# AGRICULTURAL RESOURCE MANAGEMENT SURVEY

OMB No. 0535-0218

Approval Expires: 7/31/2022 Project Code: 906

SurveyID: 2085 Phase 2

**NATIONAL AGRICULTURAL STATISTICS SERVICE**

U.S. Department of Agriculture National Operations Division 9700 Page Avenue, Suite 400 St. Louis, MO 63132-1547 Phone: 1-888-424-7828

Fax: 855-415-3687

E-mail: nass@usda.gov

## SOYBEANS PRODUCTION PRACTICES REPORT FOR 2020

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **VERSION 77** | **ID**  | **TRACT 01** | **SUBTRACT**  | **C-TYPE 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: http[s://www](http://www.nass.usda.gov/confidentiality).na[ss.usd](http://www.nass.usda.gov/confidentiality)a[.gov/confidentiality.](http://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

H H M M 0004

SCREENING BOX 0006

[MILITARY]

* [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

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

Total Planted Acres

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

**.**

0050

Total Number of Fields Planted

0020

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

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

1. 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 |  |

Office Use

APPLY "RANDOM NUMBER" LABEL HERE

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

1. 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.]

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

Acres

1301

**.**

1. **NUTRIENT or FERTILIZER APPLICATIONS**--SELECTED FIELD **C**
2. 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

Code

0200

0202

Office Use Edit Table

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

1. 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

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

|  |  |
| --- | --- |
| **CHECKLIST** |  |
| INCLUDECustom applied nutrients or fertilizersNutrients or fertilizers applied in the fall of 2018 and those applied earlier if the selected field was fallow in 2018.Commercially prepared manure or compost | EXCLUDEMicronutrients Unprocessed manureNutrients or fertilizers applied to previous crops in the selected fieldLime and gypsum/landplaster |
| Office Use Lines in Table | Table 001 | 0299 |

Application Codes for Column 6

1. Broadcast, ground without incorporation 5 In irrigation water
2. Broadcast, ground with incorporation 6 Chisel/injected or knifed in 3 Broadcast, by aircraft 7 Banded in or over row

4 In seed furrow 8 Foliar or directed spray

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| L I N E | 2Materials Used[Enter percentage analysis or actual pounds of plant nutrients applied per acre.][Show Common Nutrients or Fertilizers in Respondent Booklet] | 3What quantity was applied per acre?[Leave this column blank if actual nutrients were reported] | 4[Enter material code]1 Pounds12 Gallons19 Pounds of actual nutrients | 5When was this applied?1. In the fall before seeding
2. In the spring before seeding
3. At seeding
4. After seeding
 | 6How was this applied?[Refer to code list above] | 7How many acres in the selected field were treated in this application?Acres |
| NNitrogen | P2O5Phosphate | K2OPotash | SSulfur |
| 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:

1. **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.

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

Code

0300

0302

Office Use Edit Table

[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 pesticidesINCLUDE 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 | L I N E | 2What products were applied to the selected field? [Show product codes from Respondent Booklet.] | 3Was this product bought in liquid or dry form?[Enter L or D] | 4If this was part of a tank mix, enter line number of first product in mix. | 5When was this applied?1 Before planting1. At planting
2. After planting
3. Defoliation prior to harvest
 | 6 7OR | 8[Enter unit code]1 Pounds1. Gallons
2. Quarts
3. Pints
4. Liquid Ounces

28 Dry Ounces30 Grams |
| How much was applied per acre per application? | What was the total amount applied per application in the selected field? |
|  | 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 |

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

Pesticide Type

Where Purchased

Line

(Herbicide, Insecticide, Fungicide, etc.)

EPA No. or Trade Name and Formulation

Form Purchased (Liquid or Dry)

(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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| L I N E | 9How was this product applied?[Enter code from above.] | 10How many acres in the selected field were treated with this product?Acres | 11How many times was it applied?Number | 12Were 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 |

# 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?..............................................................................................................................
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?............................................................................................................................
3. Were pesticides with different mechanisms of action rotated or tank mixed for the primary purpose of keeping pests from becoming resistant to pesticides?.............................................
4. Were records kept for the selected field to track the activity or numbers of weeds, insects, or diseases?...................................................................................................................................
5. Did you use published information on infestation thresholds to determine when to take measures to manage pests in the selected field?......................................................................
6. By deliberately going to the field specifically for scouting activities [Enter code 1 and go to item 7.]
7. By conducting general observations while performing routine tasks [Enter code 2 and go to item 9.]
8. The selected field was not scouted. [Enter code 3 and go to item 11.]
9. In 2020, how was the selected field primarily scouted for insects, weeds, diseases, and/or beneficial organisms?.....................................

