Wheat: Active Ingredients**
**Publication Status**
**By Program States, 2002 (continued)**

| Active Ingredient | Program States | | | | |
|---|---|---|---|---|---|
| | NE | OH | OK | TX | WA |
| Fungicides | | | | | |
| Mancozeb | | | | | * |
| Propiconazole | * | | | | * |
| Thiophanate-methyl | | | | | * |
| Trifloxystrobin | | | | | * |

P Usage data are published for this active ingredient.
* Usage data are not published for this active ingredient.

## Winter Wheat: Pesticide, Harvested Acreage, Percent of Area Receiving Applications and Total Applied, Program States and Total, 2002

| State | Harvested Acreage | Area Receiving and Total Applied | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Herbicide | | Insecticide | | Fungicide | | Other | |
| | *1,000 Acres* | *Pct* | *1,000 Lbs* | *Pct* | *1,000 Lbs* | *Pct* | *1,000 Lbs* | *Pct* | *1,000 Lbs* |
| CO [1] | 1,650 | 12 | 68 | | | | | | |
| IL [1] | 650 | 39 | 10 | | | | | | |
| KS | 8,100 | 32 | 347 | 7 | 30 | | | | |
| MO [1] | 760 | 12 | 12 | | | | | | |
| MT [1] | 750 | 80 | 433 | | | | | | |
| NE [1] | 1,520 | 49 | 225 | | | | | | |
| OH | 810 | 31 | 72 | | | | | | |
| OK | 3,500 | 36 | 155 | 32 | 285 | | | | |
| TX | 2,700 | 34 | 274 | 21 | 291 | | | | |
| WA [1] | 1,750 | 87 | 856 | | | 3 | 37 | | |
| Total | 22,190 | 38 | 2,456 | 11 | 665 | * | 42 | | |

* Applied on less than one percent of acres.
[1] Insufficient reports to publish data for one or more pesticide classes.

## Winter Wheat: Agricultural Chemical Applications, Program States, 2002 [1]

| Active Ingredient | Area Applied | Appli-cations | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| 2,4-D | 13 | 1.1 | 0.37 | 0.41 | 1,196 |
| Acetic acid | * | 1.0 | 0.47 | 0.47 | 56 |
| Bromoxynil | 2 | 1.0 | 0.21 | 0.22 | 86 |
| Chlorsulfuron | 10 | 1.0 | 0.01 | 0.01 | 25 |
| Dicamba | 2 | 1.0 | 0.03 | 0.04 | 20 |
| Fluroxypyr 1-methylh | * | 1.0 | 0.10 | 0.10 | 7 |
| Glyphosate | 3 | 1.8 | 0.40 | 0.73 | 541 |
| MCPA | 4 | 1.0 | 0.30 | 0.31 | 241 |
| Metribuzin | 1 | 1.0 | 0.17 | 0.17 | 44 |
| Metsulfuron-methyl | 13 | 1.0 | 0.003 | 0.003 | 9 |
| Picloram | * | 1.0 | 0.02 | 0.02 | 1 |
| Prosulfuron | 1 | 1.0 | 0.01 | 0.01 | 3 |
| Sulfosulfuron | 6 | 1.0 | 0.03 | 0.03 | 39 |
| Thifensulfuron | 4 | 1.0 | 0.01 | 0.01 | 13 |
| Triasulfuron | 4 | 1.0 | 0.01 | 0.01 | 14 |
| Tribenuron-methyl | 5 | 1.0 | 0.006 | 0.007 | 7 |
| Insecticides | | | | | |
| Chlorpyrifos | 3 | 1.0 | 0.42 | 0.43 | 289 |
| Dimethoate | 3 | 1.0 | 0.28 | 0.28 | 156 |
| Lambda-cyhalothrin | * | 1.1 | 0.02 | 0.02 | 3 |
| Methyl parathion | * | 1.1 | 0.36 | 0.41 | 90 |
| Zeta-cypermethrin | 4 | 1.0 | 0.03 | 0.03 | 24 |
| Fungicides | | | | | |
| Propiconazole | * | 1.0 | 0.10 | 0.10 | 11 |

* Area applied is less than one percent.
[1] Harvested acres in 2002 for the 10 program states were 22.2 million acres. States included are CO, IL, KS, MO, MT, NE, OH, OK, TX and WA.

## Winter Wheat: Agricultural Chemical Applications, Illinois, 2002 [1]

| Active Ingredient | Area Applied | Applications | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| Thifensulfuron | 36 | 1.0 | 0.02 | 0.02 | 4 |
| Tribenuron-methyl | 36 | 1.0 | 0.008 | 0.008 | 2 |

[1] Harvested acres in 2002 for Illinois were 650,000 acres.

## Winter Wheat: Agricultural Chemical Applications, Kansas, 2002 [1]

| Active Ingredient | Area Applied | Applications | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| 2,4-D | 6 | 1.1 | 0.31 | 0.36 | 162 |
| Chlorsulfuron | 18 | 1.0 | 0.01 | 0.01 | 16 |
| Dicamba | 3 | 1.1 | 0.02 | 0.02 | 5 |
| Glyphosate | 2 | 2.2 | 0.34 | 0.76 | 131 |
| Metsulfuron-methyl | 16 | 1.0 | 0.002 | 0.002 | 3 |
| Sulfosulfuron | 3 | 1.0 | 0.03 | 0.03 | 9 |
| Triasulfuron | 3 | 1.0 | 0.008 | 0.008 | 2 |
| Insecticides | | | | | |
| Zeta-cypermethrin | 7 | 1.0 | 0.02 | 0.02 | 14 |

[1] Harvested acres in 2002 for Kansas were 8.10 million acres.

## Winter Wheat: Agricultural Chemical Applications, Missouri, 2002 [1]

| Active Ingredient | Area Applied | Applications | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| Thifensulfuron | 12 | 1.0 | 0.02 | 0.02 | 2 |
| Tribenuron-methyl | 11 | 1.0 | 0.009 | 0.009 | 1 |

[1] Harvested acres in 2002 for Missouri were 760,000 acres.

## Winter Wheat: Agricultural Chemical Applications, Montana, 2002 [1]

| Active Ingredient | Area Applied | Applications | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| 2,4-D | 56 | 1.2 | 0.34 | 0.41 | 175 |
| Dicamba | 13 | 1.0 | 0.08 | 0.08 | 8 |
| Glyphosate | 30 | 2.0 | 0.36 | 0.74 | 168 |
| Metsulfuron-methyl | 17 | 1.0 | 0.004 | 0.004 | 1 |
| Picloram | 9 | 1.0 | 0.02 | 0.02 | 1 |
| Triasulfuron | 8 | 1.0 | 0.01 | 0.01 | 1 |

[1] Harvested acres in 2002 for Montana were 750,000 acres.

## Winter Wheat: Agricultural Chemical Applications, Nebraska, 2002 [1]

| Active Ingredient | Area Applied | Applications | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| 2,4-D | 31 | 1.0 | 0.31 | 0.31 | 142 |
| Dicamba | 7 | 1.0 | 0.06 | 0.06 | 6 |
| Metsulfuron-methyl | 13 | 1.0 | 0.004 | 0.004 | 1 |
| Triasulfuron | 14 | 1.0 | 0.02 | 0.02 | 3 |

[1] Harvested acres in 2002 for Nebraska were 1.52 million acres.

## Winter Wheat: Agricultural Chemical Applications, Ohio, 2002 [1]

| Active Ingredient | Area Applied | Applications | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| 2,4-D | 14 | 1.0 | 0.35 | 0.35 | 40 |
| MCPA | 7 | 1.0 | 0.35 | 0.35 | 20 |
| Thifensulfuron | 8 | 1.0 | 0.02 | 0.02 | 1 |
| Tribenuron-methyl | 7 | 1.0 | 0.007 | 0.007 | ( [2] ) |

[1] Harvested acres in 2002 for Ohio were 810,000 acres.
[2] Total applied is less than 1,000 lbs.

## Winter Wheat: Agricultural Chemical Applications, Oklahoma, 2002 [1]

| Active Ingredient | Area Applied | Applications | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| 2,4-D | 8 | 1.1 | 0.30 | 0.33 | 93 |
| Chlorsulfuron | 18 | 1.0 | 0.01 | 0.01 | 7 |
| Metsulfuron-methyl | 19 | 1.0 | 0.003 | 0.003 | 2 |
| Sulfosulfuron | 13 | 1.0 | 0.03 | 0.03 | 14 |
| Insecticides | | | | | |
| Chlorpyrifos | 7 | 1.0 | 0.30 | 0.30 | 78 |
| Dimethoate | 6 | 1.0 | 0.32 | 0.32 | 69 |
| Methyl parathion | 6 | 1.1 | 0.36 | 0.41 | 90 |

[1] Harvested acres in 2002 for Oklahoma were 3.50 million acres.

## Winter Wheat: Agricultural Chemical Applications, Texas, 2002 [1]

| Active Ingredient | Area Applied | Applications | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| 2,4-D | 17 | 1.0 | 0.52 | 0.52 | 233 |
| Metsulfuron-methyl | 7 | 1.0 | 0.004 | 0.004 | 1 |
| Triasulfuron | 13 | 1.0 | 0.02 | 0.02 | 6 |
| Insecticides | | | | | |
| Chlorpyrifos | 13 | 1.0 | 0.51 | 0.54 | 197 |
| Dimethoate | 8 | 1.0 | 0.23 | 0.23 | 49 |

[1] Harvested acres in 2002 for Texas were 2.70 million acres.

