ARMS 2 - Presentations

**Introduction and Purpose** - 2

**Getting Started** - 20

**Face Page, Insert Sheet, Sec. A** - 29

**Sec. B - Field Characteristics** - 46

**Sec. C - Nutrient or Fertilizer Applications** - 63

**Sec. D - Pesticide Applications** - 103

**Sec. E - Pest Management** - 129

**Sec. F - Field Operations** - 137

**Sec. G - Irrigation** - 175

**Conclusion: Latitude & Longitude** - 189
Introduction and Purpose

Amber Elliott-Whisnant
Eastern Mountain Regional Field Office
Introduction and Purpose

• Production Practices Report
  • Potatoes

• Production Practices and Costs Report
  • Wheat
Introduction and Purpose

• Basic guidance on ARMS II
• Will not cover all scenarios
• Study manual
• Work with supervisors
• Participate in mini-schools
• Practice exercises
What is ARMS?

• Agricultural Resource Management Survey is a project conducted in cooperation with USDA’s Economic Research Service (ERS)
• Primary source of information for agricultural resource use, costs, and farm finance
• Supports key uses of enterprise, farm, and household data that correspond with mandated activities required by the U.S. Congress.
Motivation for Collecting these Data

Agricultural and Consumer Protection Act of 1973

“The Secretary of Agriculture...shall conduct a cost of production study of the wheat, feed grain, cotton, and dairy commodities under the various production practices and **establish a current national weighted average cost of production**. This study shall be updated annually and shall include all typical variable costs, including interest costs, a return on fixed costs, and a return for management.”

Mandated reporting of these data is part of permanent Farm Bill legislation.
ARMS: Data Collection Phases

• Phase I (May – July): Screens list frame operations for in-business status, operating arrangement, and presence of targeted commodities.

• Phase II: (Oct – Dec): Collects data on chemical use, production practices, and variable input costs for targeted commodities.

• Phase III: (January – April): Focuses on farm economics and risk management practices; typically includes the entire ARMS II sample and a general sample.
What is special about ARMS II?

• Two Main Versions
  • Production Practices Report (PPR – Short)
  • Production Practices and Cost Report (PPCR – Long)
• Provides Reported Data on Actual Pesticide Use
  • Crop Treated
  • Acreage Treated
  • Rates and Number of Treatments
  • Identify Alternatives Used
What is special about ARMS II?

• Provides ability to conduct economic and environmental analyses relating to:
  • Field crop chemical use,
  • Crop Production practices, and
  • Integrated Pest Management (IPM) practices and adoption levels.

• The need by data users for farm financial data corresponding with field crop chemical use, production practices, and IPM information has been increasing for a number of years.
What is special about ARMS II?

• Detailed field-level information...

• Tied to production outcomes, to commodity costs and returns, and to whole-farm finances and farm operator and household attributes

• Tied to program participation, and policies...

• With a large and nationally-representative sample of farms
EPA is the Primary User of ARMS Data

- The Water Quality Initiative
  - Data needed for assessing issue
  - Mandated development of database

- USDA Pesticide Data Program (PDP)
  - NASS & ERS responsibility
  - NASS begins chemical surveys

- Food Quality Protection Act
  - EPA mandated to review tolerance levels
  - NASS provides actual usage data
What is special about ARMS II?

• Without ARMS II Data:
  • Loss of minor uses of chemicals

• With ARMS II Data:
  • Changes in labeling and usage
    • Increased re-entry or pre-harvest intervals
    • Change protective equipment requirements
    • Reduce the use rate or number of sprays
Who Else Uses This Information?

• National and agricultural media
• Input providers
• Farmers and their advisors
• Policy stakeholders
  • Farm organizations and commodity groups
Who Else Uses This Information?

- **Policymakers**
  - Policy Decisions Will be Made with or Without ARMS
  - Some Policymakers have farm backgrounds, most don’t
  - Those that do can’t - just rely on background, experience
  - They’re all busy, so they rely on others for information
  - ARMS provides accurate data on U.S. agriculture
  - Better information makes for better decisions
Benefits to Farms

- Farmers benefit indirectly
  - Extension advisors, magazines, newspaper, radio
  - Farm org., commodity groups, agribusiness
  - Congress, USDA

- Growers chance to tell their story
- Establish facts about chemical use
- Decision-making for Product re-registration
- Impact/Consequences of cancellation
How ARMS Phase II Data are Disseminated

- ERS reports on policy-relevant topics
  - And related Amber Waves magazine articles
  - And related daily ERS Charts of Note

- Data releases on our website
  - ARMS crop production practices
  - Commodity costs and returns
  - NASS Quick Stats (chemical use)

- Staff analyses for policymakers (not public)
ARMS II/Chemical Use Background

• Target commodities rotated:
  • 2015 – Cotton, Oats, Soybeans, Wheat, Fruit
  • 2016 – Corn, Potatoes, Vegetables
  • 2017 – Cotton, Soybeans, Wheat, Fruit
  • 2018 – Soybeans, Corn, Peanuts, Vegetables
  • 2019 – Wheat, Barley, Cotton, Sorghum, Fruit
  • 2020 – Soybeans, Corn, Rice, Vegetables
  • 2021 – Corn, Rice, Cotton, Fruit
  • 2022 – Wheat, Potatoes, Vegetables

• Wheat – PPCR (Long Form)
• Potatoes – PPR (Short Form)
Additional Information

• The Phase II Interviewers Manual
• ERS website: [www.ers.usda.gov](http://www.ers.usda.gov)
• Charts of Note: read and sign up for free distribution at
• ARMS Cropping Practices Data Summary
• ERS Commodity Costs and Returns Estimates
Thanks for Watching!
Getting Started with the Survey

Lisa Prickett
Southern Plains
What Did the Operator Receive?

- Information Copy of Questionnaire
- Respondent Booklet
- Pre-Survey Letter
Introduction

• Introduce Yourself:
  • Practice your introduction to get comfortable.
  • Include who you are and whom you represent.
• Make sure you understand and can explain the purpose of the survey and why it is important.
• Want to encourage participation.
• Remind the respondent that the data are confidential and are used only to make state and national level estimates.
• Be prepared to set up an interview time.
Explaining the Process

• Get operator to agree to survey
• Explain the major sections (field selection, fertilizer, pesticides, pest management practices).
• Make sure operator has copy of form
• Encourage the use of farm records
Using Interview Time Wisely

• Verify contact information, target crop acres
• Check Screening Survey Information Form
• Work through field selection process
• Collect what you can by phone
  • Only a refusal if they give us nothing
• Determine best way to get spray records.
How Long Should This Take?

• OMB expected time to complete one questionnaire?
  • Wheat (PPCR) 65 minutes

• It is vital that both the Phase II and Phase III questionnaires be completed for these operations.

• Data from both phases provide the link between agricultural resource use and farm financial conditions.
Data Recording Reminders

- Make all entries clear and easy to read in PENCIL
- Follow Instructions regarding “NO” or “NONE”
  - Most yes/no questions now require 1 = Yes and 3 = No
  - Watch for appropriate Yes/No Check Boxes
  - Enter a dash (–) if the answer to a question is “NONE”
- Don’t Know = DK, Refused = RF
Other Data Recording Reminders

- Read instructions and questions exactly as written
- Follow the Skip Instructions
- Don’t forget Start Time and End Time!
- Make notes about answers in the margins
- Look for pre-printed decimal places
  - Acreage to one place, Chemical application to two places
- Notes about unusual situations should be complete
  - Put on Blank Page, Back Page, Comment Sheet, Other Inserts
- Please enter both yes and no responses into CAPI.
Thanks for Watching!
Face Page, ARMS I Acreage
Insert Sheet and Section A

Lisa Prickett
Southern Plains
Face Page

• Verify the name and address of the operator and any partners

• Record the starting time of the interview using military time
  • Example: 2:30 pm = 1430
  • Measures respondent burden
Burden Statement

Wheat

The information you provide will be used for statistical purposes only. Your response 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 and Statistical Efficiency Act of 2018, Title III of Pub. L. No. 115-435, codified in 44 U.S.C. Ch. 35 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 number is 0535-0218. The time required to complete this information collection is estimated to average 65 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.
Screening

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

[0004]

[MILITARY]

CHECK if verified

POID

Name:

SCREENING BOX

0006

CHECK if verified

POID

Name:
Screening

• Verify if operator is still in business
  • Including CRP
• Verify if target name grew the target crop this year
  • Including all operations
• Out of Business of Landlord only
  • Conclude interview
• Record all acres operated including
  • Cropland in other states
  • Abandoned target crop acres
• Collect data for addition individual ops or partnerships
• Take good notes
ARMS I Acreage Insert Sheet

AGRICULTURAL RESOURCE MANAGEMENT SURVEY FOR SCREENING INFORMATION FORM

STATE 99
VERSION 77
ID 999999990
TRACT 01
SUBTRACT 01
SAMPLE SEQUENCE NUMBER: 0105
OPDOM STATUS: 00

B. A. FARMER
1234 DIRT RD
ANYWHERE, ST 56789
(987) 654-3210

INFORMATION FROM SCREENING:
ARMS I Acreage Insert Sheet

INFORMATION FROM SCREENING:

TYPE OF OPERATION REPORTED: PARTNERSHIP WITH 3 PARTNERS
RESPONDENT: OPERATOR OR MANAGER

THIS OPERATION IS SELECTED FOR THE CROP: CROP – PPCR or PPR
THE SCREENING PHASE DATA ARE FROM COMPLETE RESPONSE.
DATA WERE COLLECTED BY ENUMERATOR: 99999

Sources of Data:
Operator
Spouse
Partner
Previously Reported Data

Total Acres Of Land Operated: 1,820.0
Total Acres Of Crop Land: 1,700.0

====================================================================================================
<table>
<thead>
<tr>
<th>Total Acres Of CROP Planted For 2022: 700.0</th>
</tr>
</thead>
</table>

PLEASE WRITE A NOTE TO EXPLAIN IF DATA REPORTED IN SECTION A (FIELD SELECTION SECTION), ITEM 1 FOR CROP ACRES PLANTED IS LESS THAN 525.0 OR GREATER THAN 875.0.

Sources of Data:
- Operator
- Spouse
- Partner
- Previously Reported Data
ARMS I Acreage Insert Sheet

THIS OPERATION IS SELECTED FOR THE CROP: CROP – PPCR or PPR
THE SCREENING PHASE DATA ARE FROM 7 RESPONSE.
DATA WERE COLLECTED BY ENUMERATOR: 

Total Acres Of Land Operated: UNKNOWN
Total Acres Of Crop Land: UNKNOWN

Total Acres Of CROP Planted For 2022 118.0

PLEASE WRITE A NOTE TO EXPLAIN IF DATA REPORTED IN SECTION A
(FIELD SELECTION SECTION), ITEM 1 FOR WHEAT ACRES PLANTED
IS LESS THAN 88.5 OR GREATER THAN 147.5.
Section A: Field Selection

• Targeted crop (Wheat) acres planted
  • Compare to ARMS I Acreage Insert Sheet
  • If the acres differ by +/-25%, please leave a note.

• Total number of targeted crop fields planted

• Target crop is printed on the label, and each questionnaire will only refer to that particular type of wheat as the target crop, and not all wheat.
Section A: Field Selection

• **Cardinal & Inter-Cardinal Directions**
  ➢ Direction will be on the questionnaire label and CAPI
  ➢ For each operation, the field has already been randomly selected using the eight cardinal and inter-cardinal directions
  ➢ Field selection is irrespective of the location of the homestead on the operation
Section A: Field Selection

Furthest target crop field in the given direction
Northern-most target crop field
Southern-most target crop field
Eastern-most target crop field
Western-most target crop field
Northeastern-most target crop field
Southeastern-most target crop field
Northwestern-most target crop field
Southwestern-most target crop field
Section A: Field Selection

Legend

- Targeted Crop Field

- Eastern-most
Section A: Field Selection

Legend
- Targeted Crop Field

- Northern-most
- Western-most
- Southwestern-most
- Southern-most
Section A: Field Selection

- Northern-most field?
  - no
- Northeastern-most field?
  - no
- Eastern-most field?
  - yes
  - Select field
Section A: Field Selection

Legend

- **Targeted Crop Field**

Both are Northern-most
Section A: Field Selection
Section B
Field Characteristics
For the Wheat version ONLY
The Purpose of Section B

• To obtain information used to calculate the production cost per acre

• To study conservation practices, land tenure, and the adaptation of new technologies

• The estimation of residue levels and determination of tillage systems that are used to evaluate water quality and soil erosion
Talking about the selected field

- Section B and the rest of the questionnaire only refer to the selected field.

1. How many acres of wheat did this operation plant in the selected field for the 2022 crop? ......................

   Acres
   1301
   .
Skip Instructions

- Be aware of skip instructions as questions are no longer bolded or italicized.
Landlord and Contractor

4. What was the landlord's share of the crop from the selected field?  

5. What was the total cost for all inputs provided by any landlord for the 2022 crop on the selected field? INCLUDE the costs for all inputs, such as seed, fertilizer, chemicals, technical services, custom operations, drying, and irrigation. EXCLUDE real estate tax expenses and lime costs paid by the landowner.  

6. What was the total cost for all inputs provided by any contractor for the 2022 crop on the selected field? INCLUDE the costs for all inputs, such as seed, fertilizer, chemicals, technical services, custom operations, drying, and irrigation.
Seeding Rates

• The seeding rate determines the planting cost
• This allows ERS to use adjust seed expenses from previous years using annual prices provided by NASS
Seed Treatment

- Respondent booklet has seed treatment codes

13. For the 2022 wheat crop, was the wheat seed--

1. Treated with a pesticide prior to purchase?
2. Treated with a pesticide after purchase?
3. Not treated with a pesticide?

[If item 13 = 1 or 2, continue, otherwise go to item 14.]

Seed Treatment Name

a. What was the name of the seed treatment? [Write seed treatment name in the box provided.]

b. What was the seed treatment code? [Enter the appropriate seed treatment code from the Respondent Booklet. Enter "999" if a seed treatment was applied but is not listed. Enter "-1" if the seed treatment is not known.]
Field Use

[Now I need information about the acres harvested or to be harvested and the yields from the selected field.]

