AGRICULTURAL RESOURCE MANAGEMENT SURVEY

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NATIONAL AGRICULTURAL STATISTICS SERVICE

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SOYBEANS PRODUCTION PRACTICES REPORT FOR 2020

VERSION	ID	TRACT	SUBTRACT	C-TYPE
77	___ ___ ___ ___ ___ ___ ___ ___ ___	01	___ ___	120

CONTACT RECORD

DATE	TIME	NOTES

INTRODUCTION:

[Introduced yourself, and ask for the operator. Rephrase in your own words.]

The information you provide will be used for statistical purposes only. Your responses will be kept confidential and any person who willfully discloses any identifiable information about you or your operation is subject to a jail term, a fine, or both. This survey is conducted in accordance with the Confidential Information Protection provisions of Title V, Subtitle A, Public Law 107-347 and other applicable Federal laws. For more information on how we protect your information please visit: https://www.nass.usda.gov/confidentiality. Response is voluntary.

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a valid OMB control number. The valid OMB control number is 0535-0218. The time required to complete this information collection is estimated to average 50 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

We encourage you to refer to your farm records during the interview.

BEGINNING TIME [MILITARY] H H M M 0004 ___ ___ ___ ___

SCREENING BOX 0006

☐ [Name, address and partners verified and updated if necessary.]

POID ___ ___ ___ ___ ___ ___ ___ ___ ___ ___	POID ___ ___ ___ ___ ___ ___ ___ ___ ___ ___
PARTNER NAME	PARTNER NAME
ADDRESS	ADDRESS
CITY STATE ZIP PHONE NUMBER	CITY STATE ZIP PHONE NUMBER
POID ___ ___ ___ ___ ___ ___ ___ ___ ___ ___	POID ___ ___ ___ ___ ___ ___ ___ ___ ___ ___
PARTNER NAME	PARTNER NAME
ADDRESS	ADDRESS
CITY STATE ZIP PHONE NUMBER	CITY STATE ZIP PHONE NUMBER

A SPRING WHEAT FIELD SELECTION A

Total Planted Acres

1. How many total acres of spring wheat did this operation plant for the 2020 crop year?.....
. 0050 .

[If no acres planted, review Screening Survey Information Form, make notes, then go to Conclusion on back page.]

Total Number of Fields Planted

2. What is the total number of spring wheat fields that were planted on this operation?..... 0020

[If only one field, enter "1" and go to item 4.]

3. Please list these fields according to identifying name/number or describe each field. Then I will tell you which field has been selected.

[If there are more than 18 fields, make sure item 2 is total fields planted and list only the 18 fields closest to the operator's permanent residence. If respondent is unable to identify or describe the fields, use the Field Selection Grid Supplement.]

FIELD NAME, NUMBER OR DESCRIPTION	FIELD NAME, NUMBER OR DESCRIPTION
1	10
2	11
3	12
4	13
5	14
6	15
7	16
8	17
9	18

APPLY "RANDOM NUMBER" LABEL HERE

Office Use
OY Field Substituted
0022

[Enumerator Action: Circle the pair of numbers on the above label associated with the last numbered field in item 3. Select the field according to the number you circled on the label, and record the selected number. If only one field, enter "1".].....

Selected Field Number
0021

4. The field selected is_____(field name/number/description).
During this interview, the spring wheat questions will be about this selected spring wheat field.
[Be sure the operator can identify the selected field.]

5. How many acres of spring wheat were planted in this field for the 2020 crop?.....

Acres
1301 .___

C NUTRIENT or FERTILIZER APPLICATIONS--SELECTED FIELD C

	Code	Office Use Edit Table
1. Were commercial nutrients or fertilizers applied to the selected field for the 20 soybean crop? INCLUDE those from operators, landlords, and contractors..... Yes=1 No=3	0202	0200

[If commercial nutrient or fertilizer applied, continue, else go to Section D.]