## Winter Wheat: Agricultural Chemical Applications, Washington, 2002 [1]

| Active Ingredient | Area Applied | Applications | Rate per Application | Rate per Crop Year | Total Applied |
|---|---|---|---|---|---|
| | *Percent* | *Number* | *Pounds per Acre* | *Pounds per Acre* | *1,000 Lbs* |
| Herbicides | | | | | |
| 2,4-D | 33 | 1.1 | 0.49 | 0.55 | 318 |
| Bromoxynil | 22 | 1.0 | 0.20 | 0.22 | 83 |
| Chlorsulfuron | 7 | 1.0 | 0.01 | 0.01 | 2 |
| Glyphosate | 11 | 1.3 | 0.47 | 0.65 | 127 |
| MCPA | 35 | 1.0 | 0.28 | 0.29 | 179 |
| Metribuzin | 12 | 1.0 | 0.17 | 0.17 | 38 |
| Metsulfuron-methyl | 20 | 1.0 | 0.005 | 0.005 | 2 |
| Prosulfuron | 8 | 1.0 | 0.01 | 0.01 | 2 |
| Sulfosulfuron | 27 | 1.0 | 0.03 | 0.03 | 14 |
| Thifensulfuron | 25 | 1.1 | 0.01 | 0.01 | 5 |
| Triasulfuron | 4 | 1.0 | 0.02 | 0.02 | 1 |
| Tribenuron-methyl | 24 | 1.1 | 0.005 | 0.005 | 2 |

[1] Harvested acres in 2002 for Washington were 1.75 million acres.

## Pest Management Practices - Highlights

The 2002 survey results showed comparatively similar trends compared with 2001 in terms of which pest management practices were reported at high levels for corn and soybeans. Durum, other spring, and winter wheat were last surveyed in 1999 and were published at the all wheat level.

The question for "weather monitoring" changed between 2001 and 2002 for soybeans from monitoring "to predict the need for pesticide application" to monitoring "to determine when to make pesticide applications". Therefore, data between years in not comparable.

The question for "scouting" was also changed between 2001 and 2002 for soybeans from "using a systematic method " to "systematic sampling or counting". Therefore, data between years in not comparable.

**Corn:** Most pest management practices increased from 2001 for corn in the prevention, avoidance, monitoring and suppression categories. The percent of farms reporting prevention practices increased for virtually all practices in the 7 states surveyed.

**Soybeans:** As producers continue to increase the percent of soybean acreage planted to biotech varieties with herbicide resistance (now ranging from 61 - 89 percent of total acres planted in the states surveyed), the need for pest management practices to control weeds declines.

**Wheat, Durum:** Producers in North Dakota reported a high level of scouting at 71 percent of farms. Rotating crops to control pests and cleaning implements after fieldwork were the next two most common practices reported by 68 and 55 percent of farms respectively.

**Wheat Other Spring:** Cleaning implements after fieldwork and rotating crops to control pests were the two most common practices; reported by 67 and 65 percent of farms respectively.

**Wheat, Winter:** Cleaning implements after fieldwork was reported by 45 percent of farms in the Program States. Scouting was reported by 29 percent of farms in the Program States.

**Pest Management Practices,**
**Percent of Farms Utilizing Practice,**
**Corn, 2002**

| Practice | States | | | |
|---|---|---|---|---|
| | IL | IN | IA | MN |
| | *Percent of Farms* | *Percent of Farms* | *Percent of Farms* | *Percent of Farms* |
| Prevention Practices: | | | | |
| Tillage/etc. to manage pests | 66 | 35 | 33 | 40 |
| Remove or plow down crop residue | 33 | 10 | 17 | 51 |
| Clean implements after fieldwork | 31 | 27 | 32 | 50 |
| Water management practices | 14 | 13 | 9 | 2 |
| Avoidance Practices: | | | | |
| Adjust planting/harvesting dates | 9 | 2 | 9 | 6 |
| Rotate crops to control pests | 93 | 75 | 80 | 80 |
| Alternate planting locations | 11 | 8 | 5 | 24 |
| Monitoring Practices: | | | | |
| Scouted for pests | 41 | 25 | 34 | 23 |
| Records kept to track pests | 13 | 13 | 11 | 11 |
| Field mapping of weed problems | 25 | 12 | 14 | 8 |
| Soil analysis to detect pests | 19 | 16 | 11 | 6 |
| Weather monitoring | 23 | 2 | 13 | 8 |
| Suppression Practices: | | | | |
| Scouting used to make decisions | 21 | 8 | 11 | 5 |
| Biological pesticides | 9 | 2 | 11 | 6 |
| Maintain ground cover or physical barriers | 12 | 2 | 16 | 25 |
| Adjust planting methods | 10 | 2 | 12 | 5 |
| Alternate pesticides | 56 | 28 | 47 | 44 |

**Pest Management Practices,**
**Percent of Farms Utilizing Practice,**
**Corn, 2002 (continued)**

| Practice | States | | | Program States |
|---|---|---|---|---|
| | NE | OH | WI | |
| | *Percent of Farms* | *Percent of Farms* | *Percent of Farms* | *Percent of Farms* |
| Prevention Practices: | | | | |
| Tillage/etc. to manage pests | 56 | 32 | 19 | 41 |
| Remove or plow down crop residue | 16 | 21 | 14 | 26 |
| Clean implements after fieldwork | 43 | 34 | 16 | 34 |
| Water management practices | 20 | 8 | 3 | 9 |
| Avoidance Practices: | | | | |
| Adjust planting/harvesting dates | 8 | 5 | 11 | 8 |
| Rotate crops to control pests | 69 | 90 | 58 | 78 |
| Alternate planting locations | 12 | 11 | 3 | 11 |
| Monitoring Practices: | | | | |
| Scouted for pests | 49 | 30 | 23 | 32 |
| Records kept to track pests | 29 | 11 | 8 | 13 |
| Field mapping of weed problems | 16 | 23 | 8 | 14 |
| Soil analysis to detect pests | 11 | 6 | 4 | 10 |
| Weather monitoring | 13 | 13 | 11 | 12 |
| Suppression Practices: | | | | |
| Scouting used to make decisions | 21 | 6 | 6 | 11 |
| Biological pesticides | 16 | 4 | 3 | 8 |
| Maintain ground cover or physical barriers | 25 | 16 | 3 | 15 |
| Adjust planting methods | 7 | 7 | 2 | 7 |
| Alternate pesticides | 50 | 36 | 34 | 44 |

**Pest Management Practices,**
**Percent of Acres Receiving Practice,**
**Corn, 2002**

| Practice | States | | | |
|---|---|---|---|---|
| | IL | IN | IA | MN |
| | *Percent of Acres* | *Percent of Acres* | *Percent of Acres* | *Percent of Acres* |
| Prevention Practices: | | | | |
| Tillage/etc. to manage pests | 65 | 36 | 40 | 40 |
| Remove or plow down crop residue | 30 | 11 | 20 | 44 |
| Clean implements after fieldwork | 33 | 29 | 30 | 43 |
| Water management practices | 13 | 16 | 14 | 5 |
| Avoidance Practices: | | | | |
| Biotech varieties with insect resistance only | 18 | 7 | 31 | 29 |
| Adjust planting/harvesting dates | 9 | 4 | 12 | 4 |
| Rotate crops to control pests | 91 | 75 | 79 | 85 |
| Alternate planting locations | 16 | 7 | 8 | 12 |
| Monitoring Practices: | | | | |
| Scouted for pests | 48 | 27 | 38 | 30 |
| Records kept to track pests | 15 | 15 | 13 | 17 |
| Field mapping of weed problems | 28 | 18 | 22 | 20 |
| Soil analysis to detect pests | 22 | 15 | 17 | 15 |
| Weather monitoring | 26 | 4 | 18 | 10 |
| Suppression Practices: | | | | |
| Biotech varieties with herbicide resistance only | 3 | 6 | 7 | 11 |
| Biotech varieties with stacked gene | 1 | * | 3 | 4 |
| Scouting used to make decisions | 24 | 12 | 14 | 14 |
| Biological pesticides | 10 | 2 | 12 | 10 |
| Maintain ground cover or physical barriers | 11 | 3 | 14 | 10 |
| Adjust planting methods | 11 | 4 | 14 | 8 |
| Alternate pesticides | 57 | 35 | 42 | 43 |

* Less than one percent.