17. How many acres in this wheat field were or will be--

<table>
<thead>
<tr>
<th>Unit Code</th>
<th>What yield per acre did you get or do you expect to get for wheat--</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tons</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Bushels</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Acres</th>
<th>Units per Acre</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1346</td>
<td>___</td>
<td>1348</td>
</tr>
<tr>
<td>1349</td>
<td>___</td>
<td>TONS</td>
</tr>
<tr>
<td>1431</td>
<td>___</td>
<td>1433</td>
</tr>
<tr>
<td>1351</td>
<td>___</td>
<td></td>
</tr>
<tr>
<td>1439</td>
<td>___</td>
<td></td>
</tr>
</tbody>
</table>

a. harvested for grain, first crop?

b. harvested for hay, silage, or green chop?

c. harvested for commercial seed contract?

d. abandoned?

e. used for some other purpose?
Straw Harvest

18. Was straw harvested from the selected field?

1 □ Yes – Continue  3 □ No – [go to item 20]

1520

19. How many acres of this wheat field were harvested for straw?

1521

a. How many total tons of wheat straw were harvested from these wheat acres?

\[
\frac{2.0}{\text{Tons per Acre}} \times \frac{100}{\text{Acres}} = \frac{200}{\text{Total Tons}} \quad \text{OR} \quad \frac{360}{\text{Bales}} \times \frac{1100}{\text{Lbs per Bale}} \div \frac{2000}{\text{Lbs per Ton}} = \frac{198}{\text{Total Tons}}
\]
<table>
<thead>
<tr>
<th>Season and Year</th>
<th>Crop Name</th>
<th>Crop Code</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Spring/Summer of 2022?</td>
<td>Winter Wheat</td>
<td>165</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>b. Fall of 2021?</td>
<td>Soybeans</td>
<td>165</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>c. Spring/Summer of 2021?</td>
<td>No crop</td>
<td>1470</td>
<td>1471</td>
<td>1344</td>
<td></td>
</tr>
<tr>
<td>d. Fall of 2020?</td>
<td>No crop</td>
<td>318</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Spring/Summer of 2020?</td>
<td>Winter Wheat</td>
<td>318</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>f. Fall of 2019?</td>
<td>Alfalfa</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>g. Spring/Summer of 2019?</td>
<td>Alfalfa</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>h. Fall of 2018?</td>
<td>Alfalfa</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>i. Spring/Summer of 2018?</td>
<td>Alfalfa</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>
Crop History

Example 2 - Began operating land in Spring 2021

<table>
<thead>
<tr>
<th>Season and Year</th>
<th>Crop Name</th>
<th>Crop Code</th>
<th>Was this a cover crop?</th>
<th>If a cover crop was planted, how did you terminate this cover crop?</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Spring/Summer of 2022?</td>
<td>Winter Wheat</td>
<td>1343</td>
<td>Yes=1 No=3</td>
<td>Code</td>
</tr>
<tr>
<td>b. Fall of 2021?</td>
<td>Soybeans</td>
<td>1365</td>
<td>3</td>
<td>Tilled-In</td>
</tr>
<tr>
<td>c. Spring/Summer of 2021?</td>
<td></td>
<td>1372</td>
<td>3</td>
<td>Rolled</td>
</tr>
<tr>
<td>d. Fall of 2020?</td>
<td></td>
<td>1375</td>
<td>3</td>
<td>Grazed</td>
</tr>
<tr>
<td>e. Spring/Summer of 2020?</td>
<td></td>
<td>1378</td>
<td>3</td>
<td>Harvested for grain</td>
</tr>
<tr>
<td>f. Fall of 2019?</td>
<td></td>
<td>1381</td>
<td>3</td>
<td>Winter killed</td>
</tr>
<tr>
<td>g. Spring/Summer of 2019?</td>
<td></td>
<td>1366</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>h. Fall of 2018?</td>
<td></td>
<td>1340</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>i. Spring/Summer of 2018?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Field Concerns

<table>
<thead>
<tr>
<th>Field Concerns</th>
<th>Code</th>
<th>Source 1</th>
<th>Source 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>26. In the selected field, are any of the following currently or historically a concern?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Water-driven erosion</td>
<td>2407</td>
<td>2417</td>
<td>2427</td>
</tr>
<tr>
<td>g. Other concerns</td>
<td>2413</td>
<td>2423</td>
<td>2433</td>
</tr>
<tr>
<td>i. If the answer to all of the above was &quot;Not a Concern&quot;, is it the case that there are no significant concerns on this field?</td>
<td></td>
<td></td>
<td>2414</td>
</tr>
</tbody>
</table>

[Next we will ask about soil and water concerns that you have on the selected field.]
Soil and Crop Management Table

Enumerators Note: If "99: None of the above" was selected, report code "99" in the first row (Item 1610).
Soil and Crop Management Table

The field is also included in a nutrient management plan that was first implemented in 2006 up until 2016.
Past financial assistance from the Environmental Quality Incentives Program (EQIP), but not in 2022.

Practice satisfies federal regulatory requirements.

<table>
<thead>
<tr>
<th>Practice or Activity on the Selected Field (see item 29a)</th>
<th>Code</th>
<th>Code</th>
<th>Code</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nutrient Plan</td>
<td>1610</td>
<td>20</td>
<td>1614</td>
<td>2</td>
</tr>
</tbody>
</table>

**On-field Soil and Crop Management**

- No-till/strip-till
- Conservation tillage except no-till/strip-till
- Cover crop – single species
- Cover crop mix
- Contour farming
- Conservation crop rotation
- Laser leveling

**Adjacent to Field**

- Terraces
- Grass waterway
- Implement a nutrient management plan – written plan
- Precision nutrient application
- Subsurface phosphorous application
- No fertilizer application more than 30 days before planting
- Controlled release or enhanced efficiency fertilizer
- Split nitrogen application with at least 50% applied after planting
- Drift reducing spray nozzles
- Targeted sprayer – electrical control
- Filter strip
- Field border
- Riparian buffer – grass or forest
- Irrigation water management plan
- None of the above

b. For each practice or activity checked in 29a, please complete one line of this table.

[Enumerator Note: If "99:None of the above" was selected, report code "99" in the first row (item 1610).]
30. In 2022, was the wheat in the selected field covered by a single or named peril crop insurance policy (e.g., hail, replant, wind, freeze, etc.)? 

[If item 30 = 1, continue. Otherwise, go to item 31.]

a. In 2022, was the wheat in the selected field covered by more than one single or named peril crop insurance policy (e.g., hail, replant, wind, freeze)?

b. What was the dollar amount of coverage per acre for the single peril policy covering the selected field?

c. What was the premium cost per acre for the single peril policy covering the selected field in 2022? EXCLUDE any sign-up fee.

d. What was the percent deductible for the single peril policy covering the selected field? (Record no deductible as 0%)

e. Did you (or will you) collect an indemnity payment for the selected field from the single peril policy during 2022?

31. In 2022, was the wheat in the selected field covered by a multi-peril crop insurance policy?

[If item 31 = 1 ask— Otherwise, go to Section C]

a. Which coverage did you obtain?

1. Federal CAT— basic catastrophic insurance
2. Yield Protection (YP)
3. Revenue Protection (RP)
4. Other multi-peril crop insurance
That’s All Folks!

Our big takeaways:

• Follow your skip codes- especially in the tables
• Be familiar with the terms and questionnaire before you start calling
• Take good notes
Nutrient or Fertilizer Applications

Click Here to return to Index
Section Purpose

• Identify nutrients or fertilizer used to produce the 2022 Wheat crop on the selected field.

• Fertilizer application data is used to analyze water quality and agricultural productivity issues and policies.

• Nutrient Management practices help farmers adjust fertilizer applications to crop needs and reduce costs and losses to the environment.
## Getting Started In Section C

### NUTRIENT or FERTILIZER APPLICATIONS - SELECTED FIELD

1. Were commercial nutrients or fertilizers applied to the selected field for the 2022 wheat crop? INCLUDE those from operators, landlords, and contractors.

   - [If item 1 = 1 continue. Otherwise go to item 6]

2. How many commercial nutrient or fertilizer applications were made to the selected field for the 2022 crop? INCLUDE applications made by airplanes and custom applicators.

### Code

- **Yes=1** if Applied Fertilizers
- **No=3**

### Record

- Record the number of applications

---

**Code Yes=1 if Applied Fertilizers and No=3**

**Record the number of applications**
What is Included

INCLUDE

☐ Custom applied nutrients or fertilizers

☐ Nutrients or fertilizers applied in the fall of 2021 and those applied earlier if the selected field was fallow in 2021.

☐ Commercially prepared manure or compost
What is Excluded

- Micronutrients
- Unprocessed manure
- Nutrients or fertilizers applied to previous crops in the selected field
- Lime and gypsum/landplaster
### Nutrient or Fertilizer Applications Table

#### Nitrogen Codes for Column 2

- 1 Anhydrous ammonia
- 2 Nitrogen solution (UAN)
- 3 Urea
- 4 Ammonium nitrate
- 5 Sodium nitrate
- 6 Ammonia sulfate
- 7 Potassium nitrate, magnesium nitrate, and calcium nitrate
- 8 Other nitrogen fertilizer material [specify: ]

#### 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

<table>
<thead>
<tr>
<th>LINE</th>
<th>Materials Used</th>
<th>What quantity was applied per acre?</th>
<th>[Enter material code]</th>
<th>When was this applied?</th>
<th>How was this applied?</th>
<th>How many acres in the selected field were treated in this application?</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>N: 31 P₂O₅: 32 K₂O: 33 S: 34 Type of N Used: 35</td>
<td>[Enter percentage analysis or actual pounds of plant nutrients applied per acre.] [Leave this column blank if actual nutrients were reported]</td>
<td>1 Pounds 12 Gallons 13 Quarts 19 Pounds of actual nutrients</td>
<td>1 In the fall before seeding 2 In the spring before seeding 3 At seeding 4 After seeding</td>
<td>5 In irrigation water 6 Chisel/injected or knifed in 7 Banded in or over row 8 Foliar or directed spray</td>
<td>Acres</td>
</tr>
<tr>
<td>02</td>
<td>N: 31 P₂O₅: 32 K₂O: 33 S: 34 Type of N Used: 35</td>
<td>[Enter percentage analysis or actual pounds of plant nutrients applied per acre.] [Leave this column blank if actual nutrients were reported]</td>
<td>1 Pounds 12 Gallons 13 Quarts 19 Pounds of actual nutrients</td>
<td>1 In the fall before seeding 2 In the spring before seeding 3 At seeding 4 After seeding</td>
<td>5 In irrigation water 6 Chisel/injected or knifed in 7 Banded in or over row 8 Foliar or directed spray</td>
<td>Acres</td>
</tr>
<tr>
<td>03</td>
<td>N: 31 P₂O₅: 32 K₂O: 33 S: 34 Type of N Used: 35</td>
<td>[Enter percentage analysis or actual pounds of plant nutrients applied per acre.] [Leave this column blank if actual nutrients were reported]</td>
<td>1 Pounds 12 Gallons 13 Quarts 19 Pounds of actual nutrients</td>
<td>1 In the fall before seeding 2 In the spring before seeding 3 At seeding 4 After seeding</td>
<td>5 In irrigation water 6 Chisel/injected or knifed in 7 Banded in or over row 8 Foliar or directed spray</td>
<td>Acres</td>
</tr>
</tbody>
</table>
Fertilizer is made up of 2 things:

• **Actual Nutrients**
  • N: Nitrogen
  • P: Phosphorus
  • K: Potassium
  • S: Sulfur
  • And many others

• **Carrier Material**
  • Filler - other stuff
Example Nutrients to grow a crop...

- 105 pounds of Nitrogen per acre
- 35 pounds of Phosphorus per acre
- 55 pounds of Potassium per acre
## 2 Ways to Record Nutrient or Fertilizer Applications:

- **Percent Analysis** – most common & preferred
- **Pounds of Actual Nutrients**

### Table

<table>
<thead>
<tr>
<th>LINE</th>
<th>Materials Used</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[Enter percentage analysis or actual pounds of plant nutrients applied per acre.]</td>
<td>[Enter material code]</td>
<td>[Leave this column blank if actual nutrients were reported]</td>
<td>When was this applied?</td>
<td>[Refer to code list above]</td>
<td>[How many acres in the selected field were treated in this application?]</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>P₂O₅ Phosphate</td>
<td>K₂O Potash</td>
<td>S Sulfur</td>
<td>Type of N Used</td>
<td>Acres</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01</td>
<td>31</td>
<td>32</td>
<td>33</td>
<td>34</td>
<td>35</td>
<td>36</td>
<td>37</td>
</tr>
<tr>
<td>02</td>
<td>31</td>
<td>32</td>
<td>33</td>
<td>34</td>
<td>36</td>
<td>37</td>
<td>38</td>
</tr>
<tr>
<td>03</td>
<td>31</td>
<td>32</td>
<td>33</td>
<td>34</td>
<td>35</td>
<td>36</td>
<td>37</td>
</tr>
</tbody>
</table>
2 Ways to Record Nutrient or Fertilizer Applications:

- **Percent Analysis** – most common & preferred
  - A Complete Product

- **Pounds of Actual Nutrients**
  - Individual Ingredients Of A Complete Product
2 Ways to Record Nutrient or Fertilizer Applications:

<table>
<thead>
<tr>
<th>Percent Analysis - A Complete Product</th>
<th>Pounds of Actual Nutrients - Individual Ingredients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urea 46-0-0</td>
<td>Nitrogen</td>
</tr>
<tr>
<td>10-34-0</td>
<td>Phosphorus</td>
</tr>
<tr>
<td>MAP 11-52-0</td>
<td>Potassium</td>
</tr>
<tr>
<td>DAP 18-46-0</td>
<td>Sulfur</td>
</tr>
</tbody>
</table>
It is written with numbers and dashes

• 26 - 5 - 10
  N - P - K
• First number listed is Nitrogen
• Second number listed is Phosphorus
• Third number listed is Potassium
• If a Fourth number is present: 26 - 5 - 10 - 7 that is Sulfur
Numbers represent the Percentage

• 26-5-10
• For any given quantity of this fertilizer,
  • 26% of it will be Nitrogen
  • 5% of it will be Phosphorus
  • 10% of it will be Potassium
  • The remaining 59% will be carrier material
Percent Analysis Method

• 150 Pounds of 26-5-10:
  • 150 lbs. x 26% = 39 pounds Nitrogen
  • 150 lbs. x 5% = 8 pounds of Phosphorus
  • 150 lbs. x 10% = 15 pounds of Potassium
  • The rest will be carrier material
  • 150 lbs. x 59% = 88 pounds of carrier material
Peanut M&Ms

46%

54%
Peanut M&Ms vs Urea

46% vs 54%
Snickers

18%  46%  36%
Snickers vs DAP

18%  
46%  
36%

United States Department of Agriculture  
National Agricultural Statistics Service
Sprite

- 10%
- 34%
- 56%
Sprite vs 10-34-0

10-34-0

Guaranteed Analysis
Total Nitrogen (N)........................................10%
Available Phosphate (P₂O₅)..........................34%

10%  34%  56%
Lemonade
Lemonade vs UAN 32-0-0

32% UAN SOLUTION

32%

68%
Air Freshener

Lavender Chamomile
Relaxing
- 1 cup water
- 2 tbsp. vodka or rubbing alcohol
- 10 drops lavender essential oil
- 5 drops chamomile essential oil