	Number
2. How many commercial nutrient or fertilizer applications were made to the selected field for the 2019 crop? INCLUDE applications made by airplanes and custom applicators.....	0203

3. Now I need to record information for each application.

CHECKLIST

INCLUDE	EXCLUDE
☐ Custom applied nutrients or fertilizers	☐ Micronutrients
☐ Nutrients or fertilizers applied in the fall of 2018 and those applied earlier if the selected field was fallow in 2018.	☐ Unprocessed manure
☐ Commercially prepared manure or compost	☐ Nutrients or fertilizers applied to previous crops in the selected field
	☐ Lime and gypsum/landplaster

Office Use Lines in Table	Table 001	0299

Application Codes for Column 6

1 Broadcast, ground without incorporation
2 Broadcast, ground with incorporation
3 Broadcast, by aircraft
4 In seed furrow
5 In irrigation water
6 Chisel/injected or knifed in
7 Banded in or over row
8 Foliar or directed spray

LINE	2 Materials Used [Enter percentage analysis or actual pounds of plant nutrients applied per acre.] [Show Common Nutrients or Fertilizers in Respondent Booklet]				3 What quantity was applied per acre? [Leave this column blank if actual nutrients were reported]	4 [Enter material code] 1 Pounds 12 Gallons 19 Pounds of actual nutrients	5 When was this applied? 1 In the fall before seeding 2 In the spring before seeding 3 At seeding 4 After seeding	6 How was this applied? [Refer to code list above]	7 How many acres in the selected field were treated in this application? Acres
	N Nitrogen	P2O5 Phosphate	K2O Potash	S Sulfur					
01	31	32	33	34	36	37	38	39	40 .___
02	31	32	33	34	36	37	38	39	40 .___
03	31	32	33	34	36	37	38	39	40 .___
04	31	32	33	34	36	37	38	39	40 .___
05	31	32	33	34	36	37	38	39	40 .___
06	31	32	33	34	36	37	38	39	40 .___
07	31	32	33	34	36	37	38	39	40 .___
08	31	32	33	34	36	37	38	39	40 .___

NOTES:

D BIOCONTROL or PESTICIDE APPLICATIONS--SELECTED FIELD D

Now I have some questions about all the biocontrols or pesticides used on the selected field for the 2020 soybean crop, including both custom applications and applications made by this operation.

	Code	Office Use Edit Table
1. Were any herbicides, insecticides, fungicides or other biocontrols or pesticides used on this spring wheat field for the 2020 crop?..... Yes=1 No=3	0302	0300

[Probe for applications made in the fall of 2019 and those made earlier if the selected field was fallow.]

If no biocontrols or pesticides applied, go to Section E.

INCLUDE defoliants, fungicides, herbicides, insecticides, and other pesticides INCLUDE biological and botanical pesticides.	EXCLUDE adjuvants, nutrients or fertilizers reported earlier and seed treatments.	Office Use Line in Table	Table 001	0399

Chemical Product Name	LINE	2 What products were applied to the selected field? [Show product codes from Respondent Booklet.]	3 Was this product bought in liquid or dry form? [Enter L or D]	4 If this was part of a tank mix, enter line number of first product in mix.	5 When was this applied? 1 Before planting 3 At planting 4 After planting 5 Defoliation prior to harvest	6 How much was applied per acre per application?	OR 7 What was the total amount applied per application in the selected field?	8 [Enter unit code] 1 Pounds 12 Gallons 13 Quarts 14 Pints 15 Liquid Ounces 28 Dry Ounces 30 Grams
	01	61		63	64	65 ._____	73 ._____	74
	02	61		63	64	65 ._____	73 ._____	74
	03	61		63	64	65 ._____	73 ._____	74
	04	61		63	64	65 ._____	73 ._____	74
	05	61		63	64	65 ._____	73 ._____	74
	06	61		63	64	65 ._____	73 ._____	74
	07	61		63	64	65 ._____	73 ._____	74
	08	61		63	64	65 ._____	73 ._____	74
	09	61		63	64	65 ._____	73 ._____	74
	10	61		63	64	65 ._____	73 ._____	74
	11	61		63	64	65 ._____	73 ._____	74
	12	61		63	64	65 ._____	73 ._____	74
	13	61		63	64	65 ._____	73 ._____	74