**Pest Management Practices,**
**Percent of Acres Receiving Practice,**
**Corn, 2002 (continued)**

| Practice | States | | | Program States |
|---|---|---|---|---|
| | NE | OH | WI | |
| | *Percent of Acres* | *Percent of Acres* | *Percent of Acres* | *Percent of Acres* |
| Prevention Practices: | | | | |
| Tillage/etc. to manage pests | 55 | 45 | 22 | 47 |
| Remove or plow down crop residue | 20 | 25 | 12 | 25 |
| Clean implements after fieldwork | 40 | 37 | 19 | 34 |
| Water management practices | 20 | 13 | 5 | 13 |
| Avoidance Practices: | | | | |
| Biotech varieties with insect resistance only | 34 | 6 | 15 | ([1]) |
| Adjust planting/harvesting dates | 5 | 11 | 10 | 8 |
| Rotate crops to control pests | 67 | 89 | 67 | 80 |
| Alternate planting locations | 12 | 17 | 6 | 11 |
| Monitoring Practices: | | | | |
| Scouted for pests | 49 | 34 | 32 | 39 |
| Records kept to track pests | 27 | 9 | 13 | 16 |
| Field mapping of weed problems | 14 | 25 | 14 | 21 |
| Soil analysis to detect pests | 12 | 10 | 7 | 16 |
| Weather monitoring | 9 | 18 | 12 | 15 |
| Suppression Practices: | | | | |
| Biotech varieties with herbicide resistance only | 9 | 3 | 9 | ([1]) |
| Biotech varieties with stacked gene | 4 | * | 2 | ([1]) |
| Scouting used to make decisions | 23 | 8 | 9 | 17 |
| Biological pesticides | 16 | 3 | 4 | 10 |
| Maintain ground cover or physical barriers | 27 | 9 | 6 | 13 |
| Adjust planting methods | 7 | 9 | 3 | 9 |
| Alternate pesticides | 48 | 40 | 42 | 46 |

* Less than one percent.
[1] State data not available.

**Pest Management Practices,**
**Percent of Farms Utilizing Practice,**
**Durum and Other Spring Wheat, 2002**

| Practice | Durum | Other Spring | | | |
|---|---|---|---|---|---|
| | States | | | | Program States |
| | ND | MN | MT | ND | |
| | *Percent of Farms* | *Percent of Farms* | *Percent of Farms* | *Percent of Farms* | *Percent of Farms* |
| Prevention Practices: | | | | | |
| Tillage/etc. to manage pests | 23 | 46 | 11 | 48 | 29 |
| Remove or plow down crop residue | 29 | 44 | 59 | 32 | 49 |
| Clean implements after fieldwork | 55 | 55 | 73 | 74 | 67 |
| Water management practices | 2 | 6 | 1 | 10 | 5 |
| Avoidance Practices: | | | | | |
| Adjust planting/harvesting dates | 34 | 7 | 12 | 19 | 12 |
| Rotate crops to control pests | 68 | 75 | 48 | 91 | 65 |
| Alternate planting locations | 29 | 24 | 9 | 51 | 21 |
| Monitoring Practices: | | | | | |
| Scouted for pests | 71 | 48 | 59 | 57 | 55 |
| Records kept to track pests | 5 | 21 | 11 | 15 | 15 |
| Field mapping of weed problems | 14 | 18 | 15 | 26 | 18 |
| Soil analysis to detect pests | 2 | 9 | 3 | 6 | 6 |
| Weather monitoring | 14 | 21 | 7 | 35 | 17 |
| Suppression Practices: | | | | | |
| Scouting used to make decisions | 6 | 20 | 3 | 28 | 13 |
| Maintain ground cover or physical barriers | 11 | 23 | 22 | 28 | 23 |
| Adjust planting methods | 9 | 14 | 10 | 12 | 11 |
| Alternate pesticides | 41 | 49 | 70 | 57 | 60 |

**Pest Management Practices,**
**Percent of Acres Receiving Practice,**
**Durum and Other Spring Wheat, 2002**

| Practice | Durum | Other Spring | | | |
|---|---|---|---|---|---|
| | States | | | | Program States |
| | ND | MN | MT | ND | |
| | *Percent of Acres* | *Percent of Acres* | *Percent of Acres* | *Percent of Acres* | *Percent of Acres* |
| Prevention Practices: | | | | | |
| Tillage/etc. to manage pests | 29 | 52 | 26 | 63 | 45 |
| Remove or plow down crop residue | 31 | 48 | 43 | 45 | 45 |
| Clean implements after fieldwork | 67 | 53 | 67 | 67 | 64 |
| Water management practices | 3 | 10 | 3 | 14 | 8 |
| Avoidance Practices: | | | | | |
| Adjust planting/harvesting dates | 43 | 14 | 29 | 26 | 24 |
| Rotate crops to control pests | 75 | 87 | 51 | 87 | 73 |
| Alternate planting locations | 35 | 39 | 18 | 45 | 33 |
| Monitoring Practices: | | | | | |
| Scouted for pests | 68 | 61 | 52 | 72 | 61 |
| Records kept to track pests | 5 | 38 | 23 | 23 | 27 |
| Field mapping of weed problems | 21 | 24 | 23 | 21 | 23 |
| Soil analysis to detect pests | 4 | 18 | 10 | 3 | 10 |
| Weather monitoring | 21 | 37 | 8 | 48 | 29 |
| Suppression Practices: | | | | | |
| Scouting used to make decisions | 10 | 35 | 7 | 33 | 23 |
| Maintain ground cover or physical barriers | 16 | 19 | 26 | 30 | 25 |
| Adjust planting methods | 10 | 18 | 11 | 8 | 12 |
| Alternate pesticides | 48 | 54 | 47 | 65 | 55 |

**Pest Management Practices,**
**Percent of Farms Utilizing Practice,**
**Soybeans, 2002**

| Practice | States | | | | |
|---|---|---|---|---|---|
| | AR | IL | IN | IA | KS |
| | *Percent of Farms* | *Percent of Farms* | *Percent of Farms* | *Percent of Farms* | *Percent of Farms* |
| Prevention Practices: | | | | | |
| Tillage/etc. to manage pests | 27 | 50 | 23 | 32 | 33 |
| Remove or plow down crop residue | 24 | 17 | 5 | 12 | 13 |
| Clean implements after fieldwork | 29 | 22 | 17 | 23 | 38 |
| Water management practices | 3 | 2 | * | 3 | 3 |
| Avoidance Practices: | | | | | |
| Adjust planting/harvesting dates | 1 | 6 | 1 | 4 | 3 |
| Rotate crops to control pests | 19 | 87 | 67 | 83 | 73 |
| Alternate planting locations | 1 | 6 | 6 | 8 | 6 |
| Monitoring Practices: | | | | | |
| Scouted systematically for pests | 1 | 2 | 6 | 3 | * |
| Records kept to track pests | 9 | 13 | 13 | 11 | 17 |
| Field mapping of weed problems | 2 | 14 | 11 | 15 | 6 |
| Soil analysis to detect pests | 2 | 15 | 10 | 15 | 4 |
| Weather monitoring | 14 | 48 | 26 | 51 | 20 |
| Suppression Practices: | | | | | |
| Scouting used to make decisions | 7 | 16 | 12 | 15 | 11 |
| Maintain ground cover or physical barriers | 2 | 10 | 3 | 16 | 9 |
| Adjust planting methods | 6 | 25 | 9 | 31 | 15 |
| Alternate pesticides | 2 | 35 | 18 | 26 | 31 |

* Less than one percent.

**Pest Management Practices,**
**Percent of Farms Utilizing Practice,**
**Soybeans, 2002 (continued)**

| Practice | States | | | | |
|---|---|---|---|---|---|
| | KY | LA | MD | MI | MN |
| | *Percent of Farms* | *Percent of Farms* | *Percent of Farms* | *Percent of Farms* | *Percent of Farms* |
| Prevention Practices: | | | | | |
| Tillage/etc. to manage pests | 34 | 49 | 17 | 32 | 23 |
| Remove or plow down crop residue | 19 | 34 | 14 | 36 | 16 |
| Clean implements after fieldwork | 24 | 20 | 16 | 37 | 35 |
| Water management practices | 5 | 10 | * | 8 | 1 |
| Avoidance Practices: | | | | | |
| Adjust planting/harvesting dates | 5 | 7 | 9 | 2 | * |
| Rotate crops to control pests | 80 | 33 | 64 | 87 | 72 |
| Alternate planting locations | 4 | 8 | 4 | 13 | 7 |
| Monitoring Practices: | | | | | |
| Scouted systematically for pests | * | 5 | 8 | * | 2 |
| Records kept to track pests | 14 | 20 | 17 | 6 | 19 |
| Field mapping of weed problems | 10 | 9 | 18 | 14 | 15 |
| Soil analysis to detect pests | 13 | 0 | 9 | 2 | 3 |
| Weather monitoring | 31 | 80 | 41 | 43 | 45 |
| Suppression Practices: | | | | | |
| Scouting used to make decisions | 8 | 13 | 23 | 17 | 15 |
| Maintain ground cover or physical barriers | 26 | 2 | 26 | 11 | 5 |
| Adjust planting methods | 20 | 11 | 13 | 34 | 11 |
| Alternate pesticides | 27 | 15 | 10 | 30 | 25 |

* Less than one percent.

**Pest Management Practices,**
**Percent of Farms Utilizing Practice,**
**Soybeans, 2002 (continued)**

| Practice | States | | | | |
|---|---|---|---|---|---|
| | MS | MO | NE | NC | ND |
| | *Percent of Farms* | *Percent of Farms* | *Percent of Farms* | *Percent of Farms* | *Percent of Farms* |
| Prevention Practices: | | | | | |
| Tillage/etc. to manage pests | 58 | 39 | 31 | 32 | 33 |
| Remove or plow down crop residue | 27 | 16 | 14 | 51 | 35 |
| Clean implements after fieldwork | 46 | 13 | 20 | 44 | 50 |
| Water management practices | 20 | * | 10 | 7 | 2 |
| Avoidance Practices: | | | | | |
| Adjust planting/harvesting dates | 6 | 4 | 1 | 5 | 1 |
| Rotate crops to control pests | 18 | 69 | 93 | 67 | 83 |
| Alternate planting locations | 5 | 3 | 10 | 8 | 21 |
| Monitoring Practices: | | | | | |
| Scouted systematically for pests | 3 | * | 2 | 1 | * |
| Records kept to track pests | 3 | 7 | 24 | 7 | 16 |
| Field mapping of weed problems | 3 | 4 | 18 | 19 | 23 |
| Soil analysis to detect pests | * | 5 | 1 | 9 | * |
| Weather monitoring | 44 | 40 | 57 | 59 | 61 |
| Suppression Practices: | | | | | |
| Scouting used to make decisions | 5 | 2 | 19 | 12 | 25 |
| Maintain ground cover or physical barriers | 14 | 15 | 35 | 15 | 13 |
| Adjust planting methods | 7 | 14 | 18 | 18 | 18 |
| Alternate pesticides | 4 | 20 | 33 | 20 | 48 |

* Less than one percent.

