United States Department of Agriculture
National Agricultural Statistics Service

Minnesota Ag News – Chemical Use
Soybeans: Fall 2023

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Cooperating with the Minnesota Department of Agriculture

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The National Agricultural Statistics Service (NASS) Agricultural Chemical Use Program is the U.S. Department of Agriculture's official source of statistics about on-farm and post-harvest fertilizer and pesticide use and pest management practices.

In the fall of 2023, NASS collected data for the 2023 crop year, the one-year period beginning after the 2022 harvest and ending with the 2023 harvest, about chemical use and pest management practices used on soybean production. The data was collected as part of the Agricultural Resource Management Survey (ARMS) and the results are presented here.

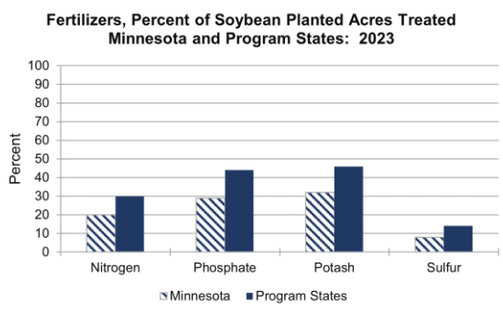
Fertilizer Use: Of the three primary macronutrients, potash was the most widely used on soybean acres planted in Minnesota. Farmers applied potash to 32 percent of planted acres at an average rate of 65 pounds per acre per year. Macronutrients nitrogen and phosphate were applied at an average rate of 38 and 50 pounds per acre per year, respectively. The secondary macronutrient, sulfur, was applied to 8 percent of acres planted to soybeans.

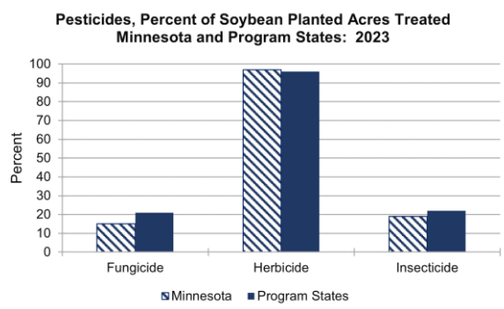
Pesticide Use: Herbicide active ingredients were applied to 97 percent of the soybean acres planted. 2, 4-D, choline salt was the most widely used pesticide on soybean acres, and was also the active ingredient with the greatest total amount applied. Fungicides and insecticides were applied to 15 and 19 percent of soybean acres planted in Minnesota, respectively.

Pesticide Use on Soybeans – Minnesota and Program States: 2023

Active ingredient	Minnesota			Program states [1]		
	Planted acres treated	Yearly rate	Total applied	Planted acres treated	Yearly rate	Total applied
	(percent)	(lbs per acre)	(1,000 lbs)	(percent)	(lbs per acre)	(1,000 lbs)
Fungicide						
Azoxystrobin	4	0.103	30	6	0.100	454
Fluxapyroxad	8	0.043	25	4	0.064	188
Propiconazole	5	0.108	38	8	0.108	669
Pyraclostrobin	8	0.087	51	4	0.111	391
Tetraconazole	7	0.059	29	2	0.074	95
Total [2]	15		216	21		3,678
Herbicide [3]						
2, 4-D, choline salt	64	0.644	3,006	37	0.713	21,406
Clethodim	20	0.121	181	16	0.161	2,029
Cloransulam-methyl	21	0.024	38	6	0.021	92
Glufosinate-ammonium	28	0.560	1,158	23	0.526	9,703
Glyphosate dim. salt	46	0.531	1,787	25	0.559	11,056
Glyphosate iso. salt	38	0.778	2,155	46	1.106	41,158
Glyphosate pot. salt	13	1.251	1,197	22	1.407	24,723
S-Metolachlor	15	1.262	1,352	20	1.320	20,909
Sulfentrazone	39	0.212	604	19	0.209	3,130
Total [2]	97		13,648	96		196,352
Insecticide						
Bifenthrin	7	0.071	37	7	0.061	342
Lambda-cyhalothrin	9	0.029	20	10	0.028	226
Thiamethoxam	6	0.050	21	3	0.042	108
Total [2]	19		91	22		1,987

(D) Withheld to avoid disclosing data for individual operations.
[1] The 19 program states surveyed about soybeans in the 2023 ARMS were Arkansas, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Michigan, Minnesota, Mississippi, Missouri, Nebraska, North Carolina, North Dakota, Ohio, South Dakota, Tennessee, Virginia, and Wisconsin.
[2] Total Fungicide, Herbicide, and Insecticide include pesticides not listed in the table.
[3] Given the large number of herbicides applied to row crops, active ingredients applied to less than 10 percent of planted acres in Iowa are not included in this table but can be found at www.nass.usda.gov.