2. For biocontrols or pesticides not listed in Respondent Booklet, specify--

Line	Pesticide Type (Herbicide, Insecticide, Fungicide, etc.)	EPA No. or Trade Name and Formulation	Form Purchased (Liquid or Dry)	Where Purchased (Ask only if EPA No. cannot be reported)
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Applications Codes for Column 9

1 Broadcast, ground without incorporation
2 Broadcast, ground with incorporation
3 Broadcast, by aircraft
4 In seed furrow
5 In irrigation water
6 Chiseled/injected or knifed in
7 Banded in or over row
8 Foliar or directed spray
9 Spot treatments

LINE	9 How was this product applied? [Enter code from above.]	10 How many acres in the selected field were treated with this product? Acres	11 How many times was it applied? Number	12 Were these applications made by-- 1 Operator, partner, or family member? 2 Custom applicator? 3 Employee/Other?
01	76	77 .___	79	80
02	76	77 .___	79	80
03	76	77 .___	79	80
04	76	77 .___	79	80
05	76	77 .___	79	80
06	76	77 .___	79	80
07	76	77 .___	79	80
08	76	77 .___	79	80
09	76	77 .___	79	80
10	76	77 .___	79	80
11	76	77 .___	79	80
12	76	77 .___	79	80
13	76	77 .___	79	80

E PEST MANAGEMENT PRACTICES E

Now I have some questions about your pest management decisions and practices used on the selected field for the 2020 soybean crop. By pests, we mean weeds, insects, and diseases.

[Enumerator Action: Were pesticide applications reported in Section D?]
☐ Yes - Continue ☐ No - Go to item 4

Code

1. Were weather data used to assist in determining either the need or when to make pesticide applications?..... Yes=1 No=3 | 0800
2. Were any biological pesticides such as Bt (*Bacillus thuringiensis*), insect growth regulators, neem or other natural/biological based products sprayed or applied to manage pests in the selected field?..... Yes=1 No=3 | 0801
3. Were pesticides with different mechanisms of action rotated or tank mixed for the primary purpose of keeping pests from becoming resistant to pesticides?..... Yes=1 No=3 | 0802
4. Were records kept for the selected field to track the activity or numbers of weeds, insects, or diseases?..... Yes=1 No=3 | 0823
5. Did you use published information on infestation thresholds to determine when to take measures to manage pests in the selected field?..... Yes=1 No=3 | 0824
6. In 2020, how was the selected field primarily scouted for insects, weeds, diseases, and/or beneficial organisms?..... Yes=1 No=3 | Code 0808

   1 By deliberately going to the field specifically for scouting activities [Enter code 1 and go to item 7.]
   2 By conducting general observations while performing routine tasks [Enter code 2 and go to item 9.]
   3 The selected field was not scouted. [Enter code 3 and go to item 11.]

.....

7. Was an established scouting process such as systematic sampling, recording counts, etc. used or were insect traps used in the selected field?..... Yes=1 No=3 | 0809
8. Was scouting for pests done in the selected field due to--
   a. a pest advisory warning?..... Yes=1 No=3 | 0810
   b. a pest development model?..... Yes=1 No=3 | 0811

1	2	3	4
9. Was this soybean field scouted for--	Yes=1 No=3	[If Yes, ask--] What was the infestation level for [column 1]? 1 Higher than normal 2 Normal 3 Lower than normal Code	[If column 2 = Yes, ask--] Who did the majority of the scouting for [column 1]? 1 Operator, partner or family member 2 An employee 3 Farm supply or chemical dealer 4 Independent crop consultant or commercial scout Code
a. weeds?.....	0812	0813	0814
b. insects or mites?.....	0815	0816	0817
c. diseases?.....	0818	0819	0820