82%
18%
Air Freshener vs Anhydrous

82%

18%

Lavender Chamomile
Relaxing
- 1 cup water
- 2 tbsp. vodka or rubbing alcohol
- 10 drops lavender essential oil
- 5 drops chamomile essential oil

Nutrien Anhydrous Ammonia
Agricultural Grade
82-0-0

United States Department of Agriculture
National Agricultural Statistics Service
### Percent Analysis

<table>
<thead>
<tr>
<th>LINE</th>
<th>N</th>
<th>P&lt;sub&gt;2&lt;/sub&gt;O&lt;sub&gt;5&lt;/sub&gt;</th>
<th>K&lt;sub&gt;2&lt;/sub&gt;O</th>
<th>S</th>
<th>Type of N Used</th>
<th>4</th>
<th>85</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>31</td>
<td>32</td>
<td>33</td>
<td>34</td>
<td>35</td>
<td>36</td>
<td>37</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>52</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>85</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>31</td>
<td>32</td>
<td>33</td>
<td>34</td>
<td>35</td>
<td>36</td>
<td>37</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>34</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>31</td>
<td>32</td>
<td>33</td>
<td>34</td>
<td>35</td>
<td>36</td>
<td>37</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>34</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>60</td>
<td>120</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>85</td>
<td></td>
</tr>
</tbody>
</table>

---

United States Department of Agriculture
National Agricultural Statistics Service
Percent Analysis Method

• 10-34-0 11-52-0 18-46-0 28-0-0 46-0-0 82-0-0 0-0-60
• If you add the N-P-K together, it will not be greater than 85
  • If Sulfur is included in the mix, then this does not hold true.
## Pounds of Actual Nutrients

<table>
<thead>
<tr>
<th>LINE</th>
<th>N</th>
<th>P&lt;sub&gt;2&lt;/sub&gt;O&lt;sub&gt;5&lt;/sub&gt;</th>
<th>K&lt;sub&gt;2&lt;/sub&gt;O</th>
<th>S</th>
<th>Type of N Used</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>31</td>
<td>32</td>
<td>33</td>
<td>34</td>
<td>35</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>37</td>
</tr>
<tr>
<td>02</td>
<td>31</td>
<td>32</td>
<td>33</td>
<td>34</td>
<td>35</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>37</td>
</tr>
<tr>
<td>03</td>
<td>31</td>
<td>32</td>
<td>33</td>
<td>34</td>
<td>35</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>37</td>
</tr>
</tbody>
</table>
2 Ways to Record Nutrient or Fertilizer Applications:

- **Percent Analysis – most common & preferred**
  - 5 gallons of 10-34-0
  - 85 pounds of 11-52-0
  - 120 pounds of 0-0-60

- **Pounds of Actual Nutrients**
  - 10 pounds of Nitrogen
  - 44 pounds of Phosphorus
  - 72 pounds of Potassium

Complete Product

Ingredients of a Product

United States Department of Agriculture
National Agricultural Statistics Service
2 Ways to Record Nutrient or Fertilizer Applications:

- **Percent Analysis** – most common & preferred
  - 5 gallons of 10-34-0
  - 85 pounds of 11-52-0
  - 120 pounds of 0-0-60
  - Column 3 must be complete
  - Column 4 must be coded 1 or 12

- **Pounds of Actual Nutrients**
  - 10 pounds of Nitrogen
  - 44 pounds of Phosphorus
  - 72 pounds of potassium
  - Column 3 must be blank
  - Column 4 must be coded 19
## Types of Nitrogen Used

<table>
<thead>
<tr>
<th>Nitrogen Codes for Column 2</th>
<th>Materials Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Anhydrous ammonia</td>
<td>[Enter percentage analysis or actual pounds of plant nutrients applied per acre.]</td>
</tr>
<tr>
<td>2 Nitrogen solution (UAN)</td>
<td>[Show Common Nutrients or Fertilizers in Respondent Booklet]</td>
</tr>
<tr>
<td>3 Urea</td>
<td>[Refer to nitrogen list above for type of nitrogen used.]</td>
</tr>
<tr>
<td>4 Ammonium nitrate</td>
<td></td>
</tr>
<tr>
<td>5 Sodium nitrate</td>
<td></td>
</tr>
<tr>
<td>6 Ammonia sulfate</td>
<td></td>
</tr>
<tr>
<td>7 Potassium nitrate,</td>
<td></td>
</tr>
<tr>
<td>magnesium nitrate, and</td>
<td></td>
</tr>
<tr>
<td>calcium nitrate</td>
<td></td>
</tr>
</tbody>
</table>

### Table 01

<table>
<thead>
<tr>
<th>N Nitrogen</th>
<th>P₂O₅ Phosphate</th>
<th>K₂O Potash</th>
<th>S Sulfur</th>
<th>Type of N Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>31</td>
<td>32</td>
<td>33</td>
<td>34</td>
<td>35</td>
</tr>
</tbody>
</table>
Custom Application and Cost of Fertilizer

4. Were any nutrients or fertilizers applied by custom applicators?  
   - Yes = 1  
   - No = 3

   [If item 4 = 1 continue. Otherwise go to item 5.]

   a. Are you able to report the cost of nutrient or fertilizer materials and custom application separately?  
      - Yes = 1  
      - No = 3

   [If item 4a = 1 continue. Otherwise go to item 5.]

   b. Excluding the cost of the nutrient or fertilizer materials, how much was spent for custom application of nutrients or fertilizers on the selected field?

   INCLUDE
   - operator, landlord, and contractor costs
   - costs for sulfur and micronutrients
   - custom application of lime, gypsum, purchased manure and purchased compost

   EXCLUDE
   - lime, gypsum, purchased manure, and purchased compost

   Dollars & Cents per Acre OR Total Dollars

5. What was the total cost of all nutrient or fertilizer products applied to the selected field?

   INCLUDE
   - operator, landlord, and contractor costs as well as the costs for sulfur and micronutrients
   - materials applied to the selected field if it was fallow in 2021

   EXCLUDE
   - lime, gypsum, purchased manure, and purchased compost

   Dollars & Cents per Acre OR Total Dollars

[If custom applied and the cost of materials can be separated from application costs, include the cost of materials only, otherwise, include both the material and application costs.]
Custom Application and Can Separate Costs

<table>
<thead>
<tr>
<th>Code</th>
<th>0214</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0215</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. Were any nutrients or fertilizers applied by custom applicators? [Yes=1 No=3]
   [If item 4a = 1 continue. Otherwise go to item 5.]
   a. Are you able to report the cost of nutrient or fertilizer materials and custom application separately? [Yes=1 No=3]
   [If item 4a = 1 continue. Otherwise go to item 5.]
   b. Excluding the cost of the nutrient or fertilizer materials, how much was spent for custom application of nutrients or fertilizers on the selected field?

<table>
<thead>
<tr>
<th>INCL</th>
<th>CODE</th>
<th>0216</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No. 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0215</td>
<td></td>
</tr>
</tbody>
</table>

Custom Charge

Cost of Fertilizer
<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2214</td>
<td>Yes=1, No=3</td>
</tr>
<tr>
<td>2216</td>
<td>Yes=1, No=3</td>
</tr>
</tbody>
</table>

4. Were any nutrients or fertilizers applied by custom applicators? Yes/No
   (If item 4=1 continue. Otherwise go to item 5.)
   a. Are you able to report the cost of nutrient or fertilizer materials and custom application separately? Yes/No
   (If item 4a = 1 continue. Otherwise go to item 5.)
   b. Excluding the cost of the nutrient or fertilizer materials, how much was spent for custom application of nutrients or fertilizers on the selected field?

   **INCLUDE**
   - operator, landlord, and contractor costs
   - costs for sulfur and micronutrients

   **EXCLUDE**
   - custom application of lime, gypsum, purchased manure and purchased compost

5. What was the total cost of all nutrient or fertilizer products applied to the selected field?

   **INCLUDE**
   - all nutrient or fertilizer products

   **EXCLUDE**
   - lime, gypsum, purchased manure, and purchased compost

   (If custom applied and the cost of materials can be separated from application costs, include the cost of materials only, otherwise, include both the material and application costs.)

---

**Custom Application and Cannot Separate Costs**

**Custom Charge + Cost of Fertilizer**
No Custom Application
Only Cost of Fertilizer

<table>
<thead>
<tr>
<th>Code</th>
<th>Yes=1</th>
<th>No=3</th>
</tr>
</thead>
<tbody>
<tr>
<td>0214</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code</th>
<th>Office Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>0215</td>
<td></td>
</tr>
</tbody>
</table>

4. Were any nutrients or fertilizers applied by custom applicators? 
   [If item 4=1 continue. Otherwise go to item 5.]
   a. Are you able to report the cost of nutrient or fertilizer materials and custom application separately? 
   [If item 4a = 1 continue. Otherwise go to item 5.]
   b. Excluding the cost of the nutrient or fertilizer materials, how much was spent for custom application of nutrients or fertilizers on the selected field?

   **INCLUDE**
   • operator, landlord, and contractor costs
   • costs for sulfur and micronutrients

   **EXCLUDE** custom application of lime, gypsum, purchased manure and purchased compost.

   [If material and application costs can't be separated, exclude them here and record the total in item 5.]

5. What was the total cost for the selected field?

   **INCLUDE**
   • operator, landlord, and contractor costs
   • costs for sulfur and micronutrients
   • materials applied to the selected field if it was fallow in 2021

   **EXCLUDE** lime, gypsum, purchased manure, and purchased compost.

   [If custom applied and the cost of materials can be separated from application costs, include the cost of materials only, otherwise, include both the material and application costs.]
Custom Applied Fertilizer and Pesticides

Custom Charge For Fertilizer and Pesticides

Cost of Fertilizer Only
Soil Organic Matter

7. Was a soil test for soil organic matter performed on this corn field at some point in the last 10 years?

[If item 7 = 1, ask--]

a. What was the percentage of soil organic matter on the field for the most recent test?

b. How many times have you tested the selected field for soil organic matter in the last 10 years?

[If item 7b is more than 1, ask--]

c. Based on these tests, is your soil organic matter content...

To answer 7c, Item 7b must be more than 1.

Range Less than 1% up to 6%
Soil or Plant Tissue Tests

• Items 8-12
  • If tests were done
    • What was the recommendation
    • What was the cost of the tests
Nitrogen Applied

• Item 13 Decision on amount to apply
• Item 14 Nitrogen Inhibitors
  • Rate per acre
  • Cost of Inhibitor
Manure

• Acres
• Rate
• When
• Type
• Method Applied
• Source
• Any Costs for Manure or Custom Application
• Testing and Any Changes Made
Thank You!

• Be sure to follow all skips
• Answer YES=1 NO=3
Section D – Pesticide Applications

Jessica Lemenager
Northwest Region
Pesticide Applications

• Include:
  • Herbicides
  • Insecticides
  • Fungicides
  • Defoliants
  • Other Pesticides

• Exclude
  • Fertilizer Applications
  • Seed Treatments
  • Adjuvants/Surfactants
  • Applications to fence rows, ponds, canals, and ditches
Pesticide Applications

Time Frame: From the harvest of the last harvested crop until the harvest of the current crop.
Pesticide Applications

Now I have some questions about all the biocontrols or pesticides used on the selected field for the 2022 wheat 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 wheat field for the 2022 crop?

   [Probe for applications made in the fall of 2021 and those made earlier if the selected field was fallow.]

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

- Obtain the trade name and formulation
- Respondent Booklet
  - Formulation (Liquid or Dry)
  - Type or Class of each product

<table>
<thead>
<tr>
<th>Chemical Product Name</th>
<th>LINE</th>
<th>01</th>
<th>02</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td>61</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>62</td>
<td>62</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>63</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>64</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>___</td>
<td>___</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>___</td>
<td>___</td>
</tr>
</tbody>
</table>
## Pesticide Applications Table

- Verify Product with EPA Number

<table>
<thead>
<tr>
<th>L</th>
<th>H</th>
<th>Product Description</th>
<th>EPA Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>H</td>
<td>41725 GF-3335</td>
<td>62719-695</td>
</tr>
<tr>
<td>L</td>
<td>H</td>
<td>41198 GLY STAR GRASS AND WEED KILLER CONCENTRATE</td>
<td>42750-67</td>
</tr>
<tr>
<td>L</td>
<td>H</td>
<td>41508 GLY-4 PLUS HERBICIDE</td>
<td>84009-12</td>
</tr>
<tr>
<td>L</td>
<td>H</td>
<td>41067 GLYPHO 648</td>
<td>34704-929</td>
</tr>
<tr>
<td>L</td>
<td>H</td>
<td>40910 GLYPHOMAX</td>
<td>62719-323</td>
</tr>
<tr>
<td>L</td>
<td>H</td>
<td>40950 GLYPHOSATE</td>
<td>34704-866</td>
</tr>
<tr>
<td>L</td>
<td>H</td>
<td>40977 GLYPHOSATE 4 HERBICIDE</td>
<td>51036-312</td>
</tr>
<tr>
<td>L</td>
<td>H</td>
<td>41180 GLYPHOSATE 4 PLUS</td>
<td>81927-9</td>
</tr>
<tr>
<td>L</td>
<td>H</td>
<td>41023 GLYPHOSATE 41%</td>
<td>42750-60</td>
</tr>
<tr>
<td>L</td>
<td>H</td>
<td>41420 GLYPHOSATE 41% HERBICIDE</td>
<td>87659-3</td>
</tr>
<tr>
<td>L</td>
<td>H</td>
<td>41053 GLYPHOSATE 41% PLUS</td>
<td>42750-61</td>
</tr>
<tr>
<td>L</td>
<td>H</td>
<td>41011 GLYPHOSATE 53.8%</td>
<td>42750-59</td>
</tr>
<tr>
<td>L</td>
<td>H</td>
<td>41306 LEXAR EZ HERBICIDE</td>
<td>100-1414</td>
</tr>
<tr>
<td>L</td>
<td>H</td>
<td>41052 LEXAR HERBICIDE</td>
<td>100-1201</td>
</tr>
<tr>
<td>L</td>
<td>H</td>
<td>41575 LIBERTY 2,4-D ESTER 6</td>
<td>89168-5</td>
</tr>
<tr>
<td>L</td>
<td>H</td>
<td>41817 LIBERTY 280 SL HERBICIDE</td>
<td>7969-448</td>
</tr>
<tr>
<td>L</td>
<td>F</td>
<td>71085 LIBERTY AZOXY-TET</td>
<td>89168-52</td>
</tr>
<tr>
<td>L</td>
<td>H</td>
<td>11399 LIBERTY BIFENTHRIN 2 EC</td>
<td>89168-19</td>
</tr>
<tr>
<td>L</td>
<td>H</td>
<td>41356 LIBERTY CLETHODIM 2EC</td>
<td>89168-11</td>
</tr>
<tr>
<td>L</td>
<td>H</td>
<td>41386 LIBERTY GLYPHOSATE PLUS</td>
<td>89168-17</td>
</tr>
<tr>
<td>L</td>
<td>H</td>
<td>41814 LIBERTY HERBICIDE</td>
<td>7969-447</td>
</tr>
<tr>
<td>L</td>
<td>H</td>
<td>41762 LIBERTY MESOTRIONE 4SC</td>
<td>89168-54</td>
</tr>
<tr>
<td>D</td>
<td>H</td>
<td>41484 LIBERTY METRIBUZIN 75DF</td>
<td>89168-30</td>
</tr>
<tr>
<td>L</td>
<td>H</td>
<td>41479 LIFELINE HERBICIDE</td>
<td>70506-310</td>
</tr>
</tbody>
</table>
# Pesticide Applications Table

