2020 VEGETABLE CHEMICAL USE SURVEY

OMB No. 0535-0218 Approval Expires: 9/30/2023 Project Code: 136 SurveyID: 2069



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				ENTERPRISE
VERSION 01		POID	SUBTRACT	
	•		CONTACT RECORD	<u>-</u> !
DATE	TIME			NOTES
INTRODUC	TION:			
[Introduced you	ırself, and as	k for the operator. Rephrase	in your own words.]	
as possible. The person who will is conducted in applicable Federal Response is vortically application of infection of infection of infection of infection exists.	ne information Ifully disclose accordance eral laws. Fo Iduntary. e Paperwork formation unleading formation co ing data sour	n you provide will be used for es any identifiable information with the Confidential Informat ir more information on how we Reduction Act of 1995, an agass it displays a valid OMB co- illection is estimated to average	statistical purposes o about you or your operion Protection provision e protect your information gency may not conduction ontrol number. The value of the data needed, and	s and need your help to make the information as accurate only. Your responses will be kept confidential and any eration is subject to a jail term, a fine, or both. This survey ons of Title V, Subtitle A, Public Law 107-347 and other ation please visit: https://www.nass.usda.gov/confidentiality. Let or sponsor, and a person is not required to respond to, a lid OMB control number is 0535-0218. The time required to sponse, including the time for reviewing instructions, and completing and reviewing the collection of information.
				<u>H H M M</u> 004
BEGINNING TIM	E [MILITARY].			
□ Name, add	lress, and p	artners verified and update	ed if necessary.	
During the screening phase of the Vegetable Chemical Use Survey conducted in June and July, your operation was found to be growing or intending to grow vegetables this year. I now need to verify some of the information collected during the screening survey.				
Verify operation	on name an	d operator on label and/or	screener	

Verify operation name and operator on label and/or screener.

- If no changes, go to Section A, page 4.
- If changed, continue to Change in Operating Status on next page.

CHANGE IN OPERATOR STATUS

[Enumerator Note: Skip this section if there is no change	in operation name or operator.]	
	<u></u>	Code
Has there been a change in operation name or operation.	tor?	
[If item 1 = 1, continue If item 1 = 3, go to Enumerator Note below.]		
	Operation Name	_
	Operator Name	_
	Address	
	Di /	Check if cell phone
for the part of the year during which the over by a new operator. If the operator	s in business part of the 2020 crop year, complete this ques he operation did business, unless the operation has been or has changed midyear, please conduct this interview sta ding "Valid Substitution" rules in section 4 of the Interviewe	taken rt to
2. Has the operation printed on this questionnaire been☐ Yes - Go to Conclusion☐ No - Continue	combined or merged with any other farming operations?	

SCREENING

1.	1. Did this operation have any of the target crops during the 2020 crop year? [See page 5 for target crops.]				s.]
	Yes - Continue				
	No - Write notes expla	aining the situation then g	o to Conclusion on back pa	ige.	
2.	Are the day-to-day decisions for the	his operation (name on la	bel) made by [Check one	e]	
	one individual? [Go to	Section A]			
	a hired manager? [Go	to Section A]			
	partners? [Continue]				
3.	How many individuals are involved				Number
	partners, including the partner nar then go to Section A. Partners joi landlords and tenants as partners	intly operate land and sha	are in decision making. Do	not include	
4.	Please identify the other person(s necessary corrections if names ha			rtners' names and	l make
Partners: POID			Partners: POID		
PAR	RTNER NAME		PARTNER NAME		
ADE	DRESS		ADDRESS		
CIT	Y STATE ZIP	PHONE NUMBER	CITY STA	ATE ZIP	PHONE NUMBER
PH	ONE NUMBER	Check if cell phone	PHONE NUMBER		Check if cell phone
Partners: POID			POID		
PAR	RTNER NAME		PARTNER NAME		
ADE	DRESS		ADDRESS		
CIT	Y STATE ZIP	PHONE NUMBER	CITY STA	TE ZIP	
PH	ONE NUMBER	Check if cell phone	PHONE NUMBER		Check if cell phone

A LAND OPERATED A

Acı	es (Operated		
		erator Action: If acreage on the insert is verified as correct, enter code 1 in box 801, then skip to n B. If acreage has changed, ask all questions.]	801	
No	wΙν	would like to ask about the total acres operated under this land arrangement.		
1.	Нο	w many acres does this operation	Acres	
	a.	own?	. 901	•
	b.	rent or lease from others or use rent free? EXCLUDE land used on an animal unit month (AUM) basis	902	·
	C.	rent to others?	905	•
2.	[Ca	alculate item 1a + 1b - 1c.] Then the total acres operated are:	900	•
	a.	Does this include the farmstead, all cropland, woodland, pastureland, wasteland, and government program land? ☐ Yes - [Continue]		
		□ No - [Make corrections, then continue.]		
The	ם רבו	maining questions in this survey refer to these [item 2] acres.		
		the total acres operated, how many acres are considered cropland? INCLUDE land in hay,	802	
J.		nmer fallow, cropland idle, cropland used for pasture and cropland in government programs		•
4.		the total acres operated, how many acres are vegetables? INCLUDE both target and non-target getables planted on the operation	803	