		Code
10. Did you use field mapping of previous weed problems to assist you in making weed management decisions?	Yes=1 No=3	0825
11. Did you do any of the following other types of pest management for the specific purpose of managing or reducing the spread of pests in the selected field?		Code
a. Use the services of a diagnostic laboratory for pest identification or soil plant tissue pest analysis for the selected field?	Yes=1 No=3	0841
b. Plow down crop residue using conventional tillage?	Yes=1 No=3	0842
c. Remove/burn down crop residue?	Yes=1 No=3	0843
d. Rotate crops in the selected field during the past three years?	Yes=1 No=3	0844
e. Maintain ground covers, mulches, or other physical barriers?	Yes=1 No=3	0845
f. Choose crop variety because of specific resistance to a certain pest?	Yes=1 No=3	0846
g. Use no-till or minimum till?	Yes=1 No=3	0847
h. Plan planting locations to avoid cross infestation of pests?	Yes=1 No=3	0848
i. Adjust planting or harvesting dates?	Yes=1 No=3	0849
j. Chop, spray, mow, plow, or burn field edges, lanes, ditches, roadways, or fence lines?	Yes=1 No=3	0850
k. Clean equipment and field implements after completing field work to reduce the spread of pests?	Yes=1 No=3	0851
l. Adjust row spacing, plant density, or row directions?	Yes=1 No=3	0852
m. Have the seed treated for insect or disease control after you purchased the seed for the selected field?	Yes=1 No=3	0854
n. Maintain a beneficial insect or vertebrate habitat?	Yes=1 No=3	0855
o. Maintain buffer strips or border rows to isolate spring wheat from non-organic crops or land, or did you take a buffer harvest?	Yes=1 No=3	0856
p. Use a flamer to kill weeds?	Yes=1 No=3	0857
q. Plant earlier or later to avoid weeds?	Yes=1 No=3	0865
		Code
12. Were any beneficial organisms, such as insects, nematodes, or fungi, applied or released in the selected field to manage pests?	Yes=1 No=3	0853
13. Were floral lures, attractants, repellants, pheromone traps, or other biological pest controls used on the selected field?	Yes=1 No=3	0858
14. Was a trap crop, excluding fallow, grown to help manage insects in the selected field?	Yes=1 No=3	0863
15. Was the selected field left fallow in 2018 to help manage insects on the selected field?	Yes=1 No=3	0864
		Code
16. Were water management practices such as irrigation scheduling, controlled drainage, or treatment of retention water used on the selected field to manage pests or toxin-producing fungi and bacteria?	Yes=1 No=3	0861

Completion Code for Pest Management Data	
1 Incomplete/Refusal	0500

E-1 PEST MANAGMENT PRACTICES E-1

1. For the selected field, were any of the following pesticide spraying practices or activities used in 2020? Pesticides include insecticides, fungicides, herbicides nematicides and plant growth regulators (PGR).

{Enumerator Note: Column 4: Choose items 1 – 5 and/or 6 for a write-in response.}

[Pesticide Spraying Practice or Activity	1. Was this used in 2020? 1 Yes 3 No 99 Don't Know	2 [Complete column for every "Yes" in Column 1.] Was it specifically used to keep pesticide application(s) on target (i.e., reduce pesticide drift)? 1 Yes 3 No 99 Don't Know	3 [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? 1 Very Easy 2 Somewhat Easy 3 Somewhat Difficult 4 Very Difficult	4 [Complete column for every "No" in Column 1.] Why was this practice or activity not used? Check all that apply. 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 issues/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, temperature)	5170	5171	5172	5173 _____ 5174 Specify:_____
b. Drift reducing adjuvant(s)	5175	5176	5177	5178 _____ 5179 Specify:_____
c. Drift reducing nozzle(s)	5180	5181	5182	5183 _____ 5184 Specify:_____
d. Increased gallons per acre (GPA) spray solution	5185	5186	5187	5188 _____ 5189 Specify:_____
e. Calibrate sprayer before the season	5190	5191	5192	5193 _____ 5194 Specify:_____
f. Calibrate sprayer during the season	5195	5196	5197	5198 _____ 5199 Specify:_____
g. 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:_____