- **Product Code**
  - Found in the Respondent Booklet
  - Record each product on a separate line

<table>
<thead>
<tr>
<th>Chemical Product Name</th>
<th>LINE 01</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>61</td>
<td>62</td>
<td>63</td>
<td>64</td>
<td>65</td>
<td>73</td>
<td>74</td>
<td></td>
</tr>
<tr>
<td></td>
<td>02</td>
<td>61</td>
<td>62</td>
<td>63</td>
<td>64</td>
<td>65</td>
<td>73</td>
<td>74</td>
</tr>
</tbody>
</table>

- **Columns:**
  1. What products were applied to the selected field? (Show product codes from Respondent Booklet)
  2. Was this product bought in liquid or dry form? (Enter L or D)
  3. If this was part of a tank mix, enter line number of first product in mix.
  4. When was this applied?
     1. Before planting
     2. At planting
     3. After planting
     4. Defoliation prior to harvest
  5. How much was applied per acre per application?
  6. OR
  7. What was the total amount applied per application in the selected field?
  8. [Enter unit code]
     1. Pounds
     2. Gallons
     3. Quarts
     4. Pints
     5. Liquid Ounces
     6. Dry Ounces
     7. Grams
Pesticide Applications Table

- **Product Form**
  - Liquid or Dry
  - Key word “BOUGHT”

<table>
<thead>
<tr>
<th>Chemical Product Name</th>
<th>Line</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>01</td>
<td>61</td>
<td>62</td>
<td>63</td>
<td>64</td>
<td>65</td>
<td>73</td>
<td>74</td>
</tr>
<tr>
<td></td>
<td>02</td>
<td>61</td>
<td>62</td>
<td>63</td>
<td>64</td>
<td>65</td>
<td>73</td>
<td>74</td>
</tr>
</tbody>
</table>

- [Enter unit code]
  - 1 Pounds
  - 12 Gallons
  - 13 Quarts
  - 14 Pints
  - 15 Liquid Ounces
  - 28 Dry Ounces
  - 30 Grams
Pesticide Applications Table

- **Tank Mix**
  - Two products applied in a single application
  - Enter different products on a separate line.
  - Enter the line number of the first product in the mix for all products in the mix

<table>
<thead>
<tr>
<th>Chemical Product Name</th>
<th>Line Number</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>01</td>
<td>61</td>
<td>62</td>
<td>63</td>
<td>64</td>
<td>65</td>
<td></td>
<td>73</td>
<td></td>
</tr>
<tr>
<td></td>
<td>02</td>
<td>61</td>
<td>62</td>
<td>63</td>
<td>64</td>
<td>65</td>
<td></td>
<td>73</td>
<td></td>
</tr>
</tbody>
</table>
## Pesticide Applications Table

- **Tank Mix**
  - Two products applied in a single application
  - Enter different products on a separate line.
  - Enter the line number of the first product in the mix for all products in the mix

### Example Entry

<table>
<thead>
<tr>
<th>Chemical Product Name</th>
<th>Line Number</th>
<th>Code</th>
<th>Tank Mix</th>
<th>Application Type</th>
<th>Application Date</th>
<th>Amount Applied</th>
<th>Application Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product A</td>
<td>01</td>
<td>40745</td>
<td>L</td>
<td>1</td>
<td>1.00</td>
<td>14</td>
<td></td>
</tr>
</tbody>
</table>

---

*Note: The table above is an example of how to fill out the Pesticide Applications Table.*

---

*Source: United States Department of Agriculture, National Agricultural Statistics Service*
Pesticide Applications Table

• Tank Mix
  • Two products applied in a single application
  • Enter different products on a separate line.
  • Enter the line number of the first product in the mix for all products in the mix

<table>
<thead>
<tr>
<th>Chemical Product Name</th>
<th>Line</th>
<th>L</th>
<th>D</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>OR</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product A</td>
<td>01</td>
<td>40745</td>
<td>L</td>
<td>1</td>
<td>1</td>
<td>1.00</td>
<td>14</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>02</td>
<td>41061</td>
<td>L</td>
<td>1</td>
<td>1</td>
<td>1.50</td>
<td>14</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Pesticide Applications Table

- **When Applied**

<table>
<thead>
<tr>
<th>Chemical Product Name</th>
<th>LINE</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>L</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Product A</td>
<td>01</td>
<td>61</td>
<td>62</td>
<td>63</td>
<td>64</td>
<td>65</td>
<td>73</td>
<td>74</td>
</tr>
<tr>
<td></td>
<td></td>
<td>40745</td>
<td>L</td>
<td>1</td>
<td>1</td>
<td>1.00</td>
<td></td>
<td>14</td>
</tr>
<tr>
<td>Product B</td>
<td>02</td>
<td>61</td>
<td>62</td>
<td>63</td>
<td>64</td>
<td>65</td>
<td>73</td>
<td>74</td>
</tr>
<tr>
<td></td>
<td></td>
<td>41061</td>
<td>L</td>
<td>1</td>
<td>1</td>
<td>1.50</td>
<td></td>
<td>14</td>
</tr>
</tbody>
</table>
Pesticide Applications Table

- Application Rate
- Total amount OR amount per acre

<table>
<thead>
<tr>
<th>Chemical Product Name</th>
<th>Application Rate</th>
<th>Total amount</th>
<th>Amount per acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product A</td>
<td>40745 L</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>41061 L</td>
<td>1</td>
<td>1.50</td>
</tr>
</tbody>
</table>

**Note:**
- [Enter unit code]
  - 1: Pounds
  - 12: Gallons
  - 13: Quarts
  - 14: Pints
  - 15: Liquid Ounces
  - 28: Dry Ounces
  - 30: Grams
# Pesticide Applications Table

- **Unit Code**
  - Must match the product form

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Product A</td>
<td>01</td>
<td>40745</td>
<td>L</td>
<td>1</td>
<td>1</td>
<td>1.0</td>
<td>14</td>
<td>L</td>
</tr>
<tr>
<td>Product B</td>
<td>02</td>
<td>41061</td>
<td>L</td>
<td>1</td>
<td>1</td>
<td>1.5</td>
<td>14</td>
<td>L</td>
</tr>
</tbody>
</table>
Pesticide Applications Table

- How Applied
  Interviewer Manual gives a in-depth description of application methods.

<table>
<thead>
<tr>
<th>LINE</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>How was this product applied?</td>
<td>How many acres in the selected field were treated with this product?</td>
<td>How many times was it applied?</td>
<td>Were these applications made by---</td>
</tr>
<tr>
<td>01</td>
<td>76 1</td>
<td>77 20.0</td>
<td>79 1</td>
<td>80 1</td>
</tr>
<tr>
<td>02</td>
<td>75 1</td>
<td>77 20.0</td>
<td>79 1</td>
<td>80 1</td>
</tr>
</tbody>
</table>

**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. Chisel/injected or knitted in
7. Banded in or over row
8. Foliar or directed spray
9. Spot treatments
## Pesticide Applications Table

- Acres Treated

<table>
<thead>
<tr>
<th>Line</th>
<th>How was this product applied?</th>
<th>How many acres in the selected field were treated with this product?</th>
<th>How many times was it applied?</th>
<th>Were these applications made by---</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>76 1</td>
<td>20 0</td>
<td>1</td>
<td>Operator, partner or family member?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 Custom applicator?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3 Employee/Other?</td>
</tr>
<tr>
<td>02</td>
<td>76 1</td>
<td>20 0</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Product A**

**Product B**
Pesticide Applications Table

- Number of Applications
  - If everything else is the same (rate, who/when/how applied, etc)

<table>
<thead>
<tr>
<th>LINE</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Product A</td>
<td>76</td>
<td>1</td>
<td>77</td>
<td>20</td>
</tr>
<tr>
<td>Product B</td>
<td>76</td>
<td>1</td>
<td>77</td>
<td>20</td>
</tr>
</tbody>
</table>
## Pesticide Applications Table

- Who made applications

<table>
<thead>
<tr>
<th>LINE</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>How was this product applied?</td>
<td>How many acres in the selected field were treated with this product?</td>
<td>How many times was it applied?</td>
<td>Were these applications made by---</td>
</tr>
<tr>
<td>[Enter code from above.]</td>
<td>ACRES</td>
<td>NUMBER</td>
<td></td>
<td>1 Operator, partner or family member?</td>
</tr>
<tr>
<td>Product A</td>
<td>01</td>
<td>76</td>
<td>1</td>
<td>77</td>
</tr>
<tr>
<td>Product B</td>
<td>02</td>
<td>76</td>
<td>1</td>
<td>77</td>
</tr>
</tbody>
</table>
### Pesticide Applications Table

<table>
<thead>
<tr>
<th>Chemical Product Name</th>
<th>LINE</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Roundup Ultra</strong></td>
<td>01</td>
<td>41159</td>
<td>L</td>
<td>—</td>
<td>4</td>
<td>4.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Banvel+Atrazine</strong></td>
<td>02</td>
<td>41061</td>
<td>L</td>
<td>2</td>
<td>4</td>
<td>6.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Clarity</strong></td>
<td>03</td>
<td>40570</td>
<td>L</td>
<td>2</td>
<td>4</td>
<td>2.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Aztec 2.1</strong></td>
<td>04</td>
<td>11310</td>
<td>D</td>
<td>—</td>
<td>5</td>
<td>2.00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **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
  2. At planting
  3. After planting
  4. Defoliation prior to harvest
- **6**: How much was applied per acre per application?
- **7**: What was the total amount applied per application in the selected field?
- **8**: [Enter unit code]
  1. Pounds
  2. Gallons
  3. Quarts
  4. Pints
  5. Liquid Ounces
  6. Dry Ounces
  7. Grams
## Pesticide Applications Table

<table>
<thead>
<tr>
<th>LINE</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>76</td>
<td>3</td>
<td>50.0</td>
<td>1</td>
</tr>
<tr>
<td>02</td>
<td>76</td>
<td>8</td>
<td>50.0</td>
<td>1</td>
</tr>
<tr>
<td>03</td>
<td>76</td>
<td>8</td>
<td>50.0</td>
<td>1</td>
</tr>
<tr>
<td>04</td>
<td>76</td>
<td>1</td>
<td>50.0</td>
<td>1</td>
</tr>
</tbody>
</table>

**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. Chisel/injected or knifed in
7. Banded in or over row
8. Foliar or directed spray
9. Spot treatments

**Legend**

- Line number
- How was this product applied?
- How many acres in the selected field were treated with this product?
- How many times was it applied?
- Were these applications made by:
  1. Operator, partner or family member?
  2. Custom applicator?
  3. Employee/Other?
<table>
<thead>
<tr>
<th>Line</th>
<th>Pesticide Type (Herbicide, Insecticide, Fungicide, etc.)</th>
<th>EPA No. or Trade Name and Formulation</th>
<th>Form Purchased (Liquid or Dry)</th>
<th>Where Purchased</th>
</tr>
</thead>
<tbody>
<tr>
<td>06</td>
<td>Insecticide</td>
<td>Danitol 2.4EC, EPA #39398-17</td>
<td>Liquid</td>
<td>Midland Chem Supply</td>
</tr>
</tbody>
</table>

Some formulations (2, 3):
- A: Aerosol
- B: Bait
- D: Dust
- DF: Dry flowable
- E, EC: Emulsifiable concentrate
- FL: Flowable
- G: Granule
- M: Microencapsulated
- P: Pellet
- RTU: Ready-to-use
- SP: Soluble powder
- ULV: Ultralow-volume concentrate
- WP: Wettable powder
- WDG: Water-dispersible granule
### Pesticide Applications

3. Were any chemicals, biocontrols, or pesticides applied by custom applicators? (Yes)\(\text{No}\)

   - If yes, how much was spent for custom application of such materials on the selected field? INCLUDE operator, landlord, and contractor costs.

4. What was the total cost of all chemical, biocontrol, or pesticide products applied to the selected field? INCLUDE operator, landlord, and contractor costs, defoliants, herbicides, insecticides, fungicides, surfactants, wetting agents, growth regulators, and materials applied before planting and during 2021 fallow period. EXCLUDE seed treatments.

   - How much was spent for herbicide products applied to the selected field? INCLUDE operator, landlord, and contractor costs.
   - How much was spent for insecticide products applied to the selected field? INCLUDE operator, landlord, and contractor costs.
   - How much was spent for fungicide products applied to the selected field? INCLUDE operator, landlord, and contractor costs.

**Note:** If custom applied and the costs for materials can be separated from application costs, include the cost for materials only. Otherwise, report both the material and application costs in item 4.
Things to help...

- Supplements
- Use of farm records
- Respondent Booklet
Section D – Helpful Hints

• Restricted Use Pesticides (RUP’s) - record keeping requirements for RUP’s can help the respondent report pesticide applications.

• Please circle the pesticides that the farmer used on the specified field in a Respondent Booklet.

• Leave any marked up respondent booklets inside the questionnaire – no PII!

• IMPORTANT: We want to collect all pesticide applications through harvest.
Section D – Helpful Hints

• Do not record the spray volume applied to the field.
• Do not record the inclusion of adjuvants, etc.
• Do not record liquid fertilizer solutions applied in conjunction with a pesticide. Put this information in the fertilizer table.
• Use the conversion table in the respondent booklet, if necessary, if other units are offered
  • (2 tablespoons = 1 ounce dry).
• Unit code and formulation code must be consistent.
Thanks for Watching!!
Section E - Pest Management

Wheat

Nia Gianino
Heartland Regional Field Office
Section E: Purpose

• To provide data about pest management practices that growers use on their crops.
  • Alternative to pesticides
  • Practices which improve the effectiveness of pesticides
Section E: Pest Management

• Important to Define Pests

- WEEDS
- INSECTS
- DISEASES
- FUNGUS

In this section, “Pests” refers to all FOUR.
Section E: Pest Management

• Prevention
• Avoidance
• Monitoring
• Suppression
Filling out the Questionnaire

• Skip codes!

8. In 2022, how was the selected field primarily scouted for insects, weeds, diseases, and/or beneficial organisms?

1. By deliberately going to the field specifically for scouting activities [Enter code 1 and go to item 9.]
2. By conducting general observations while performing routine tasks [Enter code 2 and go to item 10.]
3. The selected field was not scouted. [Enter code 3 and go to item 14.]
“Specific Purpose” Questions: Intent of operator is key.