TARGET CROPS & CODES

	FLORIDA
613	Beans, Snap
808	Cabbage
766	Corn, Sweet
798	Cucumbers
736	Peppers, Bell
742	Squash
770	Tomatoes
752	Watermelons

	GEORGIA
613	Beans, Snap
808	Cabbage
766	Corn, Sweet
798	Cucumbers
824	Onions
736	Peppers, Bell
742	Squash
752	Watermelons

	ILLINOIS
613	Beans, Snap
738	Pumpkins

	INDIANA
738	Pumpkins
752	Watermelons

	MICHIGAN
701	Asparagus
613	Beans, Snap
798	Cucumbers
738	Pumpkins
742	Squash

	MINNESOTA
766	Corn, Sweet
855	Peas, Green

	New Jersey
736	Peppers, Bell
742	Squash

	NEW YORK
613	Beans, Snap
808	Cabbage
766	Corn, Sweet
824	Onions
738	Pumpkins
742	Squash

NORTH CAROLINA				
798	Cucumbers			
736	Peppers, Bell			
738	Pumpkins			
742	Squash			
752	Watermelons			

OHIO				
736	Peppers, Bell			
738	Pumpkins			

OREGON				
613	Beans, Snap			
766	Corn, Sweet			
824	Onions			
855	Peas, Green			
742	Squash			

PENNSYLVANIA	
Beans, Snap	
Pumpkins	

613 738

SOUTH CAROLINA 752 Watermelons

TEXAS				
808	Cabbage			
798	Cucumbers			
824	Onions			
738	Pumpkins			
752	Watermelons			

WASHINGTON				
701	Asparagus			
632	Carrots			
766	Corn, Sweet			
824	Onions			
855	Peas, Green			

WISCONSIN				
613	Beans, Snap			
808	Cabbage			
623	Carrots			
766	Corn, Sweet			
798	Cucumbers			
855	Peas, Green			

1. What target vegetable crops were on these [Section A, item 4] acres during the 2020 crop year? EXCLUDE new plantings of vegetables not intended for harvest in 2020.

	Table 001
Office Lines in	
Line 99	199

	1	2	3	4
L I N E			How many acres were planted for harvest in the 2020 crop year? (INCLUDE 2020 acres which were planted in other years.)	Were any herbicides, insecticides, fungicides, etc. applied to this crop? Yes = 1
	Crop	Crop Code	Acres	No = 3
01			·	13
02			11 •	13
03			11 •	13
04			11	13
05			11 •	13
06			11 •	13
07			11 •	13
80			·	13
09			11 •	13
10			·	13
11			11 •	13
12			11	13
13			11	13
14			11	13
15			11	13

Notes:

INCLUDE

- Target Crops Only
- All acreage of target crops for processing or fresh market
- All acreage equal to or greater than one tenth of an acre..
- All bearing acreage of target crops for roadside stands, farmer's markets or U-pick sales.
- Crops planted in the fall of 2019 if they were part of the 2020 crop.
- Double cropping

EXCLUDE

- All crops grown in another state.
- All crops grown in greenhouses, hothouses, and home gardens.
- Plantings of crops not intended for harvest in 2020.
- New plantings and other plantings which are not yet bearing (asparagus)..
- All vegetables grown for commercial transplanting.
- All mushrooms, potatoes, dry beans, sweet potatoes.
- All vegetable acreage grown for seed only.
- All vegetable acres grown by institutional, experimental, research and university farms.
- Non-target vegetables.

'-			

NOTES

[Enumerator Action: If pesticides were reported in Section B, column 4, continue. Otherwise, go to Section E.]

1. Now I need to get complete information on all of the chemicals applied, including applications made by you and/or by custom applicators during the 2020 crop year to each of the target vegetable crops you grew. Let's start with the first application to your crop since the 2019 crop year harvest.

INCLUDE all chemical applications to the target vegetable crops. Use supplemental tables if necessary. INCLUDE herbicides, insecticides, nematicides, miticides, fungicides, chemical thinners, growth regulators, microbial agents, pheromones, rodenticides, and soil fumigants.

EXCLUDE seed treatments, foliar applications of nutrients, and applications made to vegetables after harvest.

Office Use	Table	399
Lines in Table	001	

		1	2	3	4	5
	L I N			What products were applied to the [crop]?	Was this product bought in liquid or dry form?	Was this part of a tank mix? [If tank mix, enter
Chemical Product Name	Е	Crop	Crop Code	[Enter product code.]	[Enter L or D.]	line number of first product in mix.]
	01			61		63
	02			61		63
	03			61		63
	04			61		63
	05			61		63
	06			61		63
	07			61		63
	08			61		63
	09			61		63
	10			61		63
	11			61		63
	12			61		63
	13			61		63
	14			61		63
	15			61		63

Line No.	Pesticide Type (Herbicide, Insecticide, fungicide, etc.)	Trade Name and Formulation	Form Purchased (Liquid or Dry)	EPA Reg. No.

