2020 AGRICULTURAL CHEMICAL USE SURVEY

Soybeans

Nineteen states . . .

. . . accounted for 96.32% of U.S. acres planted to soybeans in 2020.

About the Survey

The Agricultural Chemical Use Program of USDA's National Agricultural Statistics Service (NASS) is the federal government's official source of statistics about on-farm and post-harvest commercial fertilizer and pesticide use and pest management practices. NASS conducts field crop agricultural chemical use surveys in cooperation with USDA's Economic Research Service as part of the Agricultural Resource Management Survey. NASS conducted the soybean chemical use survey in the fall of 2020.

Access the Data

Access 2020 soybean chemical use data as well as results from prior (or earlier) soybean chemical use surveys in the Quick Stats database (https://quickstats.nass.usda.gov/).

- In Program, select "Survey"
- In Sector, select "Environmental"
- In Group, select "Field Crops"
- In Commodity, select "Soybeans"
- Select your category, data item, geographic level, and year

For pre-defined Quick Stats queries, go to http://bit.ly/AgChem and click "Data Tables" under the 2020 Corn, Peanut, and Soybean heading. For methodology information, click "Methodology."

The 2020 Agricultural Chemical Use Survey of soybean producers collected data about fertilizer and pesticide use as well as pest management practices for soybean production. NASS conducted the survey in 19 states that accounted for 96.32% of the 83.08 million acres planted to soybeans in the United States in 2020: Arkansas, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Michigan, Minnesota, Mississippi, Missouri, Nebraska, North Carolina, North Dakota, Ohio, South Dakota, Tennessee, Virginia, and Wisconsin. (Fig. 1)

Soybean planted acreage totals are for the 2020 crop year, the one-year period beginning after the 2019 harvest and ending with the 2020 harvest. (Table 4)

Fig. 1. States in the 2020 Soybean Chemical Use Survey
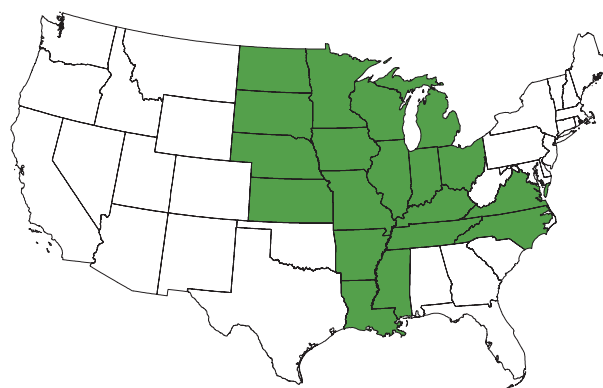
Fertilizer Use

Fertilizer refers to a soil-enriching input that contains one or more plant nutrients. Nitrogen, phosphate, potash, and sulfur were the most widely used fertilizer materials on soybeans. For the 2020 crop year, farmers applied potash to 44% of planted acres, at an average rate of 89 pounds per ace, for a total of 3,150.5 million pounds. Farmers applied phosphate to 42% of planted acres and nitrogen to 32% of planted acres. (Table 1)

Table 1. Fertilizer Applied to Soybean Planted Acres, 2020 Crop Year

	% of Acres with Nutrient[a]	Average Rate (lbs/acre)	Total Applied (mil lbs)
Potash (K_2O)	44	89	3,150.5
Phosphate (P_2O_5)	42	55	1,878.3
Nitrogen (N)	32	17	449.9
Sulfur (S)	13	13	137.8

[a]Acres with multiple nutrients are counted in each category.

Pesticide Use

The pesticide active ingredients used on soybeans are classified in this report as herbicides (targeting weeds), insecticides (targeting insects), fungicides (targeting fungal disease), and other chemicals (targeting all other pests and other materials, including extraneous crop foliage). Herbicides were used most extensively, applied to 98% of planted acres. Fungicides were applied to 22% of planted acres, insecticides to 20%. (Fig. 2)

Among herbicides, glyphosate potassium salt was the most widely used active ingredient (applied to 40% of planted acres), followed by glyphosate isopropylamine salt (38%) (Table 2). These were also the most widely applied herbicides in the 2018 survey of soybean producers.

Fig. 2. Pesticides Applied to Soybean Planted Acres, 2020 Crop Year
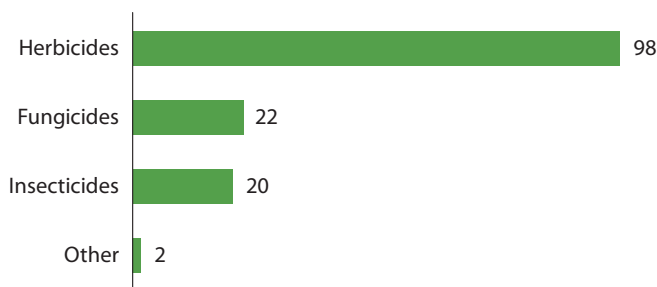(% of planted acres)

Table 2. Top Herbicides Applied to Soybean Planted Acres, 2020 Crop Year

Active Ingredient	% of Acres with Ingredient[a]	Average Rate (lbs/acre)	Total Applied (mil lbs)
Glyphosate potassium salt	40	1.556[b]	50.2[b]
Glyphosate isopropylamine salt	38	1.079[b]	32.6[b]
Sulfentrazone	21	0.20	3.4
S-Metolachlor	19	1.307	20.1
Dicamba, diglycolamine salt	18	0.560[b]	8.3[b]

[a]Acres with multiple ingredients are counted in each category.
[b]Expressed in acid equivalent.

Pest Management Practices

The survey asked growers to report on the practices they used to manage pests, defined as weeds, insects, or diseases. Soybean growers reported practices in four categories: prevention, avoidance, monitoring, and suppression.

- *Prevention* practices involve actions to keep a pest population from infesting a crop or field.
- *Avoidance* practices use cultural measures to mitigate or eliminate the detrimental effects of pests.
- *Monitoring* practices involve observing or detecting pests through systematic sampling, counting, or other forms of scouting.
- *Suppression* practices involve controlling or reducing existing pest populations to mitigate crop damage.

Table 3 shows the top practice in each category. For example, the most widely used prevention practice in growing soybeans in 2020 was no till or minimum till.

Table 3. Top Practice in Pest Management Category, 2020
(% of soybean planted acres)

Prevention: No till or minimum till	69
Avoidance: Rotated crops during last three years	87
Monitoring: Scouting for weeds (deliberately, or by general observations while performing tasks)	94
Suppression: Used pesticides with different mechanisms of action to keep pests from becoming resistant to pesticides	53

Table 4. U.S. and Surveyed States: Acres of Soybeans Planted, 2020

	Millions of Acres	% of U.S.
U.S. Total	83.08	100
Illinois	10.30	12.40
Iowa	9.40	11.31
Minnesota	7.40	8.91
Missouri	5.85	7.04
North Dakota	5.75	6.92
Indiana	5.70	6.86
Nebraska	5.20	6.26
South Dakota	4.95	5.96
Ohio	4.90	5.90
Kansas	4.75	5.72
Arkansas	2.82	3.39
Michigan	2.20	2.65
Mississippi	2.09	2.52
Wisconsin	2.00	2.41
Kentucky	1.85	2.23
Tennessee	1.65	1.99
North Carolina	1.60	1.93
Louisiana	1.05	1.26
Virginia	0.57	0.69
Total, Surveyed States	**80.03**	**96.32**