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?

a. 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?

d. Rotate crops in the selected field during the past three years?

e. Maintain ground covers, mulches, or other physical barriers?
13. Do you believe that the selected field was infested with any of the following insects?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
</table>
|   | Yes=1 No=3 | [If column 2 = 1, ask--]
|   |   | Do you believe that the infestation/population level was higher than the economic threshold for treatment? |
|   |   | 1 Much higher (over 1.5 times the threshold) |
|   |   | 2 Higher (between 1 and 1.5 times the threshold) |
|   |   | 3 Lower (between 1 and .5 times the threshold) |
|   |   | 4 Much lower (between .5 and 0 times the threshold) |
|   |   | 99 Don't Know |
| a. Aphids | 2266 | 2267 |
| b. Armyworm | 2278 | 2279 |
| c. Cereal Leaf Beetle | 2280 | 2281 |
Section E: Key Points

• Remember how we define pest for this survey
• Be careful with your skip codes
• Leave detailed notes
• If you have questions, ask them
Section F: Field Operations

Andy Cochran
Mountain Region
Overview

• Field Operations Table
• Labor
• Precision Agriculture
Field Operations Table

• Time frame
• Types of field operations
• Order/sequence
• Respondent booklet codes
1. Including custom operations, I need to list field work performed by machines on the selected field for the 2022 wheat crop. Please...
   - begin with the first field operation after harvest of the previous crop, including operations for a cover crop established since the previous crop was harvested. If fallow during 2021, list operations starting with fall 2020;
   - list the operations in order through harvest and hauling of this crop to storage or first point of sale; and
   - maintain the order of tandem hook-ups.

<table>
<thead>
<tr>
<th>Codes for Column 5</th>
<th>Office Use Lines in Table</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 You (the Operator)</td>
<td>0499</td>
</tr>
<tr>
<td>2 Partner</td>
<td></td>
</tr>
<tr>
<td>3 Unpaid Worker</td>
<td></td>
</tr>
<tr>
<td>4 Paid Part-time or Seasonal Worker</td>
<td></td>
</tr>
<tr>
<td>5 Paid Full-time Worker</td>
<td></td>
</tr>
<tr>
<td>6 Custom Applicator</td>
<td></td>
</tr>
</tbody>
</table>

Check List

INCLUDE all field work using machines for:
- Land forming/Levee Building
- Tillage
- Preparing for Irrigation
- Planting
- Fertilizer & Pesticide applications
- Harvesting & Hauling to storage or first point of sale

EXCLUDE:
- Lime & Gypsum/land plaster applications
- Compost & Non-commercial manure applications
### Line vs. Sequence

- Line numbers are administrative identifiers
- Sequence numbers are for you to fill out
  - Indicate relative order of operations
  - Begin with 1
  - Do not skip any sequence numbers

<table>
<thead>
<tr>
<th>No.</th>
<th>LINE</th>
<th>SEQUENCE</th>
<th>What operation or equipment was used?</th>
<th>[Record machine code from Respondent Booklet]</th>
<th>Who was the machine operator? [Enter code from above]</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>87</td>
<td>1</td>
<td>88</td>
<td>89</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>87</td>
<td>2</td>
<td>88</td>
<td>89</td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>87</td>
<td>3</td>
<td>88</td>
<td>89</td>
<td></td>
</tr>
<tr>
<td>04</td>
<td>87</td>
<td>4</td>
<td>88</td>
<td>89</td>
<td></td>
</tr>
<tr>
<td>05</td>
<td>87</td>
<td>5</td>
<td>88</td>
<td>89</td>
<td></td>
</tr>
<tr>
<td>06</td>
<td>87</td>
<td>6</td>
<td>88</td>
<td>89</td>
<td></td>
</tr>
<tr>
<td>07</td>
<td>87</td>
<td>7</td>
<td>88</td>
<td>89</td>
<td></td>
</tr>
</tbody>
</table>
Tandem operations

- Two or more field operations
- At the same time
- Powered by the same machine
### See a problem?

- After the correction, a sequence number is skipped
See a problem?

- After the correction, a sequence number is skipped
- Update the later sequence numbers so none is skipped
- Follow-up question: Which of these lines are **Tandem Operations**?
  - Lines 2 and 3
  - Lines 8 and 9
<table>
<thead>
<tr>
<th>No.</th>
<th>Line</th>
<th>Sequence No.</th>
<th>Activity</th>
<th>Code</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>87</td>
<td>1</td>
<td>Pesticide</td>
<td>92</td>
<td>89</td>
</tr>
<tr>
<td>02</td>
<td>87</td>
<td>2</td>
<td>Fertilized</td>
<td>72</td>
<td>89</td>
</tr>
<tr>
<td>03</td>
<td>87</td>
<td>3</td>
<td>Planted</td>
<td>113</td>
<td>89</td>
</tr>
<tr>
<td>04</td>
<td>87</td>
<td>4</td>
<td>Pesticide</td>
<td>91</td>
<td>89</td>
</tr>
<tr>
<td>05</td>
<td>87</td>
<td>5</td>
<td>Harvest</td>
<td>123</td>
<td>89</td>
</tr>
<tr>
<td>06</td>
<td>87</td>
<td>6</td>
<td>Grain Cart</td>
<td>209</td>
<td>89</td>
</tr>
<tr>
<td>07</td>
<td>87</td>
<td>7</td>
<td>Semi</td>
<td>304</td>
<td>89</td>
</tr>
</tbody>
</table>
### MACHINERY and IMPLEMENT CODES

**Section F, Item 1, Columns 3 & 4**

#### PLOWS and DISKS

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Chisel Plow (Big Ox)</td>
</tr>
<tr>
<td>02</td>
<td>Counter Plow (Counter Chisel, Soil Saver, Soil Conservator)</td>
</tr>
<tr>
<td>03</td>
<td>Deep Ripper (Knife, Bed knife, Side)</td>
</tr>
<tr>
<td>04</td>
<td>Disk Plow</td>
</tr>
<tr>
<td>05</td>
<td>Regular</td>
</tr>
<tr>
<td>06</td>
<td>Two Way</td>
</tr>
<tr>
<td>07</td>
<td>Subsoiler (Noble, Sweep, Hoeme Plow, Muckerly Plow)</td>
</tr>
<tr>
<td>08</td>
<td>Disk-chisel (Mulch Tiller)</td>
</tr>
<tr>
<td>09</td>
<td>Heavy Disk</td>
</tr>
<tr>
<td>10</td>
<td>Light Disk</td>
</tr>
<tr>
<td>11</td>
<td>One-way Disk (Disk Tiller)</td>
</tr>
<tr>
<td>12</td>
<td>Single Disk</td>
</tr>
<tr>
<td>13</td>
<td>Plowing</td>
</tr>
<tr>
<td>14</td>
<td>Regular</td>
</tr>
<tr>
<td>15</td>
<td>Paraplow</td>
</tr>
</tbody>
</table>

#### MISCELLANEOUS TILLAGE

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Land-all, Do-all, Mix-n-till, Till-all (Disk, Shovels, Reel &amp; Spikes)</td>
</tr>
<tr>
<td>02</td>
<td>Mulch Treader, Picker, Treader, Skew</td>
</tr>
<tr>
<td>03</td>
<td>Roto-tiller</td>
</tr>
<tr>
<td>04</td>
<td>Roterra (Roto-spike, Lely)</td>
</tr>
<tr>
<td>05</td>
<td>Sand-fighter</td>
</tr>
<tr>
<td>06</td>
<td>Soil Finisher (Finishing Tool, Mulch Finisher, Tr-tiller, Task Master)</td>
</tr>
<tr>
<td>07</td>
<td>Root Crown Puller</td>
</tr>
<tr>
<td>08</td>
<td>Stalk Puller/Chopper</td>
</tr>
<tr>
<td>09</td>
<td>Vertical Tiller</td>
</tr>
<tr>
<td>10</td>
<td>Strip Tiller</td>
</tr>
</tbody>
</table>

#### HARROWS (DRAGS)

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Heavy Harrow</td>
</tr>
<tr>
<td>02</td>
<td>Field Conditioner (Scratcher, Seed Bed Conditioner, Soil Conditioner, Ground Hop)</td>
</tr>
<tr>
<td>03</td>
<td>Finishing (Harrowator, Spiral, Roller, Knives, Shanks, Pegs, Smoother)</td>
</tr>
<tr>
<td>04</td>
<td>Flex-tine Tooth (Coil Tine)</td>
</tr>
<tr>
<td>05</td>
<td>Multi-weeder (Cultivator &amp; Harrow)</td>
</tr>
<tr>
<td>06</td>
<td>Rail, Pipe, Log, Plank</td>
</tr>
<tr>
<td>07</td>
<td>Rod Weeder</td>
</tr>
<tr>
<td>08</td>
<td>Roller (Cutl-mulcher, Pulvi-mulcher, Crumbler, Packer-mulcher, Packer &amp; Shanks)</td>
</tr>
<tr>
<td>09</td>
<td>Spike Tooth</td>
</tr>
<tr>
<td>10</td>
<td>Spring Tooth</td>
</tr>
<tr>
<td>11</td>
<td>Powered Spike Tooth Harrow</td>
</tr>
</tbody>
</table>

---

**United States Department of Agriculture**

**National Agricultural Statistics Service**
<table>
<thead>
<tr>
<th>LINE No.</th>
<th>SEQUENCE</th>
<th>Operation or Equipment Used</th>
<th>Code</th>
<th>Machine Code (from Respondent Booklet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td></td>
<td>Pesticide</td>
<td>92</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td></td>
<td>Fertilized</td>
<td>72</td>
<td></td>
</tr>
<tr>
<td>03</td>
<td></td>
<td>Planted</td>
<td>113</td>
<td></td>
</tr>
<tr>
<td>04</td>
<td></td>
<td>Pesticide</td>
<td>91</td>
<td></td>
</tr>
<tr>
<td>05</td>
<td></td>
<td>Harvest</td>
<td>123</td>
<td></td>
</tr>
<tr>
<td>06</td>
<td></td>
<td>Grain Cart</td>
<td>209</td>
<td></td>
</tr>
<tr>
<td>07</td>
<td></td>
<td>Semi</td>
<td>304</td>
<td></td>
</tr>
</tbody>
</table>

**BEDDERS-SHAPERS**

- Offset Disk
  - 10: Heavy Disk
  - 11: Light Disk
  - 12: One-way Disk (Disk Tiller)
  - 13: Single Disk

- Tandem Disk
  - 14: Plowing
  - 15: Regular
  - 16: Paraplow

- Roll-packers
  - 52: Attachment
  - 53: Smooth & Flat

**PACKERS**

- Cult-packers
  - 51: Pulverizer, Crow-foot, Serrated, Ring, Spiral

**FERTILIZER APPLICATORS**

- Aerial (Airplane)
- Attachment to implement
- Manure Spreader
- Self-propelled
- Truck Spreader

**TRACTOR MOUNTED**

- Anhydrous
- Dry
- Liquid

**TRAILER MOUNTED**

- Anhydrous
- Dry
- Liquid

**PLANTERS**

- Bedder-shaper Planter
- Listor-bedder
- No-till, Minimum Till, (Ripper Planter)
- Conventional, Regular (Tire, Flex)
- Air Delivery/vacuum
- Ridge till

**CULTIVATORS**

- Field Cultivators
  - Regular Digger,
  - Triple K, Danish Tined,
  - Swedish Tined,
  - Incorporated, "S-line, Cultivator,
  - Vibra-shank Harrow,
  - Lillian Tiller
- Heavy Duty (Jack Knife Cultivator)
- Marker
- Fallow Master
- Furrow-out Cultivator
- Rotary Hoe (Crust Buster)

- Row Cultivators
  - Disk Sweep, Shovel
  - Rolling, Rotary

**CULTIVATORS**

- Rod Weeder
- Roller (Culti-mulcher, Pulv-mulcher, Crumbler,
  Pack-mulcher, Pack & Shanks)
- Spike Tooth
- Spring Tooth
- Powered Spike Tooth Harrow

USDA
United States Department of Agriculture
National Agricultural Statistics Service
<table>
<thead>
<tr>
<th>No.</th>
<th>Sequence</th>
<th>Operation or Equipment</th>
<th>Code</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>87</td>
<td>Pesticide</td>
<td>92</td>
<td>89</td>
</tr>
<tr>
<td>02</td>
<td>87</td>
<td>Fertilized</td>
<td>72</td>
<td>89</td>
</tr>
<tr>
<td>03</td>
<td>87</td>
<td>Planted</td>
<td>113</td>
<td>89</td>
</tr>
<tr>
<td>04</td>
<td>87</td>
<td>Pesticide</td>
<td>91</td>
<td>89</td>
</tr>
<tr>
<td>05</td>
<td>87</td>
<td>Harvest</td>
<td>123</td>
<td>89</td>
</tr>
<tr>
<td>06</td>
<td>87</td>
<td>Grain Cart</td>
<td>209</td>
<td>89</td>
</tr>
<tr>
<td>07</td>
<td>87</td>
<td>Semi</td>
<td>304</td>
<td>89</td>
</tr>
</tbody>
</table>

**HARVESTING EQUIPMENT**

- Small Grains/Row Crops Combine
  - 121: Hillside
  - 122: Self-propelled, 2wd
  - 123: Self-propelled, 4wd
  - 124: Track
  - 125: PTO/motor Mounted
- Windrower-swather
  - 126: (Grain/hay) PTO
  - 127: (Grain/hay) self-propelled
- Hand Harvesting

- Power Take-off
- Wheel Drive

**MOWERS and BALERS**

- 141: Amish Harvester
- 145: Motor Mounted
- 146: PTO (Large)
- 147: PTO (Small)
- 148: Self-propelled
- 150: Stacker, Automatic
- 149: Mower-chopper-Rotary
- 150: Conditioner-PTO
- 151: Self-propelled
- 152: Drum disk
- 153: Flail
- 154: Sickle
- 155: Dump
- 156: Side Delivery
- 157: Wheel
- 158: Hay Tedder
- 159: Brush Rake Sweeper