Yes=1 No=3

Yes=1 No=3

Yes=1 No=3

Yes=1 No=3

Yes=1 No=3

............

0800

Code

|  |
| --- |
| 0801 |
| 0802 |
| 0823 |
| 0824 |

Code

0808

1. Was an established scouting process such as systematic sampling, recording counts, etc. used or were insect traps used in the selected field?................................................................
2. Was scouting for pests done in the selected field due to--

a. a pest advisory warning?.....................................................................................................

b. a pest development model?................................................................................................

Yes=1 No=3

Yes=1 No=3

0811

0810

0809

Yes=1 No=3

|  |  |  |  |
| --- | --- | --- | --- |
| 19. Was this soybean field scouted for-- | 2Yes=1 No=3 | 3[If Yes, ask--]What was the infestation level for [column 1]?1. Higher than normal
2. Normal
3. Lower than normal

Code | 4[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 |

1. Did you use field mapping of previous weed problems to assist you in making weed management decisions?............................................................................................................

|  |  |
| --- | --- |
|  | Code |
| Yes=1 | 0825 |  |
| No=3 |  |  |
|  |  | Code |
| Yes=1 | 0841 |  |
| No=3 |  |  |
| Yes=1 | 0842 |  |
| No=3 |  |  |
| Yes=1 | 0843 |  |
| No=3 |  |  |
| Yes=1 | 0844 |  |
| No=3 |  |  |
| Yes=1 | 0845 |  |
| No=3 |  |  |
| Yes=1 | 0846 |  |
| No=3 |  |  |
| Yes=1 | 0847 |  |
| No=3 |  |  |
| Yes=1 | 0848 |  |
| No=3 |  |  |
| Yes=1 | 0849 |  |
| No=3 |  |  |
| Yes=1 | 0850 |  |
| No=3 |  |  |
| Yes=1 | 0851 |  |
| No=3 |  |  |
| Yes=1 | 0852 |  |
| No=3 |  |  |
| Yes=1 | 0854 |  |
| No=3 |  |  |
| Yes=1 | 0855 |  |
| No=3 |  |  |
| Yes=1 | 0856 |  |
| No=3 |  |  |
| Yes=1 | 0857 |  |
| No=3 |  |  |
| Yes=1 | 0865 |  |
| No=3 |  |  |
|  |  | Code |
| Yes=1 | 0853 |  |
| No=3 |  |  |
| Yes=1 | 0858 |  |
| No=3 |  |  |
| Yes=1 | 0863 |  |
| No=3 |  |  |
| Yes=1 | 0864 |  |
| No=3 |  |  |
|  |  | Code |
| Yes=1 | 0861 |  |
| No=3 |  |  |

1. 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?
	1. Use the services of a diagnostic laboratory for pest identification or soil plant tissue pest analysis for the selected field?.............................................................................................

b. Plow down crop residue using conventional tillage?............................................................

c. Remove/burn down crop residue?........................................................................................

1. Rotate crops in the selected field during the past three years?............................................
2. Maintain ground covers, mulches, or other physical barriers?.............................................
3. Choose crop variety because of specific resistance to a certain pest?................................

g. Use no-till or minimum till?...................................................................................................

h. Plan planting locations to avoid cross infestation of pests?..................................................

i. Adjust planting or harvesting dates?....................................................................................

1. Chop, spray, mow, plow, or burn field edges, lanes, ditches, roadways, or fence lines?......
2. Clean equipment and field implements after completing field work to reduce the spread of pests?...................................................................................................................................

l. Adjust row spacing, plant density, or row directions?...........................................................

m. Have the seed treated for insect or disease control after you purchased the seed for the selected field?......................................................................................................................

n. Maintain a beneficial insect or vertebrate habitat?...............................................................

o. Maintain buffer strips or border rows to isolate spring wheat from non-organic crops or land, or did you take a buffer harvest?.................................................................................

p. Use a flamer to kill weeds?..................................................................................................

q. Plant earlier or later to avoid weeds?...................................................................................