**Pest Management Practices,**
**Percent of Farms Utilizing Practice,**
**Soybeans, 2002 (continued)**

| Practice | States | | | | | Program States |
|---|---|---|---|---|---|---|
| | OH | SD | TN | VA | WI | |
| | *Percent of Farms* | *Percent of Farms* | *Percent of Farms* | *Percent of Farms* | *Percent of Farms* | *Percent of Farms* |
| Prevention Practices: | | | | | | |
| Tillage/etc. to manage pests | 30 | 19 | 19 | 25 | 14 | 31 |
| Remove or plow down crop residue | 16 | 8 | 11 | 13 | 11 | 18 |
| Clean implements after fieldwork | 25 | 27 | 12 | 33 | 11 | 26 |
| Water management practices | 4 | * | 1 | * | * | 3 |
| Avoidance Practices: | | | | | | |
| Adjust planting/harvesting dates | 2 | 6 | 13 | 6 | 4 | 4 |
| Rotate crops to control pests | 70 | 83 | 60 | 47 | 74 | 72 |
| Alternate planting locations | 3 | 11 | 9 | 10 | 14 | 7 |
| Monitoring Practices: | | | | | | |
| Scouted systematically for pests | 1 | 3 | 7 | 8 | 2 | 2 |
| Records kept to track pests | 5 | 26 | 16 | 15 | 9 | 12 |
| Field mapping of weed problems | 8 | 16 | 10 | 11 | 11 | 12 |
| Soil analysis to detect pests | 3 | 8 | 3 | 10 | * | 8 |
| Weather monitoring | 34 | 54 | 48 | 58 | 29 | 42 |
| Suppression Practices: | | | | | | |
| Scouting used to make decisions | 8 | 25 | 16 | 16 | 18 | 13 |
| Maintain ground cover or physical barriers | 7 | 18 | 14 | 30 | 12 | 12 |
| Adjust planting methods | 18 | 5 | 31 | 5 | 30 | 19 |
| Alternate pesticides | 14 | 10 | 21 | 16 | 28 | 23 |

* Less than one percent.

**Pest Management Practices,**
**Percent of Acres Receiving Practice,**
**Soybeans, 2002**

| Practice | States | | | | |
|---|---|---|---|---|---|
| | AR | IL | IN | IA | KS |
| | *Percent of Acres* | *Percent of Acres* | *Percent of Acres* | *Percent of Acres* | *Percent of Acres* |
| Prevention Practices: | | | | | |
| Tillage/etc. to manage pests | 51 | 52 | 26 | 39 | 39 |
| Remove or plow down crop residue | 40 | 20 | 7 | 16 | 20 |
| Clean implements after fieldwork | 50 | 22 | 15 | 28 | 43 |
| Water management practices | 7 | 3 | * | 2 | 5 |
| Avoidance Practices: | | | | | |
| Adjust planting/harvesting dates | 4 | 4 | 1 | 4 | 5 |
| Rotate crops to control pests | 37 | 88 | 70 | 85 | 61 |
| Alternate planting locations | 2 | 8 | 3 | 6 | 4 |
| Monitoring Practices: | | | | | |
| Scouted systematically for pests | 4 | 2 | 3 | 2 | * |
| Records kept to track pests | 17 | 16 | 10 | 11 | 20 |
| Field mapping of weed problems | 4 | 16 | 17 | 17 | 8 |
| Soil analysis to detect pests | 4 | 16 | 18 | 21 | 3 |
| Weather monitoring | 23 | 53 | 34 | 45 | 22 |
| Suppression Practices: | | | | | |
| Biotech varieties with herbicide resistance only | 68 | 71 | 83 | 75 | 83 |
| Scouting used to make decisions | 12 | 18 | 11 | 18 | 12 |
| Maintain ground cover or physical barriers | 2 | 12 | 3 | 18 | 6 |
| Adjust planting methods | 12 | 30 | 12 | 20 | 19 |
| Alternate pesticides | 5 | 36 | 16 | 22 | 26 |

* Less than one percent.

**Pest Management Practices,**
**Percent of Acres Receiving Practice,**
**Soybeans, 2002 (continued)**

| Practice | States | | | | |
|---|---|---|---|---|---|
| | KY | LA | MD | MI | MN |
| | *Percent of Acres* | *Percent of Acres* | *Percent of Acres* | *Percent of Acres* | *Percent of Acres* |
| Prevention Practices: | | | | | |
| Tillage/etc. to manage pests | 31 | 42 | 31 | 40 | 23 |
| Remove or plow down crop residue | 7 | 25 | 15 | 41 | 14 |
| Clean implements after fieldwork | 16 | 12 | 27 | 40 | 33 |
| Water management practices | 4 | 4 | * | 15 | 2 |
| Avoidance Practices: | | | | | |
| Adjust planting/harvesting dates | 4 | 6 | 6 | 1 | * |
| Rotate crops to control pests | 81 | 30 | 70 | 92 | 73 |
| Alternate planting locations | 3 | 4 | 4 | 10 | 4 |
| Monitoring Practices: | | | | | |
| Scouted systematically for pests | * | 4 | 3 | * | 5 |
| Records kept to track pests | 9 | 16 | 20 | 7 | 29 |
| Field mapping of weed problems | 12 | 12 | 25 | 16 | 17 |
| Soil analysis to detect pests | 5 | * | 10 | 2 | 3 |
| Weather monitoring | 29 | 78 | 46 | 48 | 42 |
| Suppression Practices: | | | | | |
| Biotech varieties with herbicide resistance only | 72 | 71 | 80 | 72 | 71 |
| Scouting used to make decisions | 4 | 7 | 31 | 15 | 16 |
| Maintain ground cover or physical barriers | 18 | 2 | 31 | 11 | 4 |
| Adjust planting methods | 16 | 12 | 12 | 36 | 12 |
| Alternate pesticides | 20 | 10 | 10 | 36 | 19 |

* Less than one percent.

**Pest Management Practices,**
**Percent of Acres Receiving Practice,**
**Soybeans, 2002 (continued)**

| Practice | States | | | | |
|---|---|---|---|---|---|
| | MS | MO | NE | NC | ND |
| | *Percent of Acres* | *Percent of Acres* | *Percent of Acres* | *Percent of Acres* | *Percent of Acres* |
| Prevention Practices: | | | | | |
| Tillage/etc. to manage pests | 66 | 45 | 37 | 34 | 27 |
| Remove or plow down crop residue | 31 | 14 | 13 | 37 | 40 |
| Clean implements after fieldwork | 56 | 14 | 21 | 55 | 55 |
| Water management practices | 25 | * | 12 | 2 | 1 |
| Avoidance Practices: | | | | | |
| Adjust planting/harvesting dates | 6 | 6 | 1 | 6 | 1 |
| Rotate crops to control pests | 24 | 66 | 90 | 60 | 83 |
| Alternate planting locations | 6 | 2 | 11 | 5 | 15 |
| Monitoring Practices: | | | | | |
| Scouted systematically for pests | 4 | * | 1 | * | * |
| Records kept to track pests | 3 | 7 | 28 | 9 | 17 |
| Field mapping of weed problems | 3 | 5 | 22 | 15 | 25 |
| Soil analysis to detect pests | 2 | 4 | 1 | 10 | * |
| Weather monitoring | 42 | 37 | 55 | 57 | 68 |
| Suppression Practices: | | | | | |
| Biotech varieties with herbicide resistance only | 80 | 72 | 85 | 78 | 61 |
| Scouting used to make decisions | 8 | 5 | 27 | 17 | 20 |
| Maintain ground cover or physical barriers | 19 | 18 | 34 | 25 | 10 |
| Adjust planting methods | 6 | 11 | 18 | 18 | 21 |
| Alternate pesticides | 4 | 15 | 37 | 21 | 50 |

* Less than one percent.