**OTHER IMPLEMENTS**

- 191: Burn Buggy
- 192: Chaff/straw Saver
- 193: Electric-discharge Weed Killer
- 196: Off-field Thresher
- 198: Rock Windrower or Rake
- 199: Rodent (Gopher) Killer
- 200: Roller Groover
- 201: Rubber-tired Wood Puller
- 202: Flail Shredder
- 203: Rotary Shredder
- 204: Silage Harvester
- 205: Stalk Shredder, Stalk Cutter
- 206: Swath Roller
- 207: Tractor or Truck-No attachments
- 223: Flame Thrower
<table>
<thead>
<tr>
<th>No.</th>
<th>LINE</th>
<th>No.</th>
<th>CODE</th>
<th>LINE</th>
<th>No.</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>1</td>
<td>Pesticide</td>
<td>87</td>
<td>2</td>
<td>Fertilized</td>
<td>87</td>
</tr>
<tr>
<td>02</td>
<td>2</td>
<td>92</td>
<td></td>
<td>3</td>
<td>Planted</td>
<td>88</td>
</tr>
<tr>
<td>03</td>
<td>3</td>
<td>88</td>
<td></td>
<td>4</td>
<td>Pesticide</td>
<td>88</td>
</tr>
<tr>
<td>04</td>
<td>4</td>
<td>88</td>
<td></td>
<td>5</td>
<td>Harvest</td>
<td>88</td>
</tr>
<tr>
<td>05</td>
<td>5</td>
<td>123</td>
<td></td>
<td>6</td>
<td>Grain Cart</td>
<td>88</td>
</tr>
<tr>
<td>06</td>
<td>6</td>
<td>88</td>
<td></td>
<td>7</td>
<td>Semi</td>
<td>88</td>
</tr>
<tr>
<td>07</td>
<td>7</td>
<td>89</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Check List**

INCLUDE all field work using machines for--
- Land forming/Levee Building
- Tillage
- Preparing for Irrigation
- Planting
- Fertilizer & Pesticide applications
- Harvesting & Hauling to storage or first point of sale

EXCLUDE
- Lime & Gypsum/land plaster applications
- Compost & Non-commercial manure applications
<table>
<thead>
<tr>
<th>No.</th>
<th>LINE</th>
<th>SEQUENCE</th>
<th>Code</th>
<th>Code</th>
<th>Code</th>
<th>CODE</th>
<th>ACRES</th>
<th>HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>1</td>
<td>87</td>
<td>87</td>
<td>1</td>
<td>Pesticide</td>
<td>88</td>
<td>92</td>
<td>80</td>
</tr>
<tr>
<td>02</td>
<td>2</td>
<td>87</td>
<td>87</td>
<td>2</td>
<td>Fertilized</td>
<td>88</td>
<td>72</td>
<td>80</td>
</tr>
<tr>
<td>03</td>
<td>3</td>
<td>87</td>
<td>87</td>
<td>3</td>
<td>Planted</td>
<td>88</td>
<td>113</td>
<td>89</td>
</tr>
<tr>
<td>04</td>
<td>4</td>
<td>87</td>
<td>87</td>
<td>4</td>
<td>Pesticide</td>
<td>88</td>
<td>91</td>
<td>89</td>
</tr>
<tr>
<td>05</td>
<td>5</td>
<td>87</td>
<td>87</td>
<td>5</td>
<td>Harvest</td>
<td>88</td>
<td>123</td>
<td>89</td>
</tr>
<tr>
<td>06</td>
<td>6</td>
<td>87</td>
<td>87</td>
<td>6</td>
<td>Grain Cart</td>
<td>88</td>
<td>209</td>
<td>89</td>
</tr>
<tr>
<td>07</td>
<td>7</td>
<td>87</td>
<td>87</td>
<td>7</td>
<td>Semi</td>
<td>88</td>
<td>304</td>
<td>89</td>
</tr>
</tbody>
</table>

**Codes for Column 5**

1. You (the Operator)
2. Partner
3. Unpaid Worker
4. Paid Part-time or Seasonal Worker
5. Paid Full-time Worker
6. Custom Applicator
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Pesticide</td>
<td>92</td>
<td>80</td>
<td>90</td>
<td>120</td>
<td>91</td>
<td>1</td>
<td>92</td>
<td>93</td>
<td>94</td>
<td>95 Self-Propelled</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>Fertilized</td>
<td>72</td>
<td>80</td>
<td>90</td>
<td>35</td>
<td>91</td>
<td>1</td>
<td>92</td>
<td>93</td>
<td>94</td>
<td>95</td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>Planted</td>
<td>113</td>
<td>89</td>
<td>90</td>
<td>30</td>
<td>91</td>
<td>1</td>
<td>92</td>
<td>93</td>
<td>94</td>
<td>95</td>
<td></td>
</tr>
<tr>
<td>04</td>
<td>Pesticide</td>
<td>91</td>
<td>89</td>
<td>90</td>
<td></td>
<td>91</td>
<td></td>
<td>92</td>
<td>93</td>
<td>94</td>
<td>95</td>
<td></td>
</tr>
<tr>
<td>05</td>
<td>Harvest</td>
<td>123</td>
<td>89</td>
<td>90</td>
<td>30</td>
<td>91</td>
<td>1</td>
<td>92</td>
<td>93</td>
<td>94</td>
<td>95</td>
<td></td>
</tr>
<tr>
<td>06</td>
<td>Grain Cart</td>
<td>209</td>
<td>89</td>
<td>90</td>
<td>20</td>
<td>91</td>
<td>6</td>
<td>92</td>
<td>93</td>
<td>94</td>
<td>95</td>
<td></td>
</tr>
<tr>
<td>07</td>
<td>Semi</td>
<td>304</td>
<td>89</td>
<td>90</td>
<td></td>
<td>91</td>
<td></td>
<td>92</td>
<td>93</td>
<td>94</td>
<td>95</td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>---------------</td>
<td>-----------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>-------</td>
<td>-------</td>
<td>------</td>
<td>------</td>
<td></td>
</tr>
<tr>
<td>01</td>
<td>87</td>
<td>Pesticide</td>
<td>92</td>
<td>90</td>
<td>90</td>
<td>91</td>
<td>92</td>
<td>1</td>
<td></td>
<td>93</td>
<td>94</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>87</td>
<td>Fertilized</td>
<td>72</td>
<td>90</td>
<td>90</td>
<td>91</td>
<td>92</td>
<td></td>
<td></td>
<td>93</td>
<td>94</td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>87</td>
<td>Planted</td>
<td>113</td>
<td>90</td>
<td>90</td>
<td>91</td>
<td>92</td>
<td></td>
<td></td>
<td>93</td>
<td>94</td>
<td></td>
</tr>
<tr>
<td>04</td>
<td>87</td>
<td>Pesticide</td>
<td>91</td>
<td>90</td>
<td>90</td>
<td>91</td>
<td>92</td>
<td></td>
<td></td>
<td>93</td>
<td>94</td>
<td></td>
</tr>
<tr>
<td>05</td>
<td>87</td>
<td>Harvest</td>
<td>123</td>
<td>90</td>
<td>90</td>
<td>91</td>
<td>92</td>
<td></td>
<td></td>
<td>93</td>
<td>94</td>
<td></td>
</tr>
<tr>
<td>06</td>
<td>87</td>
<td>Grain Cart</td>
<td>209</td>
<td>90</td>
<td>90</td>
<td>91</td>
<td>92</td>
<td></td>
<td></td>
<td>93</td>
<td>94</td>
<td></td>
</tr>
<tr>
<td>07</td>
<td>87</td>
<td>Semi</td>
<td>304</td>
<td>90</td>
<td>90</td>
<td>91</td>
<td>92</td>
<td></td>
<td></td>
<td>93</td>
<td>94</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
- If Column 5 = Code 6, skip columns 6 thru 11.
- Exclue land forming and hauling operations.
- How many total hours were spent on land forming and hauling? [Example: backhoes, disk, border maker, ditcher, rear mounted blade, trucks, wagons, forklift etc.]
- What power source was used? Tractors 1<40 HP 2 40-99 HP 3 100-149 HP 4 150-199 HP 5 >=200 HP OR 66 Animal Drawn 77 Pick up 99 Self-Propelled.
<table>
<thead>
<tr>
<th>LAND FORMING EQUIPMENT</th>
<th>HAULING EQUIPMENT</th>
<th>Enumerator Note: For land forming equipment codes 171 – 184, enter total hours operated in column 9.</th>
<th>Enumerator Note: For hauling equipment codes above, enter total hours operated in column 9.</th>
</tr>
</thead>
</table>

8 OR 9

**How many acres were covered?**

**How many total hours were spent on land forming and hauling?**

[Example backhoes, disk border maker, ditches, rear mounted blades, trucks, wagons, forklift etc.]

**What power source was used?**

**Tractors**

1 <40 HP
2 40-99 HP
3 100-149 HP
4 150-199 HP
5 ≥200 HP
OR 66 Animal Drawn
77 Pick up
99 Self-Propelled

<table>
<thead>
<tr>
<th>Acres</th>
<th>Hours</th>
<th>Code</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>92</td>
<td>93</td>
<td>94</td>
<td>95</td>
</tr>
<tr>
<td>120</td>
<td>35</td>
<td>30</td>
<td>20</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>-----</td>
</tr>
<tr>
<td>01</td>
</tr>
<tr>
<td>02</td>
</tr>
<tr>
<td>03</td>
</tr>
<tr>
<td>04</td>
</tr>
<tr>
<td>05</td>
</tr>
<tr>
<td>06</td>
</tr>
<tr>
<td>07</td>
</tr>
</tbody>
</table>

[If Column 5 = code 6, skip columns 6 thru 11]

8 | How many acres were covered? (EXCLUDE land forming and hauling operations.)
9 | How many total hours were spent on land forming and hauling? (Example: backhoes, disk, border mkr, ditches, reaper, mounted blade, tractors, wagons, forklift etc.)
10 | What power source was used? (Tractors: 1 <40 HP, 2 40-99 HP, 3 100-149 HP, 4 150-199 HP, 5 >=200 HP, OR 66 Animal Drawn, 77 Pick up, 99 Self-Propelled)
11 | What was the fuel type of the tractor? (Record fuel type only if Column 10 equals 1-5)
<table>
<thead>
<tr>
<th>No.</th>
<th>Sequence</th>
<th>Operation/Equipment</th>
<th>Code</th>
<th>Unit Code</th>
<th>Size or Swath</th>
<th>Acres</th>
<th>Hours</th>
<th>Power Source</th>
<th>Fuel Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>87</td>
<td>Pesticide</td>
<td>92</td>
<td>4</td>
<td>120</td>
<td>160.0</td>
<td>3</td>
<td>Tractors</td>
<td>1</td>
</tr>
<tr>
<td>02</td>
<td>87</td>
<td>Fertilized</td>
<td>72</td>
<td>4</td>
<td>35</td>
<td>160.0</td>
<td>3</td>
<td>Tractors</td>
<td>1</td>
</tr>
<tr>
<td>03</td>
<td>87</td>
<td>Planted</td>
<td>113</td>
<td>1</td>
<td>30</td>
<td>160.0</td>
<td>4</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>04</td>
<td>87</td>
<td>Pesticide</td>
<td>91</td>
<td>6</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>1</td>
<td>--</td>
</tr>
<tr>
<td>05</td>
<td>87</td>
<td>Harvest</td>
<td>123</td>
<td>1</td>
<td>30</td>
<td>160.0</td>
<td>99</td>
<td>1</td>
<td>--</td>
</tr>
<tr>
<td>06</td>
<td>87</td>
<td>Grain Cart</td>
<td>209</td>
<td>4</td>
<td>20</td>
<td>--</td>
<td>11</td>
<td>1</td>
<td>--</td>
</tr>
<tr>
<td>07</td>
<td>87</td>
<td>Semi</td>
<td>304</td>
<td>6</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>1</td>
<td>--</td>
</tr>
</tbody>
</table>

**CHEMICAL APPLICATIONS**
- 91 Aerial (Airplane)
- 92 Attachment to implement
- 93 Largest Self propelled (or Large Truck)
- 94 Motorcycle/atv Sprayer
- 95 Small Self-propelled (Spray-coupe, Hi-cycle)
- 96 Small Truck (Skid Mounted)
- 97 Tractor Mounted
- 98 Trailer Mounted
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>87</td>
<td>90</td>
<td>91</td>
<td>92</td>
<td>93</td>
<td>94</td>
<td>95</td>
<td>96</td>
<td>97</td>
</tr>
<tr>
<td>02</td>
<td>87</td>
<td>90</td>
<td>91</td>
<td>92</td>
<td>93</td>
<td>94</td>
<td>95</td>
<td>96</td>
<td>97</td>
</tr>
<tr>
<td>03</td>
<td>87</td>
<td>90</td>
<td>91</td>
<td>92</td>
<td>93</td>
<td>94</td>
<td>95</td>
<td>96</td>
<td>97</td>
</tr>
<tr>
<td>04</td>
<td>87</td>
<td>90</td>
<td>91</td>
<td>92</td>
<td>93</td>
<td>94</td>
<td>95</td>
<td>96</td>
<td>97</td>
</tr>
<tr>
<td>05</td>
<td>87</td>
<td>90</td>
<td>91</td>
<td>92</td>
<td>93</td>
<td>94</td>
<td>95</td>
<td>96</td>
<td>97</td>
</tr>
<tr>
<td>06</td>
<td>87</td>
<td>90</td>
<td>91</td>
<td>92</td>
<td>93</td>
<td>94</td>
<td>95</td>
<td>96</td>
<td>97</td>
</tr>
<tr>
<td>07</td>
<td>87</td>
<td>90</td>
<td>91</td>
<td>92</td>
<td>93</td>
<td>94</td>
<td>95</td>
<td>96</td>
<td>97</td>
</tr>
</tbody>
</table>

**CHEMICAL APPLICATIONS**

91 Aerial (Airplane)
92 Attachment to implement
93 Largest Self propelled
(or Large Truck)
94 Motorcycle/atv Sprayer
95 Small Self-propelled
(Spray-coupe, Hi-cycle)
96 Small Truck (Skid Mounted)
97 Tractor Mounted
98 Trailer Mounted
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>87</td>
<td>1</td>
<td>88</td>
<td>92</td>
<td>80</td>
<td>4</td>
<td>90</td>
<td>120</td>
</tr>
<tr>
<td>02</td>
<td>87</td>
<td>2</td>
<td>88</td>
<td>4</td>
<td>80</td>
<td>4</td>
<td>90</td>
<td>120</td>
</tr>
<tr>
<td>03</td>
<td>87</td>
<td>3</td>
<td>88</td>
<td>115</td>
<td>89</td>
<td>1</td>
<td>90</td>
<td>30</td>
</tr>
<tr>
<td>04</td>
<td>87</td>
<td>3</td>
<td>88</td>
<td>78</td>
<td>89</td>
<td>1</td>
<td>90</td>
<td>30</td>
</tr>
<tr>
<td>05</td>
<td>87</td>
<td></td>
<td>88</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>06</td>
<td>87</td>
<td></td>
<td>88</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>07</td>
<td>87</td>
<td></td>
<td>88</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Example:** Planting and Fertilizing are done in Tandem
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>87</td>
<td>Sprayed P</td>
<td>92</td>
<td>80</td>
<td>90</td>
<td>91</td>
<td>92</td>
<td>160.0</td>
<td>93</td>
</tr>
<tr>
<td>02</td>
<td>87</td>
<td>Disc Plow</td>
<td>4</td>
<td>80</td>
<td>90</td>
<td>91</td>
<td>92</td>
<td>160.0</td>
<td>93</td>
</tr>
<tr>
<td>03</td>
<td>87</td>
<td>Planted</td>
<td>115</td>
<td>89</td>
<td>90</td>
<td>91</td>
<td>92</td>
<td>160.0</td>
<td>93</td>
</tr>
<tr>
<td>04</td>
<td>87</td>
<td>Fertilized</td>
<td>78</td>
<td>89</td>
<td>90</td>
<td>91</td>
<td>92</td>
<td>160.0</td>
<td>93</td>
</tr>
<tr>
<td>05</td>
<td>87</td>
<td>Harvest</td>
<td>123</td>
<td>89</td>
<td>90</td>
<td>91</td>
<td>92</td>
<td>160.0</td>
<td>93</td>
</tr>
<tr>
<td>06</td>
<td>87</td>
<td>Grain Cart</td>
<td>209</td>
<td>89</td>
<td>90</td>
<td>91</td>
<td>92</td>
<td>160.0</td>
<td>93</td>
</tr>
</tbody>
</table>