(Continued) Pesticide Spraying Practice or Activity	1 Was this used in 2020? 1 Yes 3 No 99 Don't Know	2 [Complete column for every "Yes" in Column 1.] Was it specifically used to keep pesticide application(s) on target (i.e., reduce pesticide drift)? 1 Yes 3 No 99 Don't Know	3 [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? 1 Very Easy 2 Somewhat Easy 3 Somewhat Difficult 4 Very Difficult	4 [Complete column for every "No" in Column 1.] Why was this practice or activity not used? Check all that apply. 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 issues/too busy 5 Unfamiliar with activity or practice 6 Other, specify:
h. Adopting the use of technologies to improve the spray precision (e.g., on/off nozzle spray technology, GPS boom section controls, automatic boom height stabilization, and/or infrared technology)	5205	5206	5207	5208 _____ 5209 Specify:_____
i. Shielded sprayers	5210	5211	5212	5213 _____ 5214 Specify:_____
j. Pulse Width Modulation (PWM) (e.g., Aim Command, Raven's Hawk Eye, John Deere's Exact Apply)	5215	5216	5217	5218 _____ 5219 Specify:_____
k. Other - Specify: 5225 _____	5220	5221	5222	5223 _____ 5224 Specify:_____

2. Pre-emergence pesticide applications are pesticides that are applied both prior to planting and/or before the emergence of the soybeans for early-season pest management. For the selected field, did this operation make any pre-emergence pesticide applications using aerial sprayers and/or ground boom sprayers in 2020?

5231 ☐ Yes, made pre-emergence pesticide applications using ground boom sprayers - Complete table below

5230 ☐ Yes, made pre-emergence pesticide applications using aerial sprayers - Go to item 3

5232 ☐ No, did not make pre-emergence pesticide applications - Go to item 3

	Pre-emergence Pesticide Applications Using Ground Boom Sprayers		Code
a. What was the typical spray volume (gallons per acre-GPA) for pre-emergence pesticide applications?	1 <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 GPA or greater 99 Don't know	5233
b. What is the typical operating pressure for pre-emergence pesticide application (PSI)?	1 <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 to <100 PSI 11 100 PSI or greater 99 Don't know	5234
c. What nozzles were typically used most often for any pre-emergence pesticide applications? (Select one)	1 Hollow Cone 2 Full Cone 3 Disc/Core Nozzle 4 Flat (e.g., flat fan)	5 Air-inclusion (AI), Air-induction, Venturi 6 Other: specify: 5236_____ 99 Don't know	5235
d. At what ground speed was this ground boom sprayer(s) typically driven during pre-emergence pesticide applications?	1 <5 MPH 2 5 to <10 MPH 3 10 to <15 MPH	4 15 to <20 MPH 5 20 MPH or greater 99 Don't know	5237
e. At what boom height above ground or crop canopy did this operation typically spray during pre-emergence pesticide applications?	1 <24 inches 2 24 to <36 inches	3 36 inches or greater 99 Don't know	5238
f. What is the target droplet size spectrum for pre-emergence pesticide applications?	1 extremely fine or very fine (Less than 106 microns) 2 fine 106-235 microns 3 medium (236-340 microns) 4 coarse (341-403 microns)	5 very coarse 404-502 microns 6 extremely coarse (503-665 microns) 7 ultra coarse (Greater than 665 microns) 99 Don't know	5239

3. Post-emergence herbicide applications are made to control weeds that occur after emergence of the soybeans. For the selected field, did this operation make any post-emergence herbicide applications using aerial sprayers and/or ground boom sprayers in 2020?