**Pest Management Practices,**
**Percent of Acres Receiving Practice,**
**Soybeans, 2002 (continued)**

| Practice | States | | | | | Program States |
|---|---|---|---|---|---|---|
| | OH | SD | TN | VA | WI | |
| | *Percent of Acres* | *Percent of Acres* | *Percent of Acres* | *Percent of Acres* | *Percent of Acres* | *Percent of Acres* |
| Prevention Practices: | | | | | | |
| Tillage/etc. to manage pests | 32 | 27 | 18 | 18 | 24 | 37 |
| Remove or plow down crop residue | 8 | 3 | 9 | 8 | 15 | 17 |
| Clean implements after fieldwork | 33 | 31 | 12 | 27 | 10 | 29 |
| Water management practices | 2 | * | 1 | 1 | * | 3 |
| Avoidance Practices: | | | | | | |
| Adjust planting/harvesting dates | 2 | 9 | 10 | 6 | 4 | 4 |
| Rotate crops to control pests | 71 | 78 | 54 | 57 | 82 | 74 |
| Alternate planting locations | 2 | 11 | 8 | 14 | 10 | 6 |
| Monitoring Practices: | | | | | | |
| Scouted systematically for pests | 1 | 6 | 5 | 9 | 2 | 2 |
| Records kept to track pests | 4 | 37 | 23 | 17 | 13 | 16 |
| Field mapping of weed problems | 15 | 22 | 17 | 15 | 14 | 15 |
| Soil analysis to detect pests | 8 | 7 | 7 | 12 | 0 | 10 |
| Weather monitoring | 42 | 57 | 48 | 68 | 33 | 45 |
| Suppression Practices: | | | | | | |
| Biotech varieties with herbicide resistance only [1] | 73 | 89 | ([1]) | ([1]) | 78 | ([1]) |
| Scouting used to make decisions | 11 | 38 | 21 | 21 | 29 | 17 |
| Maintain ground cover or physical barriers | 3 | 15 | 16 | 33 | 14 | 12 |
| Adjust planting methods | 15 | 6 | 24 | 5 | 46 | 18 |
| Alternate pesticides | 11 | 8 | 24 | 13 | 21 | 22 |

* Less than one percent.
[1] State data not available.

**Pest Management Practices,**
**Percent of Farms Utilizing Practice,**
**Winter Wheat, 2002**

| Practice | States | | | | |
|---|---|---|---|---|---|
| | CO | IL | KS | MO | MT |
| | *Percent of Farms* | *Percent of Farms* | *Percent of Farms* | *Percent of Farms* | *Percent of Farms* |
| Prevention Practices: | | | | | |
| Tillage/etc. to manage pests | 66 | 51 | 35 | 41 | 26 |
| Remove or plow down crop residue | 49 | 20 | 28 | 22 | 45 |
| Clean implements after fieldwork | 51 | 30 | 50 | 43 | 70 |
| Water management practices | 8 | 5 | 3 | 1 | 5 |
| Avoidance Practices: | | | | | |
| Adjust planting/harvesting dates | 9 | 53 | 30 | 32 | 44 |
| Rotate crops to control pests | 59 | 74 | 55 | 53 | 70 |
| Alternate planting locations | 6 | 20 | 9 | 22 | 29 |
| Monitoring Practices: | | | | | |
| Scouted for pests | 40 | 61 | 22 | 2 | 65 |
| Records kept to track pests | 7 | 11 | 7 | 2 | 26 |
| Field mapping of weed problems | 9 | 4 | 6 | 2 | 29 |
| Soil analysis to detect pests | 15 | 5 | 2 | 1 | 11 |
| Weather monitoring | 6 | 12 | 4 | 2 | 17 |
| Suppression Practices: | | | | | |
| Scouting used to make decisions | 12 | 9 | 7 | 2 | 21 |
| Maintain ground cover or physical barriers | 30 | 4 | 11 | 7 | 20 |
| Adjust planting methods | 11 | 6 | 5 | 2 | 32 |
| Alternate pesticides | 7 | 9 | 15 | 30 | 60 |

**Pest Management Practices,**
**Percent of Farms Utilizing Practice,**
**Winter Wheat, 2002 (continued)**

| Practice | States | | | | | Program States |
|---|---|---|---|---|---|---|
| | NE | OH | OK | TX | WA | |
| | *Percent of Farms* | *Percent of Farms* | *Percent of Farms* | *Percent of Farms* | *Percent of Farms* | *Percent of Farms* |
| Prevention Practices: | | | | | | |
| Tillage/etc. to manage pests | 24 | 39 | 29 | 42 | 51 | 37 |
| Remove or plow down crop residue | 22 | 6 | 30 | 29 | 36 | 26 |
| Clean implements after fieldwork | 51 | 27 | 38 | 43 | 73 | 45 |
| Water management practices | 3 | * | 10 | 4 | 10 | 4 |
| Avoidance Practices: | | | | | | |
| Adjust planting/harvesting dates | 18 | 51 | 7 | 6 | 48 | 29 |
| Rotate crops to control pests | 63 | 77 | 17 | 30 | 66 | 54 |
| Alternate planting locations | 22 | 11 | 5 | 12 | 27 | 13 |
| Monitoring Practices: | | | | | | |
| Scouted for pests | 19 | 16 | 35 | 36 | 70 | 29 |
| Records kept to track pests | 9 | 5 | 5 | 7 | 38 | 9 |
| Field mapping of weed problems | 13 | 16 | 9 | 4 | 35 | 10 |
| Soil analysis to detect pests | 10 | 3 | 14 | 4 | 4 | 5 |
| Weather monitoring | 10 | 4 | 10 | 8 | 38 | 8 |
| Suppression Practices: | | | | | | |
| Scouting used to make decisions | 6 | 5 | 9 | 2 | 26 | 8 |
| Maintain ground cover or physical barriers | 27 | 17 | 10 | 11 | 20 | 13 |
| Adjust planting methods | 10 | 11 | 5 | 1 | 22 | 8 |
| Alternate pesticides | 22 | 27 | 17 | 15 | 64 | 21 |

* Less than one percent.

**Pest Management Practices,**
**Percent of Acres Receiving Practice,**
**Winter Wheat, 2002**

| Practice | States | | | | |
|---|---|---|---|---|---|
| | CO | IL | KS | MO | MT |
| | *Percent of Acres* | *Percent of Acres* | *Percent of Acres* | *Percent of Acres* | *Percent of Acres* |
| Prevention Practices: | | | | | |
| Tillage/etc. to manage pests | 52 | 50 | 38 | 52 | 25 |
| Remove or plow down crop residue | 39 | 23 | 23 | 32 | 41 |
| Clean implements after fieldwork | 43 | 38 | 52 | 40 | 69 |
| Water management practices | 7 | 7 | 4 | 2 | 3 |
| Avoidance Practices: | | | | | |
| Adjust planting/harvesting dates | 11 | 58 | 32 | 28 | 41 |
| Rotate crops to control pests | 59 | 78 | 52 | 52 | 66 |
| Alternate planting locations | 7 | 15 | 7 | 14 | 29 |
| Monitoring Practices: | | | | | |
| Scouted for pests | 37 | 55 | 24 | 3 | 61 |
| Records kept to track pests | 11 | 15 | 7 | 3 | 31 |
| Field mapping of weed problems | 13 | 8 | 6 | 3 | 32 |
| Soil analysis to detect pests | 15 | 5 | 3 | 2 | 8 |
| Weather monitoring | 7 | 16 | 6 | 2 | 17 |
| Suppression Practices: | | | | | |
| Scouting used to make decisions | 17 | 14 | 7 | 3 | 19 |
| Maintain ground cover or physical barriers | 24 | 4 | 9 | 11 | 25 |
| Adjust planting methods | 13 | 12 | 6 | 6 | 29 |
| Alternate pesticides | 9 | 11 | 16 | 22 | 63 |

**Pest Management Practices,**
**Percent of Acres Receiving Practice,**
**Winter Wheat, 2002 (continued)**

| Practice | States | | | | | Program States |
|---|---|---|---|---|---|---|
| | NE | OH | OK | TX | WA | |
| | *Percent of Acres* | *Percent of Acres* | *Percent of Acres* | *Percent of Acres* | *Percent of Acres* | *Percent of Acres* |
| Prevention Practices: | | | | | | |
| Tillage/etc. to manage pests | 31 | 42 | 34 | 49 | 43 | 40 |
| Remove or plow down crop residue | 30 | 11 | 31 | 44 | 33 | 30 |
| Clean implements after fieldwork | 62 | 31 | 47 | 54 | 76 | 53 |
| Water management practices | 4 | 1 | 8 | 7 | 6 | 5 |
| Avoidance Practices: | | | | | | |
| Adjust planting/harvesting dates | 27 | 49 | 10 | 11 | 39 | 27 |
| Rotate crops to control pests | 60 | 87 | 26 | 36 | 63 | 51 |
| Alternate planting locations | 12 | 11 | 8 | 12 | 23 | 12 |
| Monitoring Practices: | | | | | | |
| Scouted for pests | 35 | 21 | 38 | 34 | 67 | 35 |
| Records kept to track pests | 22 | 4 | 6 | 9 | 32 | 12 |
| Field mapping of weed problems | 17 | 15 | 11 | 4 | 31 | 12 |
| Soil analysis to detect pests | 11 | 7 | 12 | 5 | 7 | 7 |
| Weather monitoring | 8 | 6 | 13 | 12 | 35 | 12 |
| Suppression Practices: | | | | | | |
| Scouting used to make decisions | 8 | 4 | 13 | 7 | 24 | 11 |
| Maintain ground cover or physical barriers | 25 | 15 | 11 | 14 | 22 | 14 |
| Adjust planting methods | 12 | 6 | 7 | 4 | 20 | 9 |
| Alternate pesticides | 20 | 28 | 16 | 17 | 60 | 23 |

## Survey, Estimation Procedures, and Reliability

**Survey Procedures:** Data for corn, soybeans, and wheat were collected during the months of August through December of 2002. Data for soybeans were obtained from the 2002 Agricultural Resources Management Survey (ARMS). Large screening samples were drawn from the NASS List Sampling Frame. This extensive sampling frame covers all types of farms and accounts for approximately 82% of all land in farms in the U.S. The screening samples were selected in such a way as to insure that all farms on the list had a possibility of being selected. Farms that were more likely to be producers of soybeans were more likely to be in the screening sample. The sampled farms were screened to determine if they grew soybeans in 2002. From this subpopulation of operations identified as producing soybeans, a subsample of farms was selected in such a way as to insure that each identified producer had an opportunity to be selected. In general, larger farms were more likely to be selected than smaller farms. Once a farm producing soybeans was selected, one soybean field was randomly selected from all the soybean fields on the farm. The operator of the sampled field was personally interviewed to obtain information on chemical applications made to the selected field.