1. Were any beneficial organisms, such as insects, nematodes, or fungi, applied or released in the selected field to manage pests?...........................................................................................
2. Were floral lures, attractants, repellants, pheromone traps, or other biological pest controls used on the selected field?.........................................................................................................
3. Was a trap crop, excluding fallow, grown to help manage insects in the selected field?.............
4. Was the selected field left fallow in 2018 to help manage insects on the selected field?............
5. 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?.....................................................................................................................

|  |
| --- |
| 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 Yes3 No99 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 Yes3 No99 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 | 51735174Specify:  |
|  |  | 5175 | 5176 | 5177 | 5178 |
| b. | Drift reducing |  |  |  |  |
|  | adjuvant(s) |  |  |  | 5179Specify:  |
|  | 5180 | 5181 | 5182 | 5183 |
| c. Drift reducing |  |  |  |  |
| nozzle(s) |  |  |  | 5184Specify:  |
| d. Increased gallons per | 5185 | 5186 | 5187 | 5188 |
| acre (GPA) spray solution |  |  |  | 5189Specify:  |
|  |  | 5190 | 5191 | 5192 | 5193 |
| e. | Calibrate sprayer |  |  |  |  |
|  | before the season |  |  |  | 5194Specify:  |
|  | 5195 | 5196 | 5197 | 5198 |
| f. Calibrate sprayer |  |  |  |  |
| during the season |  |  |  | 5199Specify:  |
| g. | Manually altering sprayer settings to improve the spray precision (e.g., altering spray pressure, ground speed, and/or boom height) | 5200 | 5201 | 5202 | 52035204Specify:  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| (Continued)Pesticide Spraying Practice or Activity | 1Was this used in 2020?1 Yes3 No99 Don't Know | 2 | 3 | 4 |
| [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 Yes3 No99 Don't Know | [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
 | [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 | 52085209Specify:  |
| i. Shielded sprayers | 5210 | 5211 | 5212 | 52135214Specify:  |
| j. Pulse Width Modulation (PWM) (e.g., Aim Command, Raven's Hawk Eye, John Deere's Exact Apply) | 5215 | 5216 | 5217 | 52185219Specify:  |
| k. Other - Specify: | 5220 | 5221 | 5222 | 5223 |
| 5225 |  |  |  |  |
|  |  |  |  | 5224 |
|  |  |  |  | Specify:  |

1. 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

5230

5232

Yes, made pre-emergence pesticide applications using ground boom sprayers - Complete table below Yes, made pre-emergence pesticide applications using aerial sprayers - Go to item 3

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 5 15 to <20 GPA2 5 to <7.5 GPA 6 20 to <25 GPA1. 7.5 to <10 GPA 7 25 GPA or greater
2. 10 to <15 GPA 99 Don't know
 | 5233 |
| b. What is the typical operating pressure for pre- emergence pesticide application (PSI)? | 1 <10 PSI 7 60 to <70 PSI2 10 to <20 PSI 8 70 to <80 PSI3 20 to <30 PSI 9 80 to <90 PSI4 30 to <40 PSI 10 90 to <100 PSI1. 40 to <50 PSI 11 100 PSI or greater
2. 50 to <60 PSI 99 Don't know
 | 5234 |
| c. What nozzles were typically used most often for any pre-emergence pesticide applications? (Select one) | 1. Hollow Cone 5 Air-inclusion (AI), Air-
2. Full Cone induction, Venturi
3. Disc/Core Nozzle 6 Other: specify:
4. Flat (e.g., flat fan) 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 4 15 to <20 MPH
2. 5 to <10 MPH 5 20 MPH or greater
3. 10 to <15 MPH 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 3 36 inches or greater
2. 24 to <36 inches 99 Don't know
 | 5238 |
| f. What is the target droplet size spectrum for pre-emergence pesticide applications? | 1. extremely fine or very fine 5 very coarse 404-502

(Less than 106 microns) microns1. fine 106-235 microns 6 extremely coarse (503-665
2. medium (236-340 microns) microns)
3. coarse (341-403 microns) 7 ultra coarse (Greater than