Codes for Column 8

1	Pounds	30	Grams	
12	Gallons	40	Kilograms	
13	Quarts	41	Liters	
14	Pints	46	Spirals	
15	Ounces, Liquid	47	Packets	
28	Ounces, Dry	50	Other (Specify:)

Office Use

300

	T		1	T	
	6	OR 7	8	9	10
L I N E	How much was applied per acre per application?	What was the total amount applied per application?	[Enter unit code from above.]	How many acres were treated with this product?	How many times was this product applied?
			Code	Acres	Number
01	65	73	74	77	79
02	65	73	74	77	79
03	65	73	74	77	79
04	65	73	74	77	79
05	65	73	74	77	79
06	65	73	74	77	79
07	65	73	74	77	79
08	65	73	74	77	79
09	65	73	74	77	79
10	65	73	74	77	79
11	65	73	74	77	79
12	65	73	74	77	79
13	65	73	74	77	79
14	65	73	74	77	79
15	65	73	74	77	79

Line No.	Pesticide Type (Herbicide, Insecticide, fungicide, etc.)	Trade Name and Formulation	Form Purchased (Liquid or Dry)	EPA Reg. No.

						<u> </u>
		1	2	3	4	5
Chemical	L I N E			What products were applied to the [crop]?	Was this product bought in liquid or dry form?	Was this part of a tank mix? [If tank mix, enter line number of first
Product Name	-	Crop	Crop Code	[Enter product code.]	[Enter L or D.]	product in mix.]
	16			61		63
	17			61		63
	18			61		63
	19			61		63
	20			61		63
	21			61		63
	22			61		63
	23			61		63
	24			61		63
	25			61		63
	26			61		63
	27			61		63
	28			61		63
	29			61		63
	30			61		63
	31			61		63
	32			61		63
	33			61		63

Line No.	Pesticide Type (Herbicide, Insecticide, fungicide, etc.)	Trade Name and Formulation	Form Purchased (Liquid or Dry)	EPA Reg. No.

Codes for Column 8

1 Pounds	30 Grams
12 Gallons	40 Kilograms
13 Quarts	41 Liters
14 Pints	46 Spirals
15 Ounces, Liquid	47 Packets
28 Ounces, Dry	50 Other

	6	OR	7	8	9	11
L – N E	How much was applied per acre per application?		What was the total amount applied per application?	[Enter unit code from above.]	How many acres were treated with this product? [Include bearing acres only.]	How many times was this product applied?
				Code	Bearing Acres	Number
16	65	73	•	74	77	79
17	65	73	•	74	77	79
18	65	73	•	74	77	79
19	65	73	•	74	77	79
20	65	73	•	74	77	79
21	65	73	•	74	77	79
22	65	73	•	74	77	79
23	65	73	•	74	77	79
24	65	73	•	74	77	79
25	65	73		74	77	79
26	65	73	•	74	77	79
27	65	73	•	74	77	79
28	65	73		74	77	79
29	65	73		74	77	79
30	65	73	•	74	77	79
31	65	73	•	74	77	79
32	65	73	•	74	77	79
33	65	73	<u>-</u>	74	77	79

Line No.	Pesticide Type (Herbicide, Insecticide, fungicide, etc.)	Trade Name and Formulation	Form Purchased (Liquid or Dry)	EPA Reg. No.

NOTES

Now I have some questions about pest management practices you may have used on any of the total vegetable acres on this operation. INCLUDE both target and non-target vegetable crops grown. By pests, we mean insects, weeds, and diseases.

[Er	Enumerator Action: Were pesticide applications reported in Section B, column 5 on page 5?]					
	Yes - Continue					
					Code	
1.	Was weather data used to assist in determining applications?		Yes=1 No=3	600		
2.	Were any biological pesticides such at Bt (Baci	s), insect growth regulators, such				
	as Courier, intrepid, etc., neem or other natural manage pests?		Yes=1 No=3	601		
3.	Were pesticides with different mechanisms of a purpose of keeping pests from becoming resist		Yes=1 No=3	602		
			ely going to the vegetable acres or scouting activities. Enter code 1 m 5.			
4.	In 2020, how were your vegetable acres primarily scouted for insects, weeds,	-			Code	
	diseases and/or beneficial organisms?		g general observations while outine tasks. Enter code 2 and go to		608	
			e acres were not scouted. Enter o to item 10.			
					Code	
5.	Was an established scouting process used suctraps, etc., on any vegetable acres?			Yes=1 No=3	609	
6.	Was scouting for pests done on these vegetabl	e acres due to		'	Code	
				Yes=1	610	
	a. a pest advisory warning?			No=3		
	b. a pest development model?			Yes=1 No=3	611	
		1	2			
		ı	[If column 1 = Yes, ask] Who did the majority of the scouting to	for [colu	umn 1]?	
			1 Operator, partner or family mem	ber		
			2 An employee			
			3 Farm supply or chemical dealer 4 Independent crop consultant or		arcial scout	
7	Were your vegetable acres scouted for		5 Processor	JOHIIII	iolal 300at	
	volo your vogotable dolor cocated for	Yes = 1	6 Other: (specify:)	
		No = 3	Code			
	a. weeds?	612	614			
	b. insects or mites?	615	617			
	c. disease?	618	620			

controlled drainage, or treatment of retention water used to manage pests?.....