Data for corn, durum, other spring, and winter wheat were obtained from the Field Crop Chemical Use Survey (FCCUS). The samples for FCCUS were drawn via the Objective Yield Survey (OYS). The OYS samples were drawn from the NASS Area Sampling Frame. The Area Sampling frame covers the entire continental US, thus accounting for 100% of all land in farms in the targeted states. Large screening samples were drawn, and acreage was screened to determine the presence of the crops of interest. From this subpopulation, individual acres of the targeted commodity were sampled for OYS. In FCCUS, data were collected for the field that contained the OYS sampled acre(s). A large field was more likely to be selected than a small field. FCCUS data for the field were only collected once, even if a field contained multiple OYS samples. If an operation had multiple fields selected, then only one field was used. The operator of the sampled field was personally interviewed to obtain information on chemical applications made to the selected field.

**Field Crops Chemical Use Estimation Procedures:** The chemical application data, reported by product name or trade name, are reviewed within each State and across States for reasonableness and consistency. This review compares reported data with manufacturer's recommendations and with data from other farm operators using the same product. Following this review, product information is converted to an active ingredient level. The chemical usage estimates in this publication consist of survey estimates of those active ingredients.

Estimates of the total amount of active ingredient applied are based on the acreage estimates published in the annual NASS report "**Crop Production - 2002 Summary**" [Cr Pr 2-1(03)] for corn, soybean, durum, other spring, and winter wheat.

The estimates for total amount applied will not be revised even if there are subsequent revisions to acreage for a given crop.

Detailed data within a table may not multiply across or add down due to independent rounding of the published values.

**Field Crops Chemical Usage Reliability:** The surveys were designed so that the estimates are statistically representative of chemical use on the targeted crops in the surveyed states. The reliability of these survey results is affected by sampling variability and non- sampling errors. The results of this survey are subject to sampling variability. Sampling variability is a measure of how the estimates would differ if other samples had been drawn. The sampling variability expressed as a percent of the estimate is called the coefficient of variation (cv). Sampling variability of the estimates differed considerably by chemical and crop. Variability for estimates of acres treated will be higher than the variability for estimates of application rates. This is because application rates have a narrower range of responses, are recommended by the manufacturer of the product, and are generally followed. In general, the more often the chemical was applied, the smaller the sampling variability. For example, estimates of use of a commonly used product, such as atrazine, will exhibit less variability than a more rarely used product. For more commonly used chemicals, cv's will range from 5-35 percent at the U.S. level and 5-75 percent at the state or regional level. Some rarer items could have cv's above 100 percent. These items have insufficient data for publication and these instances are noted with an asterisk (*). Non-sampling errors occur during a survey process, and unlike sampling variability, are difficult to measure. They may be caused by interviewers failing to follow instructions, poorly worded questions, non-response, problematic survey procedures, or data handling mistakes between collection and publication. In these surveys, all survey procedures and analyses were carried out in a consistent and orderly manner to minimize the occurrence of these types of errors.

## Terms and Definitions

**Active ingredient:** Refers to the mechanism of action in pesticides which kills or controls the target pests. Usage data are reported by pesticide product and are converted to an amount of active ingredient. A single method of conversion has been chosen for active ingredients having more than one way of being converted. For example in this report, copper compounds are expressed in their metallic copper equivalent, and others such as 2,4-D and glyphosate are expressed in their acid equivalent.

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

**Application Rates:** Refer to the average number of pounds of a fertilizer primary nutrient or pesticide active ingredient applied to an acre of land. Rate per application is the average number of pounds applied per acre in one application. Rate per crop year is the average number of pounds applied per acre counting multiple applications. Number of applications is the average number of times a treated acre received a specific primary nutrient or active ingredient.

**Area applied:** Represents the percentage of crop acres receiving one or more applications of a specific primary nutrient or active ingredient. This report does not contain acre treatments. However, acre treatments can be calculated by multiplying the acres planted (harvested for winter wheat) by the percent of area applied and the average number of applications.

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

The following pest management questions were categorized as avoidance practices:

Did you adjust planting or harvesting dates to control pests?

Did you rotate crops for the purpose of controlling pests?

Did you choose planting locations to avoid cross infestation of insects or disease?

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

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

**Common name:** An officially recognized name for an active ingredient. This report shows active ingredient by common name.

**Crop year:** Refers to the period immediately following harvest of the previous crop through harvest of the current crop.

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

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

**Fertilizer**: Refers to applications of the primary nutrients; nitrogen, phosphate, and potash.

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

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

**Monitoring:** Includes proper identification of pests through systematic sampling or counting or other forms of scouting. Also, weather monitoring to predict levels of pest populations or to determine the most effective time to make pesticide applications, and soil testing where appropriate.

The following pest management practices questions were categorized as monitoring practices:

Was this crop scouted for pests (weeds, insects or disease) using a systematic method?

Was this field scouted for pest by performing systematic sampling or counting? (soybeans)

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

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

Did you use soil analysis to detect the presence of soilborne pests or pathogens?

Did you use weather monitoring to predict the need for pesticide applications?

Did you use weather data to help determine when to make pesticide applications? (soybeans)

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

**Pesticides:** As defined by the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), pesticides include any substance or mixture of substances intended for preventing, destroying, repelling or mitigating any pest, and any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant. The four classes of pesticides presented in this report and the pests targeted are: herbicides - weeds, insecticides - insects, fungicides - fungi, and other chemicals - other forms of life. Miticides and nematicides are included as insecticides while soil fumigants, growth regulators, defoliants, and desiccants are included as other chemicals.

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

**Prevention:** Is the practice of keeping a pest population from infesting a crop or field. It includes such tactics as using pest-free seeds or transplants, alternative tillage approaches such as no-till or strip-till systems, choosing cultivars with genetic resistance to insects or disease, irrigation scheduling to avoid situations conducive to disease development, cleaning tillage and harvesting equipment between fields or operations, using field sanitation procedures, and eliminating alternate hosts or sites for insect pests and disease organisms.

The following pest management questions were categorized as prevention practices:

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

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

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

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

**Suppression:** Tactics include cultural practices such as narrow row spacings or optimized in-row plant populations, using cover crops or mulches, or using crops with allelopathic potential in the rotation. Physical suppression tactics may include cultivation or mowing for weed control, baited or pheromone traps for certain insects, and temperature management or exclusion devices for insect and disease management. Biological pesticides and controls, including mating disruption for insects, can be considered as alternatives to conventional pesticides. Determining pest thresholds and alternating pesticide active ingredients to avoid resistance buildup are suppression methods which minimize pesticide use.

The following questions were categorized as suppression practices:

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

Did you use topically applied biological pesticides such as Bt (Bacillus thuringiensis), insect growth regulators, neem or other natural products to control pests?

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

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

Did you alternate pesticides to keep pests from becoming resistant to pesticides (use pesticides with different mechanisms of action)?

**Trade name:** A trademark name given to a specific formulation of a pesticide product. A formulation contains a specific concentration of the active ingredient, carrier materials, and other ingredients such as emulsifiers and wetting agents.

## Trade Names, Common Names, and Classes

The following is a list showing common name, associated class, and trade name of active ingredients in this publication. The classes are herbicides (H), insecticides (I), fungicides (F), and other chemicals (O). This list is provided as an aid in reviewing pesticide data. Pre-mixes are not cataloged. The list is not complete for all pesticides used on corn, soybeans, durum, other spring, and winter wheat and NASS does not mean to imply use of any specific trade name.

| Class | Common Name | Trade Name |
|---|---|---|
| H | 2,4-D | Agsco, Amine, Banvel + 2,4-D, Barrage, Class, Clean Crop, Curtail, Dacamine, Defy, Envy, Formula, Hi-Dep, Landmaster, Lithate, Riverside, RT Master, Salvo, Savage, Shotgun, Starane + Saber, Turret, Weed Rhap, Weedar, Weedone |
| H | 2,4-D, Dimeth. salt | Range Star |
| H | 2,4-DB, Dimeth. salt | Butoxone, Butyrac |
| H | 2,4-DP, Dimeth. salt | Amine |
| I | Acephate | Orthene |
| H | Acetamide | Axiom, Define, Domain, Epi |
| H | Acetic acid | Esteron, LV 400 2,4-D Weed Killer, Starane + Salvo |
| H | Acetochlor | Degree Xtra, DoublePlay, Field Master, Fultime, Harness, Surpass, TopNotch |
| H | Acifluorfen | Blazer, Conclude, Scepter, Storm |
| H | Alachlor | Bronco, Bullet, Lariat, Lasso, Micro-Tech, Partner |
| I | Aldicarb | Temik |
| H | Atrazine | Aatre, Banvel-K + Atrazine, Basis Gold, Bicep, Buctril + Atrazine, Bullet, Degree, Extrazine, Field Master, Fultime, Guardsman, Harness, Laddok, Lariat, LeadOff, Liberty, Marksman, Moxy + Atrazine, Ready Master, Shotgun, Simazat, Surpass |
| F | Azoxystrobin | Quadris (Abound) |
| H | Bentazon | Basagran, Conclude, Laddok, Rezult, Storm |
| I | Benzoic acid | Intrepid |
| I | Bifenthrin | Capture |
| H | Bromoxynil | Bromox/MCPA, Bronate, Buctril, Moxy + Atrazine |
| H | Bromoxynil octanoate | Bronate |
| I | Bt | Condor |
| H | Butoxy. ester 2,4-D | 2,4-D/Weedone LV6 |
| I | Carbaryl | Sevin |
| I | Carbofuran | Furadan |
| H | Carfentrazone-ethyl | AIM |
| I | Chlorethoxyfos | Fortress |
| H | Chlorimuron-ethyl | Authority, Canopy, Classic, Reliance, Synchrony |
| I | Chlorpyrifos | Chlorpyrifos, Lorsban |
| H | Chlorsulfuron | Finesse, Glean |