Example: Grain Cart attached to Combine Harvester in Tandem
<table>
<thead>
<tr>
<th>Line</th>
<th>No.</th>
<th>Sequence</th>
<th>Operation</th>
<th>Code</th>
<th>Unit Code</th>
<th>Size or Swath</th>
<th>Code</th>
<th>60 Acres Covered</th>
<th>Code</th>
<th>Hours</th>
<th>Code</th>
<th>Fuel Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>87</td>
<td>1</td>
<td>Sprayed P</td>
<td>92</td>
<td>4</td>
<td>120</td>
<td>1</td>
<td>160.0</td>
<td>3</td>
<td>99</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>02</td>
<td>87</td>
<td>2</td>
<td>Disc Plow</td>
<td>4</td>
<td>4</td>
<td>120</td>
<td>1</td>
<td>160.0</td>
<td>3</td>
<td>94</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>03</td>
<td>87</td>
<td>3</td>
<td>Planted</td>
<td>115</td>
<td>1</td>
<td>30</td>
<td>1</td>
<td>160.0</td>
<td>4</td>
<td>94</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>04</td>
<td>87</td>
<td>3</td>
<td>Fertilized</td>
<td>78</td>
<td>1</td>
<td></td>
<td>1</td>
<td></td>
<td>94</td>
<td></td>
<td>95</td>
<td>1</td>
</tr>
<tr>
<td>05</td>
<td>87</td>
<td>4</td>
<td>Harvest</td>
<td>123</td>
<td>1</td>
<td>30</td>
<td>1</td>
<td>160.0</td>
<td>94</td>
<td>99</td>
<td>95</td>
<td>1</td>
</tr>
<tr>
<td>06</td>
<td>87</td>
<td>5</td>
<td>Grain Cart</td>
<td>209</td>
<td>4</td>
<td>20</td>
<td>6</td>
<td>160.0</td>
<td>11</td>
<td>5</td>
<td>95</td>
<td>1</td>
</tr>
<tr>
<td>07</td>
<td>87</td>
<td>6</td>
<td>Semi</td>
<td>304</td>
<td>6</td>
<td></td>
<td>1</td>
<td></td>
<td>94</td>
<td></td>
<td>95</td>
<td>1</td>
</tr>
<tr>
<td>No.</td>
<td>LINE SEQUENCE</td>
<td>Code</td>
<td>Code</td>
<td>Acres</td>
<td>Hours</td>
<td>Code</td>
<td>Code</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>---------------</td>
<td>------</td>
<td>------</td>
<td>-------</td>
<td>-------</td>
<td>------</td>
<td>------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>01</td>
<td>1</td>
<td>87</td>
<td>1</td>
<td>115</td>
<td>90</td>
<td>91</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>2</td>
<td>87</td>
<td>1</td>
<td>115</td>
<td>90</td>
<td>91</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>3</td>
<td>87</td>
<td>1</td>
<td>115</td>
<td>90</td>
<td>91</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>04</td>
<td>4</td>
<td>87</td>
<td>1</td>
<td>115</td>
<td>90</td>
<td>91</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>05</td>
<td>5</td>
<td>87</td>
<td>1</td>
<td>115</td>
<td>90</td>
<td>91</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>06</td>
<td>6</td>
<td>87</td>
<td>1</td>
<td>115</td>
<td>90</td>
<td>91</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>07</td>
<td>7</td>
<td>87</td>
<td>1</td>
<td>115</td>
<td>90</td>
<td>91</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Example**: Two planters each simultaneously planted half of a 600 acre field.
Labor and Services

• Hours spent on various activities
• Wages
• Custom work expense
• Technical or consultant services
2. Now I need some additional information about your labor. Please report the paid and unpaid labor that worked on the selected field to produce the 2022 wheat crop. EXCLUDE labor that was reported for field work performed by machines.

<table>
<thead>
<tr>
<th>Type of Workers</th>
<th>1. scouting for weeds, insects and diseases?</th>
<th>2. irrigating?</th>
<th>3. performing other work by hand?</th>
</tr>
</thead>
<tbody>
<tr>
<td>You (the operator)</td>
<td>1101</td>
<td>1102</td>
<td>1103</td>
</tr>
<tr>
<td>Partner(s)</td>
<td>1104</td>
<td>1105</td>
<td>1106</td>
</tr>
<tr>
<td>Unpaid workers</td>
<td>1107</td>
<td>1108</td>
<td>1109</td>
</tr>
<tr>
<td>Paid part-time or seasonal workers</td>
<td>1110</td>
<td>1111</td>
<td>1112</td>
</tr>
<tr>
<td>EXCLUDE custom and contract labor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paid full-time workers</td>
<td>1113</td>
<td>1114</td>
<td>1115</td>
</tr>
<tr>
<td>EXCLUDE custom and contract labor</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3. What was the average hourly wage rate paid to part-time or seasonal hired workers on the selected field? Part-time workers are defined as those who worked for wages or salaries for less than 30 hours a week on average. EXCLUDE custom and contract workers, payroll taxes and benefits.

<table>
<thead>
<tr>
<th>Dollars &amp; Cents Per Hour</th>
<th>Total Dollars per Week</th>
<th>AND</th>
<th>Number of Hours Worked Each Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>1119</td>
<td>2119</td>
<td></td>
<td>3119</td>
</tr>
</tbody>
</table>

4. What was the average hourly wage rate paid to full-time hired workers on the selected field? EXCLUDE custom and contract workers, payroll taxes and benefits.

<table>
<thead>
<tr>
<th>Dollars &amp; Cents Per Hour</th>
<th>Total Dollars per Week</th>
<th>AND</th>
<th>Number of Hours Worked Each Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>1118</td>
<td>2118</td>
<td></td>
<td>3118</td>
</tr>
</tbody>
</table>

5. Was any contract labor used on the selected field?

   [If item 5 = 1, continue. Otherwise go to item 6.]

   a. What was the average cost per acre for this contract labor? INCLUDE operator, landlord, and contractor costs.

<table>
<thead>
<tr>
<th>Dollars &amp; Cents Per Acre</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1117</td>
<td>1120</td>
</tr>
</tbody>
</table>

6. What percent of the total number of unpaid hours worked on the selected field was performed by workers under 16 years of age? Estimates of labor costs for unpaid workers are based on off-farm wage rates, which are different for workers under 16 relative to those 16 and older.
7. Now I need some information on how much was spent or will be spent for custom services used on the selected field for the 2022 wheat crop.

<table>
<thead>
<tr>
<th>1</th>
<th>Custom Service</th>
<th>2</th>
<th>Including operator, landlord, and contractor costs, how much was spent for [column1] on the selected field for the 2022 wheat crop?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Dollars &amp; Cents per Acre</td>
</tr>
<tr>
<td>a.</td>
<td>Custom land preparation, shaping and/or leveling?</td>
<td>1121</td>
<td>.___</td>
</tr>
<tr>
<td>b.</td>
<td>Custom cultivating?</td>
<td>1122</td>
<td>.___</td>
</tr>
<tr>
<td>c.</td>
<td>Custom planting and/or reseeding?</td>
<td>1123</td>
<td>.___</td>
</tr>
<tr>
<td>d.</td>
<td>Custom harvesting?</td>
<td>1124</td>
<td>.___</td>
</tr>
<tr>
<td>e.</td>
<td>Custom hauling to storage or point of first sale?</td>
<td>1126</td>
<td>.___</td>
</tr>
<tr>
<td>f.</td>
<td>Custom harvesting and hauling from field to storage or point of first sale?</td>
<td>1127</td>
<td>.___</td>
</tr>
<tr>
<td>g.</td>
<td>Custom raking, baling, and hauling the straw from the selected field?</td>
<td>1128</td>
<td>.___</td>
</tr>
</tbody>
</table>

[Check box for each service performed; refer to item 1 if necessary.]
8. Was the wheat harvested and hauled from the selected field dried (or will be dried) before it was sold or stored?

Yes=1  No=3

9. Did you hire any technical or consultant services to make recommendations such as for nutrient, pest control, irrigation, or precision farming for the selected field?

Yes=1  No=3

[If item 9 = 1, continue. Otherwise, go to item 12.]

10. Which of the following technical or consultant services did you obtain to make recommendations for the selected field?

a. Nutrient recommendations/management service?

Yes=1  No=3

b. Soil or tissue sample collection?

Yes=1  No=3
c. Pest control recommendations/management service?

Yes=1  No=3
d. Pest scouting?

Yes=1  No=3
e. Irrigation management service (i.e. irrigation scheduling)?

Yes=1  No=3

f. Yield map or remote sensing map development/interpretation?

Yes=1  No=3
g. Other custom or technical service? [Specify: __________________________]

Yes=1  No=3

[If any item in 10a–g = 1, continue. Otherwise go to item 12.]
11. What was the cost for any technical or consultant services reported in item 10, on previous page. INCLUDE operator, landlord, and contractor costs. EXCLUDE cost of soil or tissue tests or scouting costs previously reported. Do not report costs for any of these services reported above if they were previously reported as part of the cost of materials and/or application.

Dollars & Cents per Acre OR Total Dollars

1136 __ __

1137

12. Please report how any data from the selected field in 2022 will be stored and accessed.

a. Did you access the data collected from the selected field on a --
   
   i. Paper hard copy?
   
   Yes=1
   No=3
   
   ii. Personal computer?
   
   Yes=1
   No=3
   
   iii. Mobile device?
   
   Yes=1
   No=3

b. Did you access the data collected from the selected field through an agricultural technology provider website?

   Yes=1
   No=3

[If item 12b = 1, continue. Otherwise, go to item 13.]

c. Did you opt out of allowing your agricultural technology provider website to share data collected from the selected field with any third party?

   Yes=1
   No=3

d. Did you share any of the data collected from the selected field with a third party through an agricultural technology provider website?

   Yes=1
   No=3

13. Were there or will there be any data collection tools such as yield monitors, GPS mapping, etc. used during field operations on this wheat field?
13. Were there or will there be any data collection tools such as yield monitors, GPS mapping, etc. used during field operations on this wheat field?  

Yes=1  No=3  2460

[If item 13 = 1, continue. Otherwise go to item 17.]

<table>
<thead>
<tr>
<th>Data Collection Tool</th>
<th>2 Tool Used</th>
<th>3 Collected GPS coordinates</th>
<th>4 Data was/will be used to create a map</th>
<th>5 Replacement Cost Total Dollars</th>
<th>6 Annual Fee Total dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Yield monitor</td>
<td>2461 1</td>
<td>2462</td>
<td>2463</td>
<td>2570</td>
<td>2571</td>
</tr>
<tr>
<td>b. Soil tests on core sample performed on-farm or sent out to a laboratory</td>
<td>2464 3</td>
<td>2465</td>
<td>2466</td>
<td>2572</td>
<td>2573</td>
</tr>
<tr>
<td>c. Soil sensor tests</td>
<td>2467</td>
<td>2468</td>
<td>2469</td>
<td>2574</td>
<td>2575</td>
</tr>
<tr>
<td>d. Hard-wired crop condition sensors</td>
<td>2470</td>
<td>2471</td>
<td>2472</td>
<td>2576</td>
<td>2577</td>
</tr>
<tr>
<td>e. Wireless crop condition sensors</td>
<td>2473</td>
<td>2474</td>
<td>2475</td>
<td>2578</td>
<td>2579</td>
</tr>
<tr>
<td>f. Aircraft or satellites</td>
<td>2479 xxxx</td>
<td>2480</td>
<td>2481</td>
<td>2582</td>
<td>2583</td>
</tr>
<tr>
<td>g. Drones or Unmanned Aerial Vehicles (UAV)</td>
<td>2479 xxxx</td>
<td>2480</td>
<td>2481</td>
<td>2582</td>
<td>2583</td>
</tr>
<tr>
<td>h. Custom service applications – data from completed work on your field</td>
<td>2482</td>
<td>2483</td>
<td>2484</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. Public data downloaded from online sources</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[If item 13a column 2 = 1, continue. Otherwise go to item 16.]
14. Did you use the yield monitor information to--
   a. add/improve tile drainage? ................................................................. Yes=1
                                                No=3
                                               1141
   b. negotiate new crop leases? ............................................................... Yes=1
                                                No=3
                                               1144
   c. help determine chemical input use? .................................................. Yes=1
                                                No=3
                                               1143

[If any item 13 column 2 = 1, continue. Otherwise go to item 16.]

15. Using data collected from the previous tools table in item 13, did you obtain crop management recommendations, such as data interpretation, in 2022 for the selected field from any of the following--
   a. input dealers without other fee–for–services? ........................................ Yes=1
                                                No=3
                                               2491
   b. input dealers with other fee–for–services? .......................................... Yes=1
                                                No=3
                                               2492
   c. custom service providers? ........................................................................ Yes=1
                                                No=3
                                               2493
   d. USDA/university extension services? ..................................................... Yes=1
                                                No=3
                                               2494

[If any item 15a–d = 1, ask–]
   e. What was the cost for all of these services? INCLUDE operator, landlord and contractor costs. EXCLUDE costs for any of these services if they were previously reported as part of the costs of materials and/or application...........................................

Dollars & Cents per Acre OR Total Dollars

3150 .

3151
18. In the selected field, did you use the UAV for any of the following purposes?