COMPLETION CODE for PESTICIDE APPLICATIONS	
1 Incomp/R 3 Valid Zero	300

COMPLETION CODE for PEST MANAGEMENT PRACTICES		
1 Incomp/R	500	

Enumerator Note:	For the remaining que	stions, primary	target crop is	s defined as the	largest target	crop by acres	planted for
harvest in 2020, a	s reported in Section B,	Question 1.					

	Crop Name	Crop Code
The primary target crop on this operation is:		

1. Were any of the following pesticide spraying practices or activities used on this operation for [insert primary target crop] in 2020? Pesticides include insecticides, fungicides, herbicides, bactericides, nematicides, and plant growth regulators (PGR).

		1	2	3	4
Pestic	ide Spraying Practice or Activity		Was it specifically used to keep pesticide application(s) on target (i.e., reduce pesticide drift)?	[Complete column for every Yes in Column 1.] Considering labor, training, capital expenditures, and other costs, how easy or difficult was it to implement this practice or activity?	[Complete column for every No in Column 1.] Why was this practice or activity not used? List all that apply.
		1 Yes 3 No 99 Don't Know	1 Yes 3 No 99 Don't Know	Very Easy Somewhat Easy Somewhat Difficult Very Difficult	1 Cost of labor/training 2 Cost of associated equipment/products 3 Incompatible with current production practices (e.g., topography, equipment limitations) 4 General time management issue/too busy 5 Unfamiliar with activity or practice 6 Other, specify:
a.	Altering spray time(s) depending on weather conditions (e.g., wind speed, wind direction)	5170	5171	5172	5173 5174 Specify:
b.	Calibrate sprayer before the season	5190	5191	5192	5193 5194 Specify:
C.	Calibrate sprayer during the season	5195	5196	5197	5198 5199 Specify:
d.	Manually altering sprayer settings to improve the spray precision (e.g., altering spray pressure, ground speed, and/or boom height)	5200	5201	5202	5203 5204 Specify:
e.	Electronic eye/infra-red or other sensor-based technology (e.g., sonar)	5165	5166	5167	5168 5169 Specify:
f.	Other technologies to improve the spray precision (e.g., on/off nozzle spray technology, GPS technology, variable-rate technology)	5205	5206	5207	5208 5209 Specify:

		,,		-
(Continued)	1	2	3	4
Pesticide Spraying Practice or Activity	Was this used in 2020?	Was it specifically used to keep pesticide application(s) on target (i.e., reduce pesticide drift)?	[Complete column for every Yes in Column 1.] Considering labor, training, capital expenditures, and other costs, how easy or difficult was it to implement this practice or activity?	[Complete column for every No in Column 1.] Why was this practice or activity no used? List all that apply.
	1 Yes 3 No 99 Don't Know	1 Yes 3 No 99 Don't Know	Very Easy Somewhat Easy Somewhat Difficult Very Difficult	1 Cost of labor/training 2 Cost of associated equipment/products 3 Incompatible with current production practices (e.g., topography, equipment limitations) 4 General time management issue/too busy 5 Unfamiliar with activity or practice 6 Other, specify:
g. Pulse Width Modulation (PWM) (e.g., Aim Command, Raven's Hawk Eye, John Deere's Exact Apply)	5215	5216	5217	5218 5219 Specify:
h. Other - Specify: 5225	5220	5221	5222	5223 5224 Specify:
Check all that apply. 5261 Computer cali 5262 Change in pro 5263 Observed cha 5264 Scheduled ca	bration alert synduct being applance in spray p	ystem olied attern (e.g., fro daily, monthly, a	rayer re-calibration for [insert p m worn nozzles)	orimary target crop] in 2020?
when moving		hock of Grop		

	⁵²⁶⁶ Other, specify: ⁵²⁶⁸
	5267 None of the above
3.	Excluding application of herbicides, which of the following methods of spraying did this operation use to apply insecticide/fungicide/bactericides/nematicides/plant growth regulator for [insert primary target crop] in 2020? Check all that apply.
	5405 Ground boom sprayer(s)
	5406 Aerial application(s)
	5407 Spot treatments (e.g., backpack sprayers)
	5410 Chemigation (such as through drip irrigation or micro-sprinklers)
	5414 Air blast / Air-assisted sprayer(s)
	⁵⁴¹³ Other, specify: ⁵⁴⁰⁰