5241 ☐ Yes, made post-emergence herbicide applications using ground boom sprayers - Complete table below

5240 ☐ Yes, made post-emergence herbicide applications using aerial sprayers - Go to item 4

5242 ☐ No, did not make post-emergence herbicide applications - Go to item 4

	Post-emergence Herbicide Applications Using Ground Boom Sprayers		Code
a. What was the typical spray volume (gallons per acre-GPA) for post-emergence herbicide applications?	1 <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 GPA or greater 99 Don't know	5243
b. What is the typical operating pressure for post-emergence herbicide application (PSI)?	1 <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 to <100 PSI 11 100 PSI or greater 99 Don't know	5244
c. What nozzles were typically used most often for any post-emergence herbicide applications? (Select one)	1 Hollow Cone 2 Full Cone 3 Disc/Core Nozzle 4 Flat (e.g., flat fan)	5 Air-inclusion (AI), Air-induction, Venturi 6 Other: specify: 5246_____ 99 Don't know	5245
d. At what ground speed was this ground boom sprayer(s) typically driven during post-emergence herbicide applications?	1 <5 MPH 2 5 to <10 MPH 3 10 to <15 MPH	4 15 to <20 MPH 5 20 MPH or greater 99 Don't know	5247
e. At what boom height above ground or crop canopy did this operation typically spray during post-emergence herbicide applications?	1 <24 inches 2 24 to <36 inches	3 36 inches or greater 99 Don't know	5248
f. What is the target droplet size spectrum for post-emergence herbicide applications?	1 extremely fine or very fine (Less than 106 microns 2 fine (106-235 microns) 3 medium (236-340 microns) 4 coarse (341-403 microns)	5 very coarse (404-502 microns) 6 extremly coarse (503-665 microns) 7 ultra coarse (Greater than 665 microns) 99 Don't know	5249

4. Post-emergence insecticide and/or fungicide applications are made to control pests that occur after emergence of the soybeans. For the selected field, did this operation make any post-emergence insecticide and/or fungicide applications using aerial sprayers and/or ground boom sprayers in 2020?

5251 ☐ Yes, made post-emergence insecticide/fungicide applications using ground boom sprayers - Complete table below

5250 ☐ Yes, made post-emergence insecticide/fungicide applications using aerial sprayers - Go to item 21

5252 ☐ No, did not make post-emergence insecticide/fungicide applications - Go to item 21

	Post-emergence Insecticide/Fungicide Applications Using Ground Boom Sprayers	Code
a. What was the typical spray volume (gallons per acre-GPA) for post-emergence insecticide/fungicide applications?	1 <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 GPA or greater 99 Don't know	5253
b. What is the typical operating pressure for post-emergence insecticide/fungicide application (PSI)?	1 <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 to <100 PSI 11 100 PSI or greater 99 Don't know	5254
c. What nozzles were typically used most often for any post-emergence insecticide/fungicide applications? (Select one)	1 Hollow Cone 2 Full Cone 3 Disc/Core Nozzle 4 Flat (e.g., flat fan) 5 Air-inclusion (AI), Air-induction, Venturi 6 Other: specify: 5256_____ 99 Don't know	5255
d. At what ground speed was this ground boom sprayer(s) typically driven during post-emergence insecticide/fungicide applications?	1 <5 MPH 2 5 to <10 MPH 3 10 to <15 MPH 4 15 to <20 MPH 5 20 MPH or greater 99 Don't know	5257
e. At what boom height above ground or crop canopy did this operation typically spray during post-emergence insecticide/fungicide applications?	1 <24 inches 2 24 to <36 inches 3 36 inches or greater 99 Don't know	5258
f. What is the target droplet size spectrum for post-emergence insecticide/fungicide applications?	1 extremely fine or very fine (Less than 106 microns) 2 fine (106-235 microns) 3 medium (236-340 microns) 4 coarse (341-403 microns) 5 very coarse (404-502 microns) 6 extremely coarse (503-665 microns) 7 ultra coarse (Greater than 665 microns) 99 Don't know	5259

5. For the selected field, which of the following spraying practices resulted in a sprayer re-calibration in 2020? Check all that apply.