--- continued

| Class | Common Name | Trade Name |
|---|---|---|
| H | Clethodim | Conclude, Select |
| H | Clodinafop-propargil | Discover |
| H | Clomazone | Command |
| H | Clopyralid | Accent, Curtail, Hornet |
| H | Cloransulam-methyl | Amplify, FirstRate, Frontrow, Gauntlet |
| H | Colleto. gloeospor | Collego (fungal spores) |
| H | Cyanazine | Bladex, Cy-Pro, Extrazine |
| I | Cyfluthrin | Aztec |
| I | Cypermethrin | Ammo |
| H | Dicamba | Banvel, Celebrity, Clarity, Fallow Master, NorthStar, Rave, Weedmaster |
| H | Dicamba, Dimet. salt | Distinct, Range Star, Sterlin |
| H | Dicamba, Pot. salt | Banvel-K + Atrazine, Marksman |
| H | Dicamba, Sodium salt | Celebrity, Yukon |
| H | Dichlorprop | Weedone |
| H | Diclofop-methyl | Hoelon |
| I | Dicrotophos | Bidrin |
| H | Difenzoquat | Avenge |
| I | Diflubenzuron | Dimilin |
| H | Diflufenzopyr-sodium | Celebrity, Distinct |
| H | Dimethenamid | Detail, Frontier, Guardsman, LeadOff |
| H | Dimethenamid-P | Guardsman, Outlook |
| I | Dimethoate | Cygon, Digon |
| I | Disulfoton | Di-Syston |
| H | EPTC | DoublePlay |
| I | Esfenvalerate | Asana |
| H | Ethalfluralin | Sonalan |
| I | Ethoprop | Mocap |
| H | Fenoxaprop | Bugle, Cheyenne, Fusion, Puma |
| I | Fipronil | Regent, Regent |
| H | Fluazifop-P-butyl | Fusilade, Fusion, Typhoon |
| H | Flucarbazone-sodium | Everest |
| H | Flumetsulam | Accent Gold, Bicep, Broadstrike + Dual, Broadstrike + Treflan, Frontrow, Hornet, Python |
| H | Flumiclorac-pentyl | Resource |
| H | Flumioxazin | Valor |
| H | Fluroxypyr | Starane, Starane + Saber |
| H | Fluroxypyr 1-methyl | Starane + Sword, Starane + Salvo |
| H | Fomesafen | Flexstar, Reflex, Typhoon |
| I | Fonofos | Dyfonate |
| H | Foramsulfuron | Option |

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| Class | Common Name | Trade Name |
|---|---|---|
| H | Glufosinate-ammonium | Liberty |
| H | Glyphosate | Accord, Backdraft, Buccaneer, Clear-Out, Gly Star, Cornerstone, Extreme, Fallow Master, Field Master, Glyfos, Glyphomax, Honcho, Landmaster, Mirage, RT Master, Rattler, Ready Master, Roundup |
| H | Glyphosate diam. salt | Touchdown |
| H | Halosulfuron | Permit, Yukon |
| I | Helicoverpa zea NPV | Gemstar |
| H | Imazamethabenz | Assert |
| H | Imazamox | Raptor |
| H | Imazapyr | Lightning |
| H | Imazaquin | Backdraft, Detail, Scepter, Squadron, Steel |
| H | Imazaquin, sod. salt | Scepter |
| H | Imazethapyr | Extreme, Lightning, Pursuit, Steel |
| I | Imidacloprid | Gaucho |
| I | Indoxacarb | Steward |
| H | Isoxaflutole | Balance, Epi |
| H | Lactofen | Cobra, Phoenix |
| I | Lambda-cyhalothrin | Karate, Warrior |
| H | Linuron | Lorox |
| H | MCPA | Agsco, Bromox, Bronate, Cheyenne, Class, Curtail, MCP Ester, MCP Amine, Rhomene, Rhonox, Starane + Sword, Sword, Weedone MCPA Ester |
| I | Malathion | Malathion |
| F | Mancozeb | Dithane |
| H | Mesotrione | Callisto |
| I | Methomyl | Lannate |
| I | Methyl parathion | Declare, Penncap-M |
| H | Metolachlor | Bicep, Broadstrike + Dual, Dual, Turbo |
| H | Metribuzin | Axiom, Boundary, Canopy, Domain, Lexone, Sencor, Turbo |
| H | Metsulfuron-methyl | Ally, Canvas, Finesse |
| H | Nicosulfuron | Accent, Basis, Celebrity, DPX-79406, Steadfast |
| H | Oxyfluorfen | Goal |
| H | Paraquat | Gramoxone, Gramoxone/Cyclone |
| H | Pendimethalin | Prowl, Pursuit, Squadron, Steel |
| I | Permethrin | Ambush, Pounce |
| I | Phorate | Thimet |
| H | Picloram | Tordon |
| H | Primisulfuron | Beacon, Exceed, NorthStar, Spirit |

--- continued

| Class | Common Name | Trade Name |
|---|---|---|
| F | Propiconazole | Stratego, Tilt |
| H | Prosulfuron | Exceed, Peak, Spirit |
| H | Pyridate | Tough/Lentagran, Tough |
| H | Quizalofop-P-ethyl | Assure |
| H | Quizalofop-ethyl | Assure |
| H | Rimsulfuron | Accent, Basis, DPX-79406, Steadfast |
| H | S-Metolachlor | Bicep, Boundary, Dual |
| H | Sethoxydim | Conclude B&G, Poast, Rezult, Ultima |
| H | Simazine | Caliber, Princep, Simazat, Simazine |
| O | Sodium chlorate | Sodium Chlorate |
| I | Spinosad | Success |
| H | Sulfentrazone | Authority, Canopy, Command, Gauntlet, Spartan |
| H | Sulfosate | Touchdown |
| H | Sulfosulfuron | Maverick |
| F | Sulfur | Sulfur |
| F | Tebuconazole | Folicur |
| I | Tebupirimphos | Aztec |
| I | Tefluthrin | Force |
| I | Terbufos | Counter |
| H | Thifensulfuron | Ally, Basis, Canvas, Harmony, Pinnacle, Reliance, Synchrony, Cheyenne |
| I | Thiodicarb | Larvin |
| F | Thiophanate-methyl | Tilt, Topsin |
| H | Tralkoxydim | Achieve |
| I | Tralomethrin | Scout |
| H | Triallate | Buckle, Far-Go |
| H | Triasulfuron | Amber, Rave |
| H | Tribenuron-methyl | Ally Extra, Canvas, Express, Harmony, Cheyenne |
| F | Trifloxystrobin | Stratego |
| H | Trifluralin | Broadstrike + Treflan, Buckle, Treflan, Tri-4, Trifluralin, Trilin, Trust |
| H | Vernolate | Vernam |
| I | Zeta-cypermethrin | Fury, Mustang |

| COMPLETION CODE for FERTILIZER and NUTRIENT EDIT TABLE | | |
|---|---|---|
| 1<br>3 | Incomplete/Refusal<br>Valid Zero | 200 |

1. Were any commercial FERTILIZERS (*nitrogen, phosphate, and potash*) applied to the selected field for the 2002 corn crop?
[*Read the items to be included from the list below before accepting a "NO" answer.*] . . . . . YES=1

CODE 201

| INCLUDE | EXCLUDE |
|---|---|
| ☐ Custom applied fertilizers | ☐ Micro-nutrients (*e.g., iron, zinc, boron*) |
| ☐ Fertilizer applied in the fall of 2001 and earlier, if this field was fallow in 2001 | ☐ Lime and gypsum |
| ☐ Commercially prepared manure | ☐ Unprocessed manure |
| ☐ Applications made by airplane | ☐ Fertilizer applied to previous crops in this field |
| ☐ Nitrogen applied with herbicides for "burn down" | |

[*If NO fertilizers applied, go to Section* B.]

| | T-TYPE | TABLE |
|---|---|---|
| | 2 | 001 |
| LINE 99 | OFFICE USE LINES IN TABLE | 213 |

2. Record each fertilizer application on the selected field on a separate line in the table below.

| LINE | 1 MATERIALS USED [*Enter percentage analysis or pounds of actual plant nutrients applied per acre.*] [*Show Common Fertilizers in Respondent Booklet.*] N Nitrogen | $P_2O_5$ Phosphate | $K_2O$ Potash | 2 What quantity was applied per acre? [*Leave this column blank if actual nutrients were reported.*] | 3 UNIT CODE 1 Pounds 12 Gallons 19 Pounds of actual nutrients | 4 How many acres were treated in this application? ACRES |
|---|---|---|---|---|---|---|
| 01 | 205 | 206 | 207 | 208 | 209 | 212 .___ |
| 02 | 205 | 206 | 207 | 208 | 209 | 212 .___ |
| 03 | 205 | 206 | 207 | 208 | 209 | 212 .___ |
| 04 | 205 | 206 | 207 | 208 | 209 | 212 .___ |
| 05 | 205 | 206 | 207 | 208 | 209 | 212 .___ |
| 06 | 205 | 206 | 207 | 208 | 209 | 212 .___ |
| 07 | 205 | 206 | 207 | 208 | 209 | 212 .___ |
| 08 | 205 | 206 | 207 | 208 | 209 | 212 .___ |

| T-TYPE | TABLE | LINE |
|---|---|---|
| 0 | 000 | 00 |

| COMPLETION CODE for PESTICIDE EDIT TABLE | | |
|---|---|---|
| 1<br>3 | Incomplete/Refusal<br>Valid Zero | 300 |

1. Were any PESTICIDES (*herbicides, insecticides, fungicides or other chemicals*) applied to the selected field for the 2002 corn crop?