4. Pre-emergence pesticide applications are pesticides that are applied both prior to planting and/or before the vegetables for early-season pest management. Pesticides include insecticides, fungicides, herbicide bactericides, nematicides, and plant growth regulators (PGR). Did this operation make any pre-emergence applications using air blast sprayers and/or ground boom sprayers for [insert primary target crop] in 2020? Yes, made pre-emergence pesticide applications using air blast/air-assisted sprayer(s) - Complete Season No. did not make pre-emergence pesticide applications and ground boom sprayers - Complete Column				ecticides, fungicides, herbicides, ation make any pre-emergence pesticide primary target crop] in 2020? ssisted sprayer(s) - Complete Column 1 sprayers - Complete Column 2
		- No, did not make pre-eme	rgence pesticide applications - Go to item t	2
			For Air Blast/Air-assisted Sprayer(s) Systems	For Ground Boom Systems
	a.	What pesticide type(s) were used in this [insert systems type] pre-emergence in 2020? Check all that apply.	5620 Insecticides 5621 Fungicides 5622 Herbicides 5623 Bactericides 5665 Nematicides 5624 Plant Growth Regulators (PGRs) 5625 Other: specify: 5626	5627 Insecticides 5628 Fungicides 5629 Herbicides 5630 Bactericides 5666 Nematicides 5631 Plant Growth Regulators (PGRs) 5632 Other: specify: 5633
	b.	What is the typical spray volume, in Gallons per Acre (GPA), for pesticide applications pre-emergence in 2020? Select one item only.	5634 1 Less than 25 GPA 2 25 to <50 GPA 3 50 to <75 GPA 4 75 to <100 GPA 5 100 to <200 GPA 6 200 or greater GPA 99 Don't Know	5635 1 Less than 5 GPA 2 5 to <7.5 GPA 3 7.5 to <10 GPA 4 10 to <15 GPA 5 15 to <20 GPA 6 20 to <25 GPA 7 25 or greater GPA 99 Don't Know
	C.	What is the typical operating pressure, in PSI, for pesticide applications pre-emergence in 2020? Select one item only.	5636 1 Less than 50 PSI 2 50 to <75 PSI 3 75 to <100 PSI 4 100 to <150 PSI 5 150 to <200 PSI 6 200 or greater PSI 99 Don't Know	5637 1 Less than 10 PSI 2 10 to <20 PSI 3 20 to <30 PSI 4 30 to <40 PSI 5 40 to <50 PSI 6 50 to <60 PSI 7 60 to <70 PSI 8 70 to <80 PSI 9 80 to <90 PSI 10 90 PSI or greater 99 Don't know
	d.	What is the typical nozzle used when spraying pesticide applications pre-emergence in 2020? Select one item only.	5667 1 Hollow Cone 2 Full Cone 3 Disc/Core Nozzle 4 Flat fan 5 Air-inclusion (Al) Air-induction 6 Other, specify:5681 99 Don't Know	5638 1 Hollow Cone 2 Full Cone 3 Disc/Core Nozzle 4 Flat fan 5 Air-inclusion (AI)/Air-induction/Venturi 6 Other, specify: 5639 99 Don't Know

	1	2
(Continued)	For Air Blast/Air-assisted Sprayer(s) Systems	For Ground Boom Systems
e. What is the typical ground speed when spraying pesticide applications pre-emergence in 2020? Select one item only.	5640 1 Less than 1 mph 2 1 to <2 mph 3 2 to <3 mph 4 3 to <4 mph 5 4 to <5 mph 6 5 mph or greater 99 Don't Know	5641 1 Less than 1 mph 2 1 to <2 mph 3 2 to <3 mph 4 3 to <4 mph 5 4 to <5 mph 6 5 to <6 mph 7 6 to <7 mph 8 7 mph or greater 99 Don't know
f. What is the typical boom height above the ground when spraying pesticide applications pre- emergence in 2020? Select one item only.	5668 1 <24 inches 2 24 to <36 inches 3 36 inches or greater 99 Don't know	5642 1 <24 inches 2 24 to <36 inches 3 36 inches or greater 9 Don't know
g. What is the typical target droplet size spectrum for pesticide applications pre-emergence in 2020? Select one item only.	5643 1 Less than 106 microns (Extremely Fine or Very Fine) 2 106-235 microns (Fine) 3 236-340 microns (Medium) 4 341-403 microns (Coarse) 5 404-502 microns (Very Coarse) 6 503-665 microns (Extremely Coarse) 7 Greater than 665 microns (Ultra Coarse) 99 Don't Know	5644 1 Less than 106 microns (Extremely Fine or Very Fine) 2 106-235 microns (Fine) 3 236-340 microns (Medium) 4 341-403 microns (Coarse) 5 404-502 microns (Very Coarse) 6 503-665 microns (Extremely Coarse) 7 Greater than 665 microns (Ultra Coarse) 99 Don't Know
h. For which of the following reasons did this operation change the airspeed (in revolutions per minute, or RPM)pre-emergence in 2020? Check all that apply.	Crop stage 5646 Change of product(s) 5647 Use of specialty Plant Growth Regulator (PGR) applications (e.g., for thinning or finish) 5648 Moving between blocks 5649 Wind speed or wind direction 5650 Other, specify: 5651 Never	
 i. Which of the following practices were used pre-emergence in 2020? Check all that apply. 	5675 Drift reducing adjuvant(s) 5676 Drift reducing nozzle(s) 5677 Shielded sprayers 5678 Don't know	Drift reducing adjuvant(s) 5654 Drift reducing nozzle(s) 5655 Shielded sprayers 5674 Don't know