- a. Weed analysis? Yes=1 No=3 3181
- b. Spraying herbicide or fungicide? Yes=1 No=3 3162
- c. Insect analysis? Yes=1 No=3 3183
- d. Insect control? Yes=1 No=3 3184
- e. Yield analysis? Yes=1 No=3 3185
- f. Moisture analysis? Yes=1 No=3 3186
- g. Equipment check? Yes=1 No=3 3187
17. Was any of the following GPS-enabled (Global Positioning System) equipment used to produce wheat on the selected field in 2022?
   a. Mounted in-cab heads-up displays? .................................................................................
      Yes=1  
      No=3  
      2155
   b. Smart phones or computer tablets? .................................................................................. 
      Yes=1  
      No=3  
      2156
   c. Automatic section control, such as auto sprayer boom controls or automatic section shut offs? .................................................................
      Yes=1  
      No=3  
      2166

18. If any GPS-enabled equipment was used, what was the cost to purchase and install all GPS-enabled equipment, not including guidance auto-steering equipment? INCLUDE cost for GPS receiver and annual GPS subscription fee, and operator, landlord, and contractor costs. EXCLUDE costs for any of this equipment if they were previously reported as part of the costs of materials and/or application. .................................................................
    Dollars & Cents per Acre  OR  Total Dollars
    2166
    2167
19. Was any guidance auto-steering equipment, excluding Light Bar, used on the selected field? 

   [If item 19 = 1 continue, otherwise go to item 20.]

   a. Was the guidance auto-steering equipment?
      
      1 New, owned?
      2 Used, owned?
      3 Leased?

   b. What year was guidance auto-steering equipment first purchased?

   c. What is the replacement cost for guidance auto-steering equipment?

   d. What is the annual fee for guidance auto-steering?
20. Was a variable rate applicator used on the selected field? [Yes=1 No=3] 2164

[If item 20 = 1 continue, otherwise go to Section G]

Please report the variable rate applicator types you used on the selected field to produce this crop. If a particular row's variable rate applicator was not used, leave that row blank.

<table>
<thead>
<tr>
<th>1. Was a variable rate applicator used on the selected field for--</th>
<th>2. Tool Used</th>
<th>3. Was this applicator?</th>
<th>4. Was this applicator?</th>
<th>5. What year was the applicator first used?</th>
<th>6. Premium paid for the applicator</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1 Sensor-based</td>
<td>2 GPS-based</td>
<td>3 Both</td>
<td>4 Neither</td>
</tr>
<tr>
<td></td>
<td>Yes=1</td>
<td>Code</td>
<td>Code</td>
<td>Yes=1</td>
<td>Code</td>
</tr>
<tr>
<td></td>
<td>No=3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. seeding</td>
<td>1158</td>
<td>2170</td>
<td>2171</td>
<td>2172</td>
<td>2173</td>
</tr>
<tr>
<td>b. fertilizer/lime applications</td>
<td>1152</td>
<td>2174</td>
<td>2175</td>
<td>2176</td>
<td>2177</td>
</tr>
<tr>
<td>c. pesticide applications</td>
<td>1159</td>
<td>2178</td>
<td>2179</td>
<td>2180</td>
<td>2181</td>
</tr>
<tr>
<td>d. irrigation applications</td>
<td>1197</td>
<td>2182</td>
<td>2183</td>
<td>2184</td>
<td>2185</td>
</tr>
</tbody>
</table>
Closing Remarks
Section G: Irrigation

Andy Cochran
Mountain Region
Key Topics

• For the SELECTED FIELD
• Irrigation System Type Codes
  • Use respondent booklet
• [Follow skip instructions]
Irrigation Profile

• Wheat in United States:
  • Only about 8% of wheat is irrigated (92% is dryland)
  • What irrigation systems do you see in your area?
1. How many acres in the selected field were irrigated for the 2022 wheat crop? ................................................................. 1160
   [If none, go to Conclusion]

2. Now I have some questions about the irrigation systems and water used on the selected field for the 2022 wheat crop.

   a. What type(s) of irrigation system(s) was (or were) used to irrigate the selected field?
   [Show System Type Codes in the Respondent Booklet. Enter System Type Code for the system covering the most field acres.]

       | Unit            | System | Code |
       |-----------------|--------|------|
       | System Type Code| 1161   |      |
       | Inches per Acre | 1162   |      |
       | OR              |        |      |
       | Total Acre Feet | 1163   |      |

   b. What was the total quantity of water applied to the selected field during the entire growing season? INCLUDE all water used from both on-farm and off-farm sources.

   [If operator cannot provide item 2b, ask (i) and (ii). Otherwise go to 2c]
<table>
<thead>
<tr>
<th>PRESSURE SYSTEMS</th>
<th>GRAVITY SYSTEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  HAND-MOVE</td>
<td>10 SIPHON TUBE from unlined ditches</td>
</tr>
<tr>
<td>2  SOLID or PERMANENT SET</td>
<td>11 SIPHON TUBE from lined ditches</td>
</tr>
<tr>
<td>3  SIDE ROLL or WHEEL LINE</td>
<td>12 PORTAL SYSTEM from unlined ditches</td>
</tr>
<tr>
<td>4  CENTER PIVOT or LINEAR MOVE&lt;br&gt;with sprinklers on main line</td>
<td>13 PORTAL SYSTEM from lined ditches</td>
</tr>
<tr>
<td>5  CENTER PIVOT or LINEAR MOVE&lt;br&gt;with sprinklers below main line, but more than 2 feet above ground</td>
<td>14 ANY POLY PIPE SYSTEM</td>
</tr>
<tr>
<td>6  CENTER PIVOT or LINEAR MOVE&lt;br&gt;with sprinklers less than 2 feet above ground</td>
<td>15 GATED PIPE (not poly pipe)</td>
</tr>
<tr>
<td>7  BIG GUN</td>
<td>16 IMPROVED GATED PIPE (surge flow or cablegation not poly pipe)</td>
</tr>
<tr>
<td>8  LOW FLOW IRRIGATION (drip, trickle or micro sprinkler)</td>
<td>17 SUBIRRIGATION</td>
</tr>
<tr>
<td>9  OTHER - SPECIFY</td>
<td>18 OPEN DISCHARGE FROM WELL or PUMP</td>
</tr>
<tr>
<td></td>
<td>19 OTHER - SPECIFY</td>
</tr>
</tbody>
</table>
1. How many acres in the selected field were irrigated for the 2022 wheat crop?  
   1160  
   [If none, go to Conclusion]  

2. Now I have some questions about the irrigation systems and water used on the selected field for the 2022 wheat crop.  

   a. What type(s) of irrigation system(s) was (or were) used to irrigate the selected field?  
      [Show System Type Codes in the Respondent Booklet. Enter System Type Code for the system covering the most field acres.]  

   b. What was the total quantity of water applied to the selected field during the entire growing season? INCLUDE all water used from both on-farm and off-farm sources.  
      [If operator cannot provide item 2b, ask (i) and (ii). Otherwise go to 2c]  
      i. What is the total number of hours this system was used to apply water to the selected field during the wheat growing season?  
      ii. How many gallons per minute were applied?
c. What percent of the water used to irrigate the selected field through this system came from surface water sources?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
<td>1166</td>
</tr>
<tr>
<td>Number of Irrigations</td>
<td>1167</td>
</tr>
</tbody>
</table>

d. What was the number of times the selected field was irrigated during the wheat growing season using this system? INCLUDE any pre-plant irrigation.
e. What was the pump type? [If more than one pump in the system, enter type for pump closest to water source.]
   1. Turbine
   2. Submersible
   3. Centrifugal
   4. Booster
   5. Siphon
   99. No Pump
   [If code 99, go to item j.]
   Code 1168

f. What was the average pumping rate?
   Gallons per Minute 1169

[If item 2a = code 1–9 (Pressure System), ask-]

g. What was the system operating pressure?
   Pounds per Square Inch 1170

h. What was the primary motor type used to pump the water?
   1. Diesel
   2. Gasoline
   3. LP Gas
   4. Natural Gas
   5. Electricity
   Code 1171

i. What was the average motor size?
   Horsepower 1172
e. **What was the pump type?** [If more than one pump in the system, enter type for pump closest to water source.]

<table>
<thead>
<tr>
<th>Code</th>
<th>1168</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Turbine</td>
<td></td>
</tr>
<tr>
<td>2. Submersible</td>
<td></td>
</tr>
<tr>
<td>3. Centrifugal</td>
<td></td>
</tr>
<tr>
<td>4. Booster</td>
<td></td>
</tr>
<tr>
<td>5. Siphon</td>
<td></td>
</tr>
<tr>
<td>99. No Pump</td>
<td></td>
</tr>
</tbody>
</table>

[If code 99, go to item j.]

f. **What was the average pumping rate?**

| Gallons per Minute | 1169 |

[If item 2a = code 1–9 (Pressure System), ask-]

g. **What was the system operating pressure?**

| Pounds per Square Inch | 1170 |

h. **What was the primary motor type used to pump the water?**

<table>
<thead>
<tr>
<th>Code</th>
<th>1171</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Diesel</td>
<td></td>
</tr>
<tr>
<td>2. Gasoline</td>
<td></td>
</tr>
<tr>
<td>3. LP Gas</td>
<td></td>
</tr>
<tr>
<td>4. Natural Gas</td>
<td></td>
</tr>
<tr>
<td>5. Electricity</td>
<td></td>
</tr>
</tbody>
</table>

i. **What was the average motor size?**

| Horsepower | 1172 |

[If No Pump was used, item 2e = 99, ask-]

j. **What was the average flow rate?**

| Gallons per Minute | 1173 |

k. **How many other acres on this operation were irrigated using the selected field’s irrigation system during the 2022 growing season?** EXCLUDE the selected field.

| Acres | 1174 |
3. What was the cost of the fuel or electricity used to irrigate the selected field? INCLUDE operator, landlord, and contractor costs.

Dollars & Cents per Acre: 1189

Total Dollars: 1190

Code: 1191

4. Was any water purchased to irrigate the selected field? INCLUDE landlord’s share and purchases from all sources.

Yes = 1
No = 3

[If item 4 = 1 ask -- Otherwise go to item 5.]

a. What was the total cost for the water purchased for the selected field during the 2022 growing season? INCLUDE operator, landlord, and ditch maintenance costs for the selected field.

[If siphon tubes were used, item 2a = 10 or 11, ask --]

5. What would be the total cost to replace all the siphon tubes used?

[If poly pipe system was used, item 2a = 14, ask --]

6. What was the total amount spent for poly pipe used on the selected field during the 2022 growing season? INCLUDE operator, landlord, and contractor costs.

IRRIGATION TYPE CODES

PRESSURE SYSTEMS

1. HAND-MOVE
2. SOLID or PERMANENT SET
3. SIDE ROLL or WHEEL LINE
4. CENTER PIVOT or LINEAR MOVE with sprinklers on main line
5. CENTER PIVOT or LINEAR MOVE with sprinklers below main line but more than 2 feet above ground
6. CENTER PIVOT or LINEAR MOVE with sprinklers less than 2 feet above ground
7. BIG GUN
8. LOW FLOW IRRIGATION (drip, trickle or micro sprinkler)
9. OTHER - SPECIFY

GRAVITY SYSTEMS

10. SIPHON TUBE from unlined ditches
11. SIPHON TUBE from lined ditches
12. PORTAL SYSTEM from unlined ditches
13. PORTAL SYSTEM from lined ditches
14. ANY POLY PIPE SYSTEM
15. GATED PIPE (not poly pipe)
16. IMPROVED GATED PIPE (surge flow or cablegation not poly pipe)
17. SUBIRRIGATION
18. OPEN DISCHARGE FROM WELL or PUMP
19. OTHER - SPECIFY

United States Department of Agriculture
National Agricultural Statistics Service
[If gated pipe system was used, item 2a = 15 or 16, ask--]

7. What was the average diameter of gated pipe used to irrigate the selected field? 

   a. What was the total length of gated pipe used? 

---

**IRRIGATION TYPE CODES**

Section G, Item 2

<table>
<thead>
<tr>
<th>PRESSURE SYSTEMS</th>
<th>GRAVITY SYSTEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 HAND-MOVE</td>
<td>10 SIPHON TUBE from unlined ditches</td>
</tr>
<tr>
<td>2 SOLID or PERMANENT SET</td>
<td>11 SIPHON TUBE from lined ditches</td>
</tr>
<tr>
<td>3 SIDE ROLL or WHEEL LINE</td>
<td>12 PORTAL SYSTEM from unlined ditches</td>
</tr>
</tbody>
</table>
| 4 CENTER PIVOT or LINEAR MOVE  
   with sprinklers on main line | 13 PORTAL SYSTEM from lined ditches                  |
| 5 CENTER PIVOT or LINEAR MOVE  
   with sprinklers below main line 
   but more than 2 feet above ground | 14 ANY POLY PIPE SYSTEM                             |
| 6 CENTER PIVOT or LINEAR MOVE  
   with sprinklers less than 2 feet above ground | 15 GATED PIPE (not poly pipe)                       |
| 7 BIG GUN                | 16 IMPROVED GATED PIPE                              |
| 8 LOW FLOW IRRIGATION    | 17 SUBIRRIGATION                                    |
|                         | (drip, trickle or micro sprinkler)                  |
| 9 OTHER - SPECIFY        | 18 OPEN DISCHARGE FROM WELL or PUMP                 |
|                         | 19 OTHER - SPECIFY                                  |
8. Were wells used to supply irrigation water for the selected field? [Yes=1, No=3]  

   a. How many wells were used to irrigate the selected field? 

   b. What was the average diameter of the outer well casing? 

   c. What was the average pumping depth of these wells during the irrigation season? Pumping depth is the depth to water at the start of the irrigation season, plus an average decline in the water level caused by pumping during the irrigation season. 

   d. Were other fields irrigated using water pumped from wells that supplied water to the selected field? [Yes=1, No=3] 

   e. Excluding the selected field, how many other acres on this operation were irrigated using the same wells during the 2022 growing season?
9. Was any additional mainline or lateral pipe used to carry water from the source to the system in the same wells during the 2022 growing season? 

Yes = 1  
No = 3  

[If item 9 = 1 continue. Otherwise go to Conclusion.]

a. What was the average diameter in inches of the most common type of this additional pipe used? 

b. How many feet of this additional pipe were used to bring water to the selected field?
Closing Remarks
Latitude and Longitude

Teresa Green
Upper Midwest Region
Latitude and Longitude

Location of Selected Field

I need to locate the selected field of wheat on this map.

1. What county is the selected wheat field in?

   County Name: ____________________________
   State County FIPS Code: 0010

   LATITUDE
   __ __ __ __ __ __ __ __ __
   __ __ __ __ __ __ __ __ __
   decimal decimal

   LONGITUDE
   __ __ __ __ __ __ __ __ __
   __ __ __ __ __ __ __ __ __
   decimal decimal

[Enumerator Action: Use the iPad app to find the coordinates for the center of the selected field. Confirm with the operator using the aerial imagery that this is the correct field.]

We will need additional information to complete this study. We will contact you in February or March 2023 to collect it. I’ll call you then to set up a time that is good for you.

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

2. To have a summary emailed to you at a later date, please enter your email address: ____________________________
Latitude and Longitude

Marked Location
18 mi

Directions

Address
Dyersville, IA 50046
United States

Latitude 41.910778
Longitude -93.488111

Add to Favorites
Create New Contact
Add to Existing Contact