5261 ☐ Computer calibration alert system

5262 ☐ Change in product being applied

5263 ☐ Observed change in spray pattern (e.g., from worn nozzles)

5264 ☐ Scheduled calibration (e.g., daily, monthly, annually)

5265 ☐ When moving to a different block or crop

5266 ☐ Other, specify: 5268_____

5267 ☐ None of the above

6. For the selected field, when did this operation clean the ground boom sprayer tank system in 2020? Check all that apply.

5271 ☐ Before the season

5272 ☐ After the season

5273 ☐ Depended on the product(s)

5274 ☐ Regularly scheduled cleaning

5275 ☐ Other, specify: 5277_____

5276 ☐ Never

[Enumerator Note: If respondent answered code 1 - 5 for item 22, ask item 22a and 22b, otherwise go to item 23. Skip 22b if no herbicides are used on the selected field.]

a. For each time that the ground boom sprayer was cleaned, how often was a tank cleaner used?..... 1 Always (100%) 2 Often (51% or more) 3 Sometimes (50% or less) 4 Never (0%) 99 Don't know ..... Code 5279

b. Did this operation use separate spray rigs for herbicide applications? Code 5280

1 ☐ Yes 3 ☐ No 99 ☐ Don't know.....

7. For the selected field, what material were a majority of the nozzles made of that were used across all pesticide applications made in 2020? Select one.

5281 1 ☐ Plastic, such as Polypropylene (i.e. Poly or PP) or other types

2 ☐ Aluminum, brass, or other soft metal(s)

3 ☐ Stainless steel including hardened stainless steel

4 ☐ Porcelain or other ceramic materials

5 ☐ Other, specify: 5282_____

8. For the selected field, what were the most common reasons for replacing the nozzles on the sprayers in 2020? Check all that apply.

5291 ☐ Regularly scheduled calendar-based replacement (i.e., annually, twice annually, monthly, etc.)

5292 ☐ Regularly scheduled replacement based on operating time (i.e., sprayer operating hours)

5293 ☐ Sporadic replacement based on area covered or general intuition (i.e., it feels like the right time to change nozzles)

5294 ☐ Calibration problems (i.e., too high or too low a flow rate)

5295 ☐ Observed nozzle damage (e.g., change in spray pattern or leaks)

5296 ☐ Availability of new nozzle technologies

5297 ☐ Expert and/or consultant recommendations (e.g., Cooperative Extension, crop consultants, etc.)

5298 ☐ Other, specify: 5290_____

5299 ☐ None of the above

9. For the selected field, on what proportion did this operation use hedge rows or other wind-breaking structures that are at least one and a half times the height of the crop canopy for drift reduction in 2020?.....

1	0%
2	1% to 25%
3	26% - 50%
4	51% - 75%
5	76% - 100%
99	Don't know

CODE

5300

NOTES:

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

Sources of Information	1 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	2 Which of these sources was this operation's primary source of pest management decisions? Select one. 1 Primary 2 Not primary Code
a. Pesticide product labels.....	5301	5302
b. University and/or Agricultural Cooperative Extension resources/recommendations.....	5303	5304
c. Non-university literature, such as trade magazines, catalogues, newspapers, etc	5305	5306
d. Commodity/trade groups	5307	5308
e. Pesticide sales representatives and/or farm supply distributors.....	5309	5310
f. Crop consultants paid for by the operation.....	5311	5312
g. Other grower(s).....	5313	5314
h. Commercial or other non-university decision tools.....	5315	5316
i. Weather forecasting tools.....	5317	5318
j. Other, Specify:5319 _____.....	5320	5321

11. [If 26b, column 1 equals 1, 2, or 3, ask--] 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 trainings).....	5322
b. Field days/demonstration workshops.....	5323
c. Farm visits and/or one-on-one consultation.....	5324
d. Email lists.....	5325
e. Newsletters and blogs.....	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

12. For the selected field, how often were the following practices used during the season to manage herbicide, fungicide and insecticide resistance in 2020?