E-1

5. Post-emergence pesticide applications are made to control pests that occur after emergence of the veg Pesticides include insecticides, fungicides, herbicides, bactericides, nematicides, and plant growth regu Did this operation make any post-emergence pesticide applications using air blast sprayers and/or grous sprayers for [insert primary target crop] in 2020?				
	Yes, made post-emergence	e pesticide applications using air blast/air-a e pesticide applications using ground boon ergence pesticide applications - Go to item	n sprayers - Complete Column 2	
		1	2	
		For Air Blast/Air-assisted Sprayer(s) Systems	For Ground Boom Systems	
	a. What pesticide type(s) were used in this [insert systems type] post-emergence in 2020? Check all that apply.	5720 Insecticides 5721 Fungicides 5722 Herbicides 5723 Bactericides 5765 Nematicides 5724 Plant Growth Regulators (PGRs) 5725 Other: specify: 5726	5727 Insecticides 5728 Fungicides 5729 Herbicides 5730 Bactericides 5766 Nematicides 5731 Plant Growth Regulators (PGRs) 5732 Other: specify: 5733	
	b. What is the typical spray volume, in Gallons per Acre (GPA), for pesticide applications post-emergence in 2020? Select one item only.	5734 1	5735 1 Less than 5 GPA 2 5 to <7.5 GPA 3 7.5 to <10 GPA 4 10 to <15 GPA 5 15 to <20 GPA 6 20 to <25 GPA 7 25 or greater GPA 99 Don't Know	
	c. What is the typical operating pressure, in PSI, for pesticide applications post-emergence in 2020? Select one item only.	5736 1 Less than 50 PSI 2 50 to <75 PSI 3 75 to <100 PSI 4 100 to <150 PSI 5 150 to <200 PSI 6 200 or greater PSI 99 Don't Know	5737 1 Less than 10 PSI 2 10 to <20 PSI 3 20 to <30 PSI 4 30 to <40 PSI 5 40 to <50 PSI 6 50 to <60 PSI 7 60 to <70 PSI 8 70 to <80 PSI 9 80 to <90 PSI 10 90 PSI or greater 99 Don't know	
	d. What is the typical nozzle used when spraying pesticide applications post-emergence in 2020? Select one item only.	5669 1 Hollow Cone 2 Full Cone 3 Disc/Core Nozzle 4 Flat fan 5 Air-inclusion (Al) Air-induction 6 Other, specify:5670 99 Don't Know	5738 1 Hollow Cone 2 Full Cone 3 Disc/Core Nozzle 4 Flat fan 5 Air-inclusion (Al)/Air-induction/Venture 6 Other, specify: 5739 99 Don't Know	

	1	2
(Continued)	For Air Blast/Air-assisted Sprayer(s) Systems	For Ground Boom Systems
e. What is the typical ground speed when spraying pesticide applications post-emergence in 2020? Select one item only.	5740 1 Less than 1 mph 2 1 to <2 mph 3 2 to <3 mph 4 3 to <4 mph 5 4 to <5 mph 6 5 mph or greater 99 Don't Know	5741 1 Less than 1 mph 2 1 to <2 mph 3 2 to <3 mph 4 3 to <4 mph 5 4 to <5 mph 6 5 to <6 mph 7 6 to <7 mph 8 7 mph or greater 99 Don't know
f. What is the typical boom height above the ground or plant canopy when spraying pesticide applications post-emergence in 2020? Select one item only.	5671 1 <24 inches 2 24 to <36 inches 3 36 inches or greater 9 Don't know	5742 1 <24 inches 2 24 to <36 inches 3 36 inches or greater 9 Don't know
g. What is the typical target droplet size spectrum for pesticide applications post-emergence in 2020? Select one item only.	5743 1 Less than 106 microns (Extremely Fine or Very Fine) 2 106-235 microns (Fine) 3 236-340 microns (Medium) 4 341-403 microns (Coarse) 5 404-502 microns (Very Coarse) 6 503-665 microns (Extremely Coarse) 7 Greater than 665 microns (Ultra Coarse) 99 Don't Know	5744 1 Less than 106 microns (Extremely Fine or Very Fine) 2 106-235 microns (Fine) 3 236-340 microns (Medium) 4 341-403 microns (Coarse) 5 404-502 microns (Very Coarse) 6 503-665 microns (Extremely Coarse) 7 Greater than 665 microns (Ultra Coarse) 99 Don't Know
h. For which of the following reasons did this operation change the airspeed (in revolutions per minute, or RPM)post-emergence in 2020? Check all that apply.	5745 Crop stage 5746 Change of product(s) 5747 Use of specialty Plant Growth Regulator (PGR) applications (e.g., for thinning or finish) 5748 Moving between blocks 5749 Wind speed or wind direction 5750 Other, specify: 5751 5752 Never	
 i. Which of the following practices were used post-emergence in 2020? Check all that apply. 	Drift reducing adjuvant(s) 5776 Drift reducing nozzle(s) 5777 Shielded sprayers 5778 Don't know	Drift reducing adjuvant(s) 5754 Drift reducing nozzle(s) 5755 Shielded sprayers 5774 Don't know

