



2014 AGRICULTURAL CHEMICAL USE SURVEY

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 2014.

Access the Data

Access vegetable chemical use data through the Quick Stats 2.0 database (<http://quickstats.nass.usda.gov>).

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

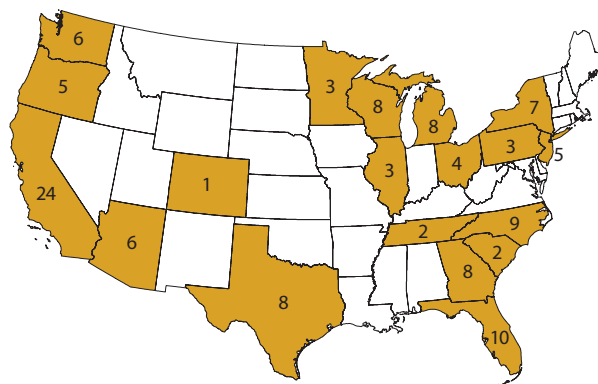
For pre-defined Quick Stats queries that take you to data for a particular vegetable, go to <http://bit.ly/AgChem> and click "Data Tables" under the 2014 Vegetables heading. For survey methodology information, click "Methodology."

The 2014 Agricultural Chemical Use Survey collected data about fertilizer and pesticide use as well as pest management practices on acres planted to 29 different vegetable crops. NASS conducted the survey among producers in 19 states, focusing on the states that were major producers for the surveyed crops. (Fig. 1) In most cases, the combination of states surveyed represented a significant percentage of the acres of that crop planted in 2014 (see matrix on p. 4).

Data are for the 2014 crop year, the one-year period beginning after the 2013 harvest and ending after the 2014 harvest. Data are available online for all 29 vegetables (see sidebar for how to access). This document highlights five selected vegetables:

fresh-market (FM) sweet corn, FM cucumbers, onions, snap beans grown for processing, and watermelons.

Fig. 1. States in the 2014 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. NASS collected data on three widely applied nutrients: nitrogen (N), phosphate (P_2O_5), and potash (K_2O).

For the 2014 crop year, nitrogen was the most widely applied nutrient for all five featured crops, measured as percent of planted acres. For watermelons, potash was equally widely applied (94 percent). Nitrogen was followed by phosphate in the case of fresh-market sweet corn and onions, and by potash in the case of cucumbers. (Table 1)

Table 1. Fertilizers Applied to Selected Vegetables, by percent of planted acres, 2014 Crop Year

	% of Planted Acres	Avg. Rate for Year (lbs/acre)	Total Applied (mil lbs)
Corn, sweet (FM)			
Nitrogen	98	190	34.1
Phosphate	87	83	13.2
Potash	85	175	26.9
Cucumbers (FM)			
Nitrogen	97	130	4.7
Phosphate	94	44	1.6
Potash	96	125	4.5
Onions			
Nitrogen	98	211	24.2
Phosphate	91	122	12.8
Potash	68	134	10.0
Snap beans (PR)			
Nitrogen	88	94	10.5
Phosphate	84	91	9.6
Potash	84	50	5.2
Watermelons			
Nitrogen	94	133	10.8
Phosphate	85	80	5.9
Potash	94	146	12.0

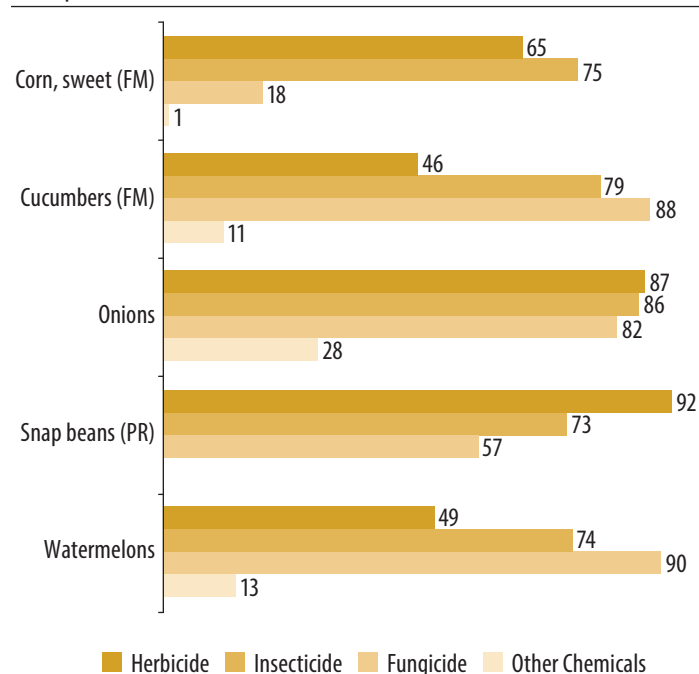
FM = fresh market. PR = processing.

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).

Sweet corn growers applied insecticides to more acres (75 percent of planted acres) than herbicides or fungicides (65 and 18 percent of planted acres respectively). Snap bean (PR) growers applied herbicides to 92 percent of planted acres and other pesticides to fewer acres. Watermelon growers, on the other hand, applied fungicides to 90 percent of planted acres but insecticides and herbicides to fewer acres. Onion growers applied the various kinds of pesticides more equally. (Fig. 2)

Fig. 2. Pesticides Applied to Selected Vegetables, 2014 Crop Year (% of planted acres)



Tables 2 through 4 show the top two herbicides, insecticides, and fungicides applied to each featured vegetable.

