



## 2022 AGRICULTURAL CHEMICAL USE

# Vegetable Crops

### 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 agricultural chemical use surveys as part of the Agricultural Resource Management Survey. NASS conducted the Vegetable Chemical Use Survey in fall 2022.

### Access the Data

Access 2022 and earlier vegetable chemical use data through the Quick Stats database ([quickstats.nass.usda.gov](https://quickstats.nass.usda.gov)).

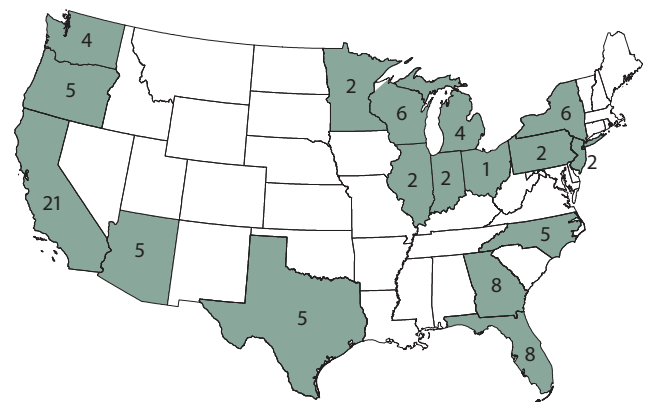
- In Program, select "Survey"
- In Sector, select "Environmental"
- In Group, select "Vegetables"
- In Commodity, select the vegetable(s) for which you want data
- Select your category, data item, geographic level, and year

For pre-defined Quick Stats queries that take you to data for a particular vegetable, go to [bit.ly/AgChem](https://bit.ly/AgChem) and click "Data Tables" under the 2022 Vegetables heading. For survey methodology information, click "Methodology."

The 2022 Agricultural Chemical Use Survey of vegetable producers collected data about fertilizer and pesticide use as well as pest management practices on acres planted to 22 different vegetable crops. NASS conducted the survey among producers in 17 states, focusing on the states that were major producers for the surveyed crops. (Fig. 1)

Data are for the 2022 crop year, the one-year period beginning after the 2021 harvest and ending with the 2022 harvest. Detailed data are available online for all 22 vegetable crops (see sidebar for how to access). This document highlights three vegetables: snap beans, squash, and sweet corn.

**Fig. 1. States in the 2022 Vegetable Chemical Use Survey**  
(number of crops surveyed in state)



### Fertilizer Use

Fertilizer refers to a soil-enriching input that contains one or more plant nutrients, primarily nitrogen (N), phosphate (P<sub>2</sub>O<sub>5</sub>), and potash (K<sub>2</sub>O). For the 2022 crop year, nitrogen was the most widely applied nutrient for all three featured vegetable crops, measured as percent of planted acres (Table 1). Potash was the second most commonly applied nutrient.

**Table 1. Nitrogen Applied to Planted Acres, Selected Vegetables, 2022 Crop Year**

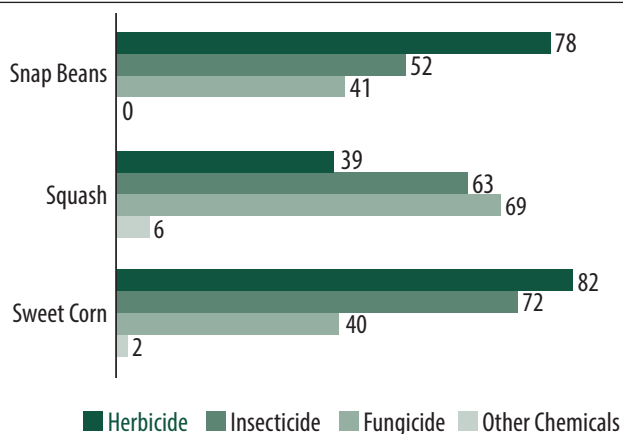
	% of Acres w Nitrogen Applied	Average Rate (lbs/acre)	Total Applied (mil lbs)
Snap Beans	71	71	7.4
Squash	78	54	1.6
Sweet Corn	92	101	32.5

## Pesticide Use

The pesticide active ingredients used on vegetables are classified 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).

Snap bean growers applied herbicides to more acres (78% of planted acres) than insecticides or fungicides (52% and 41% of planted acres, respectively). Squash growers applied fungicides and insecticides to 69% and 63% of planted acres, respectively. Sweet corn growers applied herbicides to 82% of planted acres but insecticides and fungicides to fewer acres. (Fig. 2) Further detail on the top pesticides can be found in Table 2.

**Fig. 2. Pesticides Applied to Selected Vegetables, 2022 Crop Year**  
(percent of planted acres)



## Pest Management Practices

The survey asked growers to report on the practices they used to manage pests, including weeds, insects, and diseases. Vegetable growers reported practices in four categories of pest management strategy, widely referred to as PAMS – 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 by systematic sampling, counting, or other forms of scouting.
- *Suppression* practices involve controlling or reducing existing pest populations to mitigate crop damage.

The most widely used prevention practice for selected vegetables was cleaning equipment and implements after field work, used on 77% of planted acres. The top avoidance practice was rotating crops (82%). Scouting for diseases was the most widely reported monitoring practice, used on 98% of vegetable planted acres. The suppression practice of using

pesticides with different mechanisms of action to keep pests from becoming resistant to pesticides was used on 57% of the acres. (Table 3)

**Table 2. Top Pesticides Applied to Selected Vegetables, 2022 Crop Year**  
(percent of planted acres, 22 vegetables)

Active Ingredient	% of Acres with Ingredient Applied	Average Rate (lbs/acre)	Total Applied (lbs)
<b>Herbicides</b>			
<b>Snap Beans</b>			
Bentazon	47	0.647	49,600
S- Metolachlor	35	1.378	76,600
<b>Squash</b>			
Clomazone	20	0.205	1,600
Ethalfualin	20	0.776	6,100
Fomesafen sodium	6	0.195	500
<b>Sweet Corn</b>			
Atrazine	60	0.527	110,500
Tembotrione	30	0.085	8,800
<b>Insecticides</b>			
<b>Snap Beans</b>			
Lambda-cyhalothrin	26	0.039	1,600
Bifenthrin	19	0.320	9,400
<b>Squash</b>			
Chlorantraniliprole	23	0.184	1,600
Imidacloprid	12	0.247	1,100
<b>Sweet Corn</b>			
Bifenthrin	31	0.112	13,400
Lambda-cyhalothrin	30	0.062	6,500
<b>Fungicides</b>			
<b>Snap Beans</b>			
Thiophanate-methyl	20	2.698	83,600
Azoxystrobin	11	0.356	6,200
<b>Squash</b>			
Chlorothalonil	53	4.778	98,900
Copper hydroxide	36	2.426	33,600
<b>Sweet Corn</b>			
Propiconazole	23	0.099	8,000
Pyraclostrobin	19	0.179	12,100

**Table 3. Top Practice in Pest Management Category, 2022 Crop Year**  
(percent of planted acres, 22 vegetables)

<i>Prevention</i> : Equipment and implements cleaned after field work	77
<i>Avoidance</i> : Rotated crops during past three years	82
<i>Monitoring</i> : Scouted for diseases (deliberately, or by general observations while performing other tasks)	98
<i>Suppression</i> : Used pesticides with different mechanisms of action to keep pests from becoming resistant to pesticides	57