Practice to Manage Resistance for Herbicide, Fungicide and Insecticide	Only complete if operation uses herbicides How often was each practice used on this operation to manage herbicide resistance? 1 Always (100%) 2 Often (51% or more) 3 Sometimes (50% or less) 4 Never (0%) 99 Don't know	Only complete if operation uses fungicides How often was each practice used on this operation to manage fungicide resistance? 1 Always (100%) 2 Often (51% or more) 3 Sometimes (50% or less) 4 Never (0%) 99 Don't know	Only complete if operation uses insecticides 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
a. Field mapping weeds and/or keeping records of field history and pesticide use to assist pesticide decisions.....	5332	5333	5334
b. Field Management/Sanitation Practices...			
i. For weed control (e.g., crop rotation, tillage, planting cover crops, managing field borders, preventing field-to-field and within field movement of weed seed).....	5335		
ii. For disease control (e.g., removing or incorporating field residue to reduce potential disease infestations, managing field borders)		5336	
iii. For insect control (e.g., removing or incorporating field residue to reduce potential insect infestations, managing field borders).....			5337
c. Planting insect-resistant (e.g. aphids) and/or disease-resistant varieties of soybeans.....	.....	5338	5339
d. Pre-harvest and/or post-harvest control of weeds and/or disease to reduce the return of weed seeds and/or seed-borne diseases.....	5340	5341	
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

13. In an effort to reduce off-target impacts to plants, pollinators, and/or beneficial insects, did this operation communicate with or consult 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 beekeepers, growers, pesticide applicators, and landowners)

5355 ☐ Driftwatch - Driftwatch is a voluntary communication tool that enables crop producers, beekeepers, and pesticide applicators to work together to protect crops and apiaries through the use of mapping programs.

5356 ☐ Other communication methods, Specify: 5358_____

5357 ☐ Other, Specify: 5359_____

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

Best Management Practices	1 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	2 [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 crop 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 in the field 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

15. Are the spraying practices for other fields in this operation similar to the spraying practices for this selected field?

5360
- 1 ☐ Yes
- 3 ☐ No - Please explain the difference: 5366 _____
- 99 ☐ Don't know

16. In 2020, which of the following auditing systems, if any, did this operation participate in? Check all that apply.

- 5361 ☐ GLOBAL G.A.P.
- 5362 ☐ Safe Quality Food (SQF) Program
- 5363 ☐ Other, specify: 5365 _____
- 5364 ☐ This operation did not participate in an auditing system
- 5369 ☐ Don't know

CONCLUSION

1. To receive the complete results of this survey on the release date, go to http://www.nass.usda.gov/Surveys/Guide_to_NASS_Surveys/
   To have a brief summary emailed to you at a later date, please enter your email address.

   1095

   [Enumerator Note: Thank the respondent, then review this questionnaire.]

H H M M

2. Ending time [Military]..... 0005 __ __ __

RECORD USE

3. [Did respondent use farm/ranch records to report--]

CODE

a. [fertilizer data?]..... Yes=1 No=3 0011

b. [pesticide data?]..... Yes=1 No=3 0012

SUPPLEMENTS USED

NUMBER

4. [Record the total number of each type of questionnaire supplement used to complete this interview.....

Fertilizer Supplements 0041

Pesticide Supplements 0042

Reported by:_____	9910 19 __M __M __D __D	9911 Telephone(_____)_____

OFFICE USE									
R. Unit	Ptr 1 Str	Ptr 2 Str	Ptr 3 Str	Ptr 4 Str	OPS	SSO 1	ADJ	Optional Use	
9921	9922	9923	9927	9928	923	9907	922	9906	9916

Response		Respondent		Mode		Enum.	POID	
1-Comp 2-R 3-Inac 4-Office Hold	9901	1-Op/Mgr 2-Spouse 3-Acct/Bkpr 4-Partner 9-Other	9902	2-PATI (tel) 3-PAPI (Face-to-Face)	9903	9998	9989	
							Eval.	Change
							9900	9985