6. Now we are going to ask a few questions about spray equipment maintenance in 2020.

		1	2
		For Air Blast/Air-assisted Sprayer(s)	-
		Systems	For Ground Boom Systems
		5457 Before the season	5271 Before the season
a.	How often did this operation	Delote the season	Delote the season
	clean the system(s) in 2020?	Aitel the season	Aitel the season
	Check all that apply.	Depended on the product(s)	Depended on the product(s)
		⁵⁴⁶⁰ When switching from USDA	⁵²⁷⁸ When switching from USDA
	[If the never box is checked for	certified organic to conventional	certified organic to conventional
	Item 5464 in Column 1 or 5276	blocks	blocks
	in Column 2, then skip item 6b	⁵⁴⁶¹ Regularly scheduled cleaning	⁵²⁷⁴ Regularly scheduled cleaning
	and go to 6c; otherwise go to	⁵⁴⁶² Other: specify:	⁵²⁷⁵ Other: specify:
	6b.]	5463	5277
		⁵⁴⁶⁴ Never	⁵²⁷⁶ Never
		5473	5279
		₁ Always (100%)	₁ Always (100%)
b.	For each time that the system(s)	2 Often (51% or more)	2 Often (51% or more)
	was cleaned, how often was a tank cleaner used?	3 Sometimes (50% or less)	3 Sometimes (50% or less)
	tank cleaner used?	4 Never (0%)	4 Never (0%)
		99 Don't know	99 Don't know
		5672	5673
C.	Did this operation use separate	1 Yes	1 Yes
	spray rigs for herbicides?	3 No	3 No
		99 Don't know	99 Don't know
		⁵⁴⁸¹ Regularly scheduled calendar	⁵⁴⁹¹ Regularly scheduled calendar
		based replacement (i.e.,	based replacement (i.e.,
		annually, twice annually,	annually, twice annually,
		monthly, etc.)	monthly, etc.)
		⁵⁴⁸² Regularly scheduled	⁵⁴⁹² Regularly scheduled
		replacement based on	replacement based on
		operating time (I.e., sprayer	operating time (I.e., sprayer
		operating hours)	operating hours)
		5483 Sporadic replacement based	5493 Sporadic replacement based
		on area covered or general	on area covered or general
		intuition (i.e., it feels like the	intuition (i.e., it feels like the
		right time to change nozzles)	right time to change nozzles)
d.	What were the most common	5484 Calibration problems (i.e.,	5494 Calibration problems (i.e., too
	reasons for replacing the	too high or too low a flow rate)	high or too low a flow rate)
	nozzles on the sprayers in	5485 Observed nozzle damage	5495 Observed nozzle damage
	2020? Check all that apply.	(e.g., change in spray pattern	(e.g., change in spray pattern
		or leaks)	or leaks)
		5486 Availability of new nozzle	5496 Availability of new nozzle
		technologies	technologies
		5487 Expert and/or consultant	5497 Expert and/or consultant
		recommendations (e.g.,	recommendations (e.g.,
		Cooperative Extension, crop	Cooperative Extension, crop
		consultants, etc.)	consultants, etc.)
		5488 Other, please specify:	5498 Other, please specify:
		5480 Other, please specify.	5490 Other, please specify.
		⁵⁴⁸⁹ None of the above	None of the above

NOTES

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	this operation use hedge rows or other vector canopy for drift reduction in 2020	wind-breaking structures that are at least one ?
5300 1 0%	₂ 1% to 25%	₃ 26% to 50%
₄ 51% to 75%	₅ 76% to 100%	99 Don't know

8. How often were the following practices used during the season to manage herbicide, fungicide and insecticide resistance in 2020?

	Only complete if operation uses herbicides	Only complete if operation uses fungicides	Only complete if operation uses insecticides
Practice to Manage Resistance for Herbicide, Fungicide and Insecticide	How often was each practice used on this operation to manage herbicide resistance?	How often was each practice used on this operation to manage fungicide resistance?	How often was each practice used on this operation to manage insecticide resistance?
	1 Always (100%) 2 Often (51% or more) 3 Sometimes (50% or less) 4 Never (0%) 99 Don't know	1 Always (100%) 2 Often (51% or more) 3 Sometimes (50% or less) 4 Never (0%) 99 Don't know	1 Always (100%) 2 Often (51% or more) 3 Sometimes (50% or less) 4 Never (0%) 99 Don't know
a. Scouting	5510	5511	5512
b. Field mapping weeds and/or keeping records of field history and pesticide use to assist pesticide decisions	5332	5333	5334
c. Field Management/Sanitation Practices			
For weed control (e.g., managing weeds in field borders, tillage, preventing field-to-field and within field movement of weed seed)	5335		
ii. For disease control (e.g., removing or incorporating unharvested vegetable and/or other field litter)		5336	
iii. For insect control (e.g., removing or incorporating unharvested vegetable and/or other field litter)			5337
d. Planting disease-resistant cultivars and/or rootstock		5338	
e. Use of pest diagnostic tools (e.g., Integrated Pest Management (IPM) treatment thresholds, predictive weather models (e.g., degree day models), pest forecasting systems, and/or assistance from diagnostic networks)		5342	5343
f. Pesticide Mode of Action (MOA) rotation	5344	5345	5346
g. Pesticide Mode of Action (MOA) combination (i.e., tank mix or pre-mix product)	5347	5348	5349
h. Rotating crops	5387	5388	5389