Table 2. Top Herbicides, by percent of planted acres, Selected Vegetables, 2014 Crop Year

	% of Planted Acres	Avg. Rate for Year (lbs/acre)	Total Applied (lbs)
Corn, sweet (FM)			
Atrazine	46	1.254	106,400
S-Metolachlor	30	1.556	87,600
Cucumbers (FM)			
Clomazone	27	0.192	1,900
Ethalfuralin	26	0.579	5,800
Onions			
Oxyfluorfen	68	0.36	27,500
Pendimethalin	61	1.645	111,400
Snap beans (PR)			
S-Metolachlor	44	0.955	52,600
EPTC	40	3.271	163,600
Watermelons			
Trifluralin	11	0.773	7,400
Glyphosate	11	1.041	10,100

FM = fresh market. PR = processing.

Table 3. Top Insecticides, by percent of planted acres, Selected Vegetables, 2014 Crop Year

	% of Planted Acres	Avg. Rate for Year (lbs/acre)	Total Applied (lbs)
Corn, sweet (FM)			
Lambda-cyhalothrin	45	0.132	11,100
Methomyl	32	2.073	122,000
Cucumbers (FM)			
Methomyl	29	0.354	3,900
Zeta-cypermethrin	23	0.117	1,000
Onions			
Methomyl	44	1.828	91,100
Spirotetramat	40	0.132	5,900
Snap beans (PR)			
Bifenthrin	62	0.124	9,600
Lambda-cyhalothrin	13	0.045	700
Watermelons			
Flubendiamide	18	0.075	1,200
Chlorantraniliprole	18	0.070	1,100

FM = fresh market. PR = processing.

Table 4. Top Fungicides, by percent of planted acres, Selected Vegetables, 2014 Crop Year

	% of Planted Acres	Avg. Rate for Year (lbs/acre)	Total Applied (lbs)
Corn, sweet (FM)			
Propiconazole	9	0.219	3,700
Mancozeb	7	3.547	48,400
Cucumbers (FM)			
Chlorothalonil	60	2.773	63,700
Fluopicolide	50	0.124	2,300
Onions			
Mancozeb	57	3.402	217,200
Chlorothalonil	46	3.403	174,500
Snap beans (PR)			
Thiophanate-methyl	39	1.398	68,800
Copper hydroxide	25	0.598	18,600
Watermelons			
Chlorothalonil	60	5.378	285,100
Mancozeb	56	5.307	261,600

FM = fresh market. PR = processing.

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 through systematic sampling, counting, or other forms of scouting.
- *Suppression* practices involve controlling or reducing existing pest populations to mitigate crop damage.

Scouting for insects and mites was the most widely reported monitoring practice, used on 99 percent of vegetable planted acres. The most widely used avoidance practice was crop rotation, used on 81 percent of planted acres.

The prevention practice of chopping, spraying, mowing, plowing, or burning field edges, ditches, and fence lines was used on 80 percent of planted acres, and the suppression practice of applying various pesticides to keep pests from becoming resistant was used on 70 percent of acres. (Table 5)

Table 5. Top Practice in Pest Management Category, 2014 Crop Year
(% of planted acres, 29 vegetables)

Prevention: Chopped, sprayed, mowed, plowed, or burned field edges, ditches or fence lines	80
Avoidance: Rotated crops during last three years	81
Monitoring: Scouted for insects and mites (deliberately, or by general observations while performing other tasks)	99
Suppression: Used pesticides with different mechanisms of action to keep pests from becoming resistant to pesticides	70

States and Crops in the 2014 Vegetable Chemical Use Survey

	Arizona	California	Colorado	Florida	Georgia	Illinois	Michigan	Minnesota	New Jersey	New York	North Carolina	Ohio	Oregon	Pennsylvania	South Carolina	Tennessee	Texas	Washington	Wisconsin	Surveyed States		
																				No.	% of U.S. acres of crop	
Asparagus		X					X											X			3	100
Beans, snap (FM)		X		X	X					X	X					X					6	89
Beans, snap (PR)						X	X			X			X	X						X	6	65
Broccoli		X																			1	95
Cabbage (FM)		X		X	X					X	X						X		X		7	80
Cantaloupes	X	X															X				3	86
Carrots (FM)		X					X										X				3	89
Carrots (PR)																		X	X		2	32
Cauliflower		X																			1	89
Celery		X																			1	94
Corn, sweet (FM)		X	X	X	X	X	X		X	X	X	X	X	X			X		X		14	80
Corn, sweet (PR)								X										X	X		3	79
Cucumbers (FM)		X		X	X		X		X	X	X										7	88
Cucumbers (PR)				X			X				X	X			X		X		X		7	74
Garlic		X																			1	97
Honeydews	X	X																			2	95
Lettuce, Head	X	X																			2	100
Lettuce, Other	X	X																			2	100
Onions		X			X					X							X	X	X		7	71
Peas, green (PR)								X					X					X	X		4	85
Peppers, bell		X		X	X				X		X										5	91
Pumpkins		X				X	X					X		X							5	89
Spinach (FM)	X	X															X				3	95
Squash		X		X	X		X		X	X	X										7	83
Strawberries		X		X									X					X			4	91
Tomatoes (FM)		X		X					X		X	X				X					6	83
Tomatoes (PR)		X																			1	94
Watermelons	X	X		X	X						X				X		X				7	76
No. of Crops	6	24	1	10	8	3	8	3	5	7	9	4	5	3	2	2	8	6	8			

FM = fresh market. PR = processing.