665 microns)99 Don't know | 5239 |

1. 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 5 15 to <20 GPA2 5 to <7.5 GPA 6 20 to <25 GPA1. 7.5 to <10 GPA 7 25 GPA or greater
2. 10 to <15 GPA 99 Don't know
 | 5243 |
| b. What is the typical operating pressure for post-emergence herbicide application (PSI)? | 1 <10 PSI 7 60 to <70 PSI2 10 to <20 PSI 8 70 to <80 PSI3 20 to <30 PSI 9 80 to <90 PSI4 30 to <40 PSI 10 90 to <100 PSI1. 40 to <50 PSI 11 100 PSI or greater
2. 50 to <60 PSI 99 Don't know
 | 5244 |
| c. What nozzles were typically used most often for any post-emergence herbicide applications? (Select one) | 1. Hollow Cone 5 Air-inclusion (AI), Air-
2. Full Cone induction, Venturi
3. Disc/Core Nozzle 6 Other: specify:
4. Flat (e.g., flat fan) 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 4 15 to <20 MPH
2. 5 to <10 MPH 5 20 MPH or greater
3. 10 to <15 MPH 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 3 36 inches or greater
2. 24 to <36 inches 99 Don't know
 | 5248 |
| f. What is the target droplet size spectrum for post-emergence herbicide applications? | 1. extremely fine or very fine 5 very coarse (404-502 (Less than 106 microns microns)
2. fine (106-235 microns) 6 extremly coarse (503-665
3. medium (236-340 microns) microns)
4. coarse (341-403 microns) 7 ultra coarse (Greater than

665 microns)99 Don't know | 5249 |

1. 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 5 15 to <20 GPA2 5 to <7.5 GPA 6 20 to <25 GPA1. 7.5 to <10 GPA 7 25 GPA or greater
2. 10 to <15 GPA 99 Don't know
 | 5253 |
|  | 1 <10 PSI 7 60 to <70 PSI | 5254 |
| b. What is the typical operating pressure for post-emergence insecticide/fungicide application (PSI)? | 2 10 to <20 PSI 8 70 to <80 PSI3 20 to <30 PSI 9 80 to <90 PSI4 30 to <40 PSI 10 90 to <100 PSI5 40 to <50 PSI 11 100 PSI or greater |  |
|  | 6 50 to <60 PSI 99 Don't know |  |
| c. What nozzles were typically used most often for any post-emergence insecticide/fungicide applications?(Select one) | 1. Hollow Cone 5 Air-inclusion (AI), Air-
2. Full Cone induction, Venturi
3. Disc/Core Nozzle 6 Other: specify:
4. Flat (e.g., flat fan) 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 4 15 to <20 MPH
2. 5 to <10 MPH 5 20 MPH or greater
3. 10 to <15 MPH 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 3 36 inches or greater
2. 24 to <36 inches 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 5 very coarse (404-502 (Less than 106 microns) microns)
2. fine (106-235 microns) 6 extremely coarse (503-665
3. medium (236-340 microns) microns)
4. coarse (341-403 microns) 7 ultra coarse (Greater than

665 microns)99 Don't know | 5259 |

1. 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

1. 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

5276

Other, specify: 5277

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.]

* 1. 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

* 1. Did this operation use separate spray rigs for herbicide applications?

.....................

Code

5279

Code

5280

1 Yes 3

No 99

Don't know.................................................................

1. 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

1. 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

1 0%

2 1% to 25%

3 26% - 50%

4 51% - 75%

5 76% - 100%

99 Don't know

1. For the selected field, on what proportion did this

CODE

5300

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?.........

..................................

NOTES:

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

|  |  |  |
| --- | --- | --- |
| Sources of Information | 1How 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 knowCode | 2Which 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 |

1. [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 knowCode |
| 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 |

1. For the selected field, 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. 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/ordisease-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 |

1. 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 toreduce 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

5357

Other communication methods, Specify: 5358

Other, Specify: 5359

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

|  |  |  |
| --- | --- | --- |
|  | 1 | 2 |
| 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 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 thantwo hours prior to sunset............................................. | 5534 | 5535 |
| i. Other, Specify:5536 ..... | 5537 | 5538 |

1. 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

1. 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

1. [Did respondent use farm/ranch records to report--] CODE Yes=1

0012

0011

a. [fertilizer data?]..................................................................................................................

b. [pesticide data?]................................................................................................................

SUPPLEMENTS USED

1. [Record the total number of each type of questionnaire supplement used to

complete this interview.......................................................................................................

No=3

Yes=1 No=3

Fertilizer Supplements

Pesticide Supplements

NUMBER

0042

0041

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | 9910 |  |  |  |  | 9911 |
| Reported by:  | **M** | **M** | **D** | **D** | **19** | 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-R1. Inac
2. Office Hold
 | 9901 | 1-Op/Mgr 2-Spouse3-Acct/Bkpr 4-Partner9-Other | 9902 | 1. PATI (tel)
2. PAPI (Face-to-

Face) | 9903 | 9998 | 9989 |
| **Eval.** | **Change** |
| 9900 | 9985 |