9. How often were the following sources of information used to inform pest management decisions in 2020?

Sources of Information	How often was this source of information used? 1 Always (100%) 2 Often (51% or more) 3 Sometimes (50% or less) 4 Never (0%) 99 Don't know Code
a. Pesticide product labels	5301
b. University and/or Agricultural Cooperative Extension resources/recommendations	5303
c. Non-university literature, such as magazines or newspapers	5305
d. Grower/trade groups	5307
e. Pesticide sales representatives and/or farm supply distributors	5309
f. Crop consultants paid for by the operation	5311
g. Other grower(s)	5313
h. Non-university decision tools	5315
i. Weather forecasting tools	5317
j. Other, Specify: ⁵³¹⁹	5320

[If 9b, column 1 = 1, 2, or 3, ask--]

10. Which of the following types of services offered by the University and/or Agricultural Cooperative Extension were most often used as sources of pest management decisions in 2020?

University and/or Agricultural Cooperative Extension Services	How often was this source of information used? 1 Always (100%) 2 Often (51% or more) 3 Sometimes (50% or less) 4 Never (0%) 99 Don't know
	Code
a. Formal presentations (e.g., annual meetings, educational training)	5322
b. Field days/demonstration workshops	5323
c. Farm visits and/or one-on-one consultation	5324
d. Email lists	5325
e. Newsletters	5326
f. Crop and/or Pest Protection Handbook	5327
g. Other publications (e.g., fact sheets)	5328
h. Decision tools	5329
i. Other, Specify: ⁵³³⁰	5331

11.		to reduce off-target impacts to plants, pollinators, and/or beneficial insects, did this operation communicate sult any of the following sources in 2020? Check all that apply.
	5351	Neighboring crop producers
	5352	Nearby beekeepers
	5353	A local expert, such as an Agricultural Cooperative Extension agent
	5354	State managed pollinator protection plans, or MP3s (MP3s are state-developed efforts that intend to reduce pesticide exposure through timely communication and coordination among beekeeper growers, pesticide applicators, and landowners)
	5355	Driftwatch - Driftwatch is a voluntary communication tool that enables crop producers, beekeeper and pesticide applicators to work together to protect crops and apiaries through the use of mapping programs.
	5356	Other communication tool(s), Specify: 5358
	5357	Other, Specify: ⁵³⁵⁹

12. How often were the following Best Management Practice (BMPs) used during the season in 2020?

	W often were the following Best Management Flactice	· ,	
	Best Management Practices	How often was this practice used? 1 Always (100%) 2 Often (51% or more) 3 Sometimes (50% or less) 4 Never (0%) 99 Don't know	[Only answer if column 1 = 1, 2, or 3] Was this practice specifically used to prevent exposure to bees? 1 Always (100%) 2 Often (51% or more) 3 Sometimes (50% or less) 4 Never (0%) 99 Don't know
a.	Avoid bloom time applications	5520	5521
b.	Make applications when temperatures are below 50°F	5522	5523
C.	Maintain buffer between known beehive locations	5524	5525
d.	Select pesticides that have the lowest residual toxicity to bees	5526	5527
e.	Use alternative application methods of an active ingredient to prevent bee exposure (e.g., non-foliar applications when bees are foraging)	5528	5529
f.	Avoid applications when dew is forecast	5530	5531
g.	Manage blooming plants on the orchard floor before applying pesticides that are acutely toxic to bees (e.g., mowing)	5532	5533
h.	Make application(s) at nighttime or no more than two hours prior to sunset	5534	5535
i.	Other, Specify: 5536	5537	5538

13. Which of the	following auditing systems, if any, did this operation participate in during 2020? Check all that apply.
5361	GLOBAL G.A.P.
5362	State Quality Food (SQF) Program
5363	Other, Specify: ⁵³⁶⁵
5364	The operation did not participate in an auditing system
5369	Don't know

CONCLUSION

Survey Results: To receive the complete results of this survey on the release date, go to www.nass.usda.gov/results

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This completes the survey. Thank you for your help.

OFFICE USE									
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9921	9922	9923	9927	9928	923	9907	922	922 9906 9916	
Response Respondent		ondent	Mode		Enum.	POID		•	
1-Comp 2-R 3-Inac	9901	1-Op/Mgr 2-Spouse 3-Acct/Bkpr	9902	2-PATI (tel) 3-PAPI (Face-to Face)		9998	9989		· <u></u>
4-Office Hold		4-Partner 9-Other		•			Eval.		Change
		o outer					9900	9985	