[*Read the items to be included from the list below before accepting a "NO" answer.*] . . . . . YES=1

| CODE |
|---|
| 301 |

| INCLUDE | EXCLUDE |
|---|---|
| Custom applied pesticides | Fertilizers reported earlier in Section A |
| Pesticides applied in the fall of 2001 and earlier, if this field was fallow in 2001 | Seed treatments |
| Defoliants or desiccants | Spot treatments (*with no discernable acreage*) |
| Biological and botanical pesticides | Adjuvants (*e.g., wetting agents, stickers, spreaders*) |
| Applications made by airplane | Fertilizers applied as foliar sprays |
| Partial field treatments | Applications to fence rows, ditch banks, etc. |

[*If NO pesticides applied, go to Section* C.]

| | T-TYPE | TABLE |
|---|---|---|
| | 3 | 001 |
| LINE 99 | OFFICE USE LINES IN TABLE | 319 |

2. Record all pesticide applications on the selected field in the table below.

| NOTES | LINE | 1 What products were applied to this field? [*Show product codes from Respondent Booklet.*] | 2 Was this product bought in liquid or dry form? [*Enter L or D.*] | 3 Was this part of a tank mix? [*If tank mix, enter line number of first product in mix.*] |
|---|---|---|---|---|
| | 01 | 305 | | 306 |
| | 02 | 305 | | 306 |
| | 03 | 305 | | 306 |
| | 04 | 305 | | 306 |
| | 05 | 305 | | 306 |
| | 06 | 305 | | 306 |
| | 07 | 305 | | 306 |
| | 08 | 305 | | 306 |
| | 09 | 305 | | 306 |
| | 10 | 305 | | 306 |
| | 11 | 305 | | 306 |
| | 12 | 305 | | 306 |
| | 13 | 305 | | 306 |
| | 14 | 305 | | 306 |

3. [*For pesticides not listed in Respondent Booklet, specify* --]

| LINE | Pesticide Type (*Herbicide, Insecticide Fungicide, etc.*) | EPA No. or Tradename and Formulation | Form Purchased (Liquid or Dry) | Where Purchased [*Ask only if EPA No. can't be reported.*] |
|---|---|---|---|---|

CODES for Column 6

1 Pounds
12 Gallons
13 Quarts
14 Pints
15 Ounces, fluid
28 Ounces, dry
30 Grams

| LINE | 4 **How much was applied per acre per application?** | **OR** 5 **What was the total amount applied per application in this field?** | 6 [*Enter unit code from above.*] | 7 How many acres in this field were treated with this product? ACRES | 8 How many times was it applied? **NUMBER** |
|---|---|---|---|---|---|
| 01 | 308 • ___ ___ | 309 • ___ ___ | 310 | 312 •___ | 313 |
| 02 | 308 • ___ ___ | 309 • ___ ___ | 310 | 312 •___ | 313 |
| 03 | 308 • ___ ___ | 309 • ___ ___ | 310 | 312 •___ | 313 |
| 04 | 308 • ___ ___ | 309 • ___ ___ | 310 | 312 •___ | 313 |
| 05 | 308 • ___ ___ | 309 • ___ ___ | 310 | 312 •___ | 313 |
| 06 | 308 • ___ ___ | 309 • ___ ___ | 310 | 312 •___ | 313 |
| 07 | 308 • ___ ___ | 309 • ___ ___ | 310 | 312 •___ | 313 |
| 08 | 308 • ___ ___ | 309 • ___ ___ | 310 | 312 •___ | 313 |
| 09 | 308 • ___ ___ | 309 • ___ ___ | 310 | 312 •___ | 313 |
| 10 | 308 • ___ ___ | 309 • ___ ___ | 310 | 312 •___ | 313 |
| 11 | 308 • ___ ___ | 309 • ___ ___ | 310 | 312 •___ | 313 |
| 12 | 308 • ___ ___ | 309 • ___ ___ | 310 | 312 •___ | 313 |
| 13 | 308 • ___ ___ | 309 • ___ ___ | 310 | 312 •___ | 313 |
| 14 | 308 • ___ ___ | 309 • ___ ___ | 310 | 312 •___ | 313 |

| T-TYPE | TABLE | LINE |
|---|---|---|
| **0** | **000** | **00** |

Now I have some questions about pest management practices used on the selected field for the 2002 corn crop. By pests, we mean weeds, insects and diseases.

| | | CODE |
|---|---|---|
| 1. | Was this crop scouted for pests (*weeds, insects or disease*) using a systematic method? . . . . . **YES = 1** | 446 |
| 2. | Were electronic or written records kept to track the activity or numbers of different pests? . . . . . **YES = 1** | 447 |
| 3. | Did you use scouting data and compare it to university or extension guidelines for infestation thresholds to determine when to take measures to control pests? . . . . . **YES = 1** | 448 |
| 4. | Did you use field mapping of previous weed problems to assist you in making weed management decisions? . . . . . **YES = 1** | 449 |
| 5. | Did you use soil analysis to detect the presence of soilborne pests or pathogens? . . . . . **YES = 1** | 450 |
| 6. | Did you use topically applied biological pesticides such as Bt (*Bacillus Thuringiensis*), insect growth regulators, neem or other natural products to control pests? . . . . . **YES = 1** | 452 |
| 7. | Did you use water management practices, such as controlled drainage or irrigation scheduling, excluding chemigation, to control pests? . . . . . **YES = 1** | 458 |
| 8. | Did you remove or plow down crop residues to control pests? . . . . . **YES = 1** | 456 |
| 9. | Did you use practices such as tilling, mowing, burning, or chopping of field edges, lanes, ditches, roadways or fence lines to manage pests? . . . . . **YES = 1** | 455 |
| 10. | Did you clean tillage or harvesting implements after completing field work for the purpose of reducing the spread of weeds, diseases or other pests? . . . . . **YES = 1** | 457 |

| | | CODE |
|---|---|---|
| 11. | Did you adjust planting or harvesting dates to control pests? . . . . . **YES = 1** | 460 |
| 12. | Did you choose planting locations to avoid cross infestation of insects or disease? . . . . . **YES = 1** | 464 |
| 13. | Did you rotate crops for the purpose of controlling pests? . . . . . **YES = 1** | 462 |
| 14. | Did you use weather monitoring to predict the need for pesticide application? . . . . **YES = 1** | 480 |
| 15. | Did you alternate pesticides to keep pests from becoming resistant to pesticides (*use pesticides with different mechanisms of action*)? . . . . . **YES = 1** | 461 |
| 16. | Did you adjust row spacing, plant density or row direction to control pests? . . . . . **YES = 1** | 459 |
| 17. | Did you maintain ground covers, mulches or physical barriers to reduce pest problems? . . . . . **YES = 1** | 454 |

[Enumerator Note: *Code when all cells in this section are blank.*] . . . . . .

| **COMPLETION CODE for PEST MANAGEMENT EDIT** | | |
|---|---|---|
| 1 | Incomplete/Refusal | 442 |

# Index

**-2-**



**-A-**



**-B-**



**-C-**

**-C (cont)-**



**-D-**



**-E-**



**-F-**

**-F (cont)-**



**-G-**



**-H-**



**-I-**



**-L-**



**-M-**

**-N-**



**-O-**



**-P-**



**-Q-**



**-R-**



**-S-**

**-S (cont)-**



**-T-**



**-V-**



**-Z-**

## Report Features

Released May 14, 2003 by the National Agricultural Statistics Service (NASS), Agricultural Statistics Board, U.S. Department of Agriculture. For information on "Agricultural Chemical Usage" call Chris Cadwallader (202) 720-6146, office hours 7:30 a.m. to 4:00 p.m. ET.

The next "Agricultural Chemical Usage" report will be released July 16, 2003. This report will cover agricultural chemical use for the 2002 crop year for vegetables in selected states.

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

| | |
|---|---|
| Chris Cadwallader, Environmental Statistician | (202) 690-0392 |
| Kevin Hintzman, Head, Environmental and Demographics Section | (202) 720-0684 |
| Linda Hutton, Chief, Environmental, Economics, and Demographics Branch | (202) 694-5620 |

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