Fertilizer Use on Soybeans – Minnesota and Program States: 2023

Active ingredient	Minnesota			Program states [1]		
	Planted acres treated	Yearly rate	Total applied	Planted acres treated	Yearly rate	Total applied
	(percent)	(lbs per acre)	(1,000 lbs)	(percent)	(lbs per acre)	(1,000 lbs)
Nitrogen	20	38	56,500	30	22	537,000
Phosphate	29	50	105,700	44	57	2,041,600
Potash	32	65	154,000	46	88	3,287,000
Sulfur	8	16	9,800	14	20	230,800

[1] The 19 program states surveyed about soybeans in the 2023 ARMS were Arkansas, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Michigan, Minnesota, Mississippi, Missouri, Nebraska, North Carolina, North Dakota, Ohio, South Dakota, Tennessee, Virginia, and Wisconsin.

Crop rotation was the top pest management practice on Soybean acreage in Minnesota.

Pest Management Practices on Soybeans – Minnesota and Program States: 2023

	Minnesota		Program states	
	% of area planted	% of operations	% of area planted	% of operations
Avoidance				
Crop or plant variety chosen for specific pest resistance	64	65	54	55
Planting locations planned to avoid cross infestation of pests	13	12	14	13
Planting or harvesting dates adjusted	10	10	13	15
Rotated crops during past 3 years	88	87	81	78
Row spacing, plant density, or row directions adjusted	15	14	19	19
Monitoring				
Diagnostic laboratory services used for pest detection via soil or plant tissue analysis	6	4	7	6
Field mapping data used to assist decisions	14	12	13	11
Scouted -				
established process used	28	23	17	14
for pests due to a pest advisory warning	17	13	11	10
for pests due to a pest development model	21	17	9	7
for pests or beneficial organisms-not scouted	1	1	8	10
for pests or beneficial organism by conducting general observations while performing routine tasks	21	25	30	31
for pests or beneficial organism by deliberately going to the crop acres or growing areas	78	74	62	59
Weather data used to assist decisions	64	63	61	59
Written or electronic records kept to track pest activity	55	50	40	34
Prevention				
Beneficial insect or vertebrate habitat maintained	6	6	8	6
Crop residues removed or burned down	1	1	12	15
Equipment and implements cleaned after field work to reduce spread of pests	44	44	42	39
Field edges, ditches, or fence lines chopped, sprayed, mowed, plowed, or burned	56	54	51	48
Field left fallow previous year to manage insects	0	0	1	1
Flamer used to kill weeds	(Z)	(Z)	1	1
No-till or minimum-till used	40	37	62	61
Plowed down crop residue using conventional tillage	21	27	17	19
Seed treated for insect or disease control after purchase	37	39	32	28
Water management practices used	2	1	3	2
Suppression				
Beneficial organisms applied or released	3	2	1	1
Biological pesticides applied	2	1	3	3
Buffer strips or border rows maintained to isolate organic from non-organic crops	5	6	5	5
Floral lures, attractants, repellants, pheromone traps, or biological pest controls used	0	0	(Z)	(Z)
Ground covers, mulches, or other physical barriers maintained	31	27	37	34
Pesticides with different mechanisms of action to keep pest from becoming resistant to pesticides	29	28	40	38
Scouting data compared to published information to assist decisions	36	33	22	18
Trap crop grown to manage insects	1	(Z)	1	(Z)

(Z) Less than half of the unit shown.
[1] The 19 program states surveyed about Soybeans in the 2023 ARMS were Arkansas, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Michigan, Minnesota, Mississippi, Missouri, Nebraska, North Carolina, North Dakota, Ohio, South Dakota, Tennessee, Virginia, and Wisconsin.

More information and data for the USDA NASS Chemical Use Program can be found at:
https://www.nass.usda.gov/Surveys/Guide_to_NASS_Surveys/Chemical_Use/.