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# Conservation Effects Assessment Project (CEAP)

Interviewer's Manual



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## Chapter 1 - CEAP Purpose

### Purpose of NRI - CEAP

The primary purpose of the National Resources Inventory Conservation Effects Assessment Project (NRI CEAP) Cropland Assessment is to evaluate the environmental impacts of conservation practices located on cultivated croplands. The NRI CEAP will provide the farming community, the general public, OMB, legislators, and others involved with environmental policy issues an accounting of the environmental benefits obtained from the U.S. Department of Agriculture (USDA) conservation program expenditures. Reports summarizing the benefits of conservation programs will be produced by NRCS and may be found at: [www.nrcs.usda.gov](http://www.nrcs.usda.gov).

### Overview of CEAP

In recent decades Congress has demonstrated strong support for conservation programs through Farm Bill legislation. The intent of this legislation is to ensure the nation's farmlands remain healthy and productive and help farmers and ranchers meet the challenges they face in preventing soil erosion, maintaining water quality, and protecting natural resources such as fish and wildlife habitat.

The Farm Security and Rural Investment Act of 2002 (2002 Farm Bill) represented the single most significant commitment toward conservation on private lands in the Nation's history. Nearly \$20 billion was authorized to support implementation of conservation practices for the years 2003-2007, almost 80% above the level of funding in the 1996 Farm Bill. The 2008 Farm Bill (Food, Conservation, and Energy Act of 2008) provides additional support for conservation programs, including \$188 million allocated to support the restoration of the Chesapeake Bay and its watershed, through the Chesapeake Bay Watershed Initiative (CBWI).

The goal of these conservation programs is to save millions of acres from soil erosion, enhance water and air quality, restore and protect wetlands and wildlife habitat, and conserve agricultural water use. Private landowners

benefit from a portfolio of assistance, including cost-share, land rental, and incentive payments, and technical assistance for conservation practices.

The NRI-CEAP questionnaire is designed to collect information from a sample of farmers who will be asked about conservation practices and current and past farming practices on a specific field. The sample is drawn from the NRCS NRI area frame, which contains information about soils and climate. Combining the information from the CEAP farmer survey and the NRI database creates a picture of environmental and management conditions associated with that field. Conservation benefits are then estimated using sophisticated environmental effects models. These models are used to estimate the reduction in soil erosion, and nitrogen, phosphorus, and pesticide runoff from each sample field. This information is combined with data from other sample fields to produce an estimate for an entire area or watershed.

You will find that conservation practices may not be used on all fields in the survey. Knowing that conservation practices are not used is just as important to the modeling as knowing that conservation practices are used. Fields without conservation practices allow researchers to compare environmental impacts from fields with conservation practices. The models can be used to estimate the environmental benefits if additional conservation practices are implemented and to determine where they will produce the maximum benefit. This allows program managers to best target limited technical and financial resources.

Tracking the impact of these programs will be provided by the NRI-CEAP Cropland Assessment. The survey will collect information from all types of cultivated croplands, and will provide a comprehensive estimate of chemical and nutrient use. Results of the assessment will provide the farming community, the general public, legislators, and others involved with environmental policy issues an accounting of the environmental benefits obtained from conservation program expenditures. Policy-makers and program managers will have the information they need to implement and modify existing programs and design new programs to more effectively and efficiently meet the goals of Congress.

The survey will be conducted in the Chesapeake Bay Watershed in 2011, and will move to other watersheds in 2012 and 2013. When the data collection is completed, NRCS will prepare a report for each watershed. The reports will summarize the results of the survey for use by researchers, government agencies, and policy makers.

## Questions and Answers

**1. What are the benefits associated with conservation programs on agricultural lands?**

Conservation programs in the United States provide assistance to reduce soil erosion, enhance water and air quality, conserve energy, and promote wetland and wildlife habitat preservation and restoration.

In addition to the environmental benefits, producers usually receive financial incentives such as annual rental payments, incentive payments, or cost-sharing payments to offset the cost of establishing certain conservation practices.

**2. How much financial assistance does the agricultural community receive for promoting conservation practices?**

Under the 2008 Farm Bill, over \$24 billion dollars is provided for conservation and conservation practices. Of this amount, \$188 million has been designated to the Chesapeake Bay Watershed Initiative, to be used in support of the restoration of the Bay and its watershed.

**3. Why is it important for an agricultural producer to respond to this survey?**

The NRI CEAP survey is an attempt by USDA to quantify the benefits of good environmental practices. By responding to the survey a producer provides tangible information that shows just how he/she is being a good steward of the land.

Only those people who cultivate and till the land can give us an accurate measure of the impact conservation programs are having on our natural resources. By demonstrating the valuable contribution made by America's farmers and ranchers to the environment, respondents ensure that conservation programs will continue to provide America's working lands with the assistance needed to be both productive and environmentally friendly in the future.

Even if the producer is not presently participating in any conservation programs, information in this survey about their operation will be used in conjunction with all other responses to estimate the potential benefits that could be achieved by expanding these conservation programs.

**4. What are some of the conservation programs that farmers currently practice under?**

Programs offered by the USDA include the Environmental Quality Incentives Program (EQIP), Wetlands Reserve Program (WRP), Wildlife Habitat Incentives Program (WHIP), Conservation Reserve Program (CRP), Conservation Reserve Enhancement Program (CREP), Conservation Security Program (CSP), Agricultural Water Enhancement Program (AWEP), Agricultural Management Assistance (AMA) Program, and the Chesapeake Bay Watershed Initiative (CBWI).

There are many additional programs offered by State and local governments, private industries, and non-profit organizations.

**5. How will the information collected in this survey be used?**

The data collected from an individual operation will be combined with all other reports. Information from NRCS hydrologic, climate, and soil databases will be added to create a complete picture of environmental and management conditions. The combined data will be used to estimate conservation benefits derived from conservation programs.

## Chapter 2 - Terms and Definitions

Enumerators working on the CEAP should be familiar with the definitions of the terms listed below. Descriptions of irrigation systems are provided in [Chapter 5 of this manual](#).

actual nutrients	harvested acres
active ingredients	hay
adjuvant	highly erodible land (HEL)
anhydrous ammonia	herbicide
	hundredweight (cwt)
beneficial insects	
buffer strip	idle land
	implement
commodity	inaccessible
confidentiality	input
conservation tillage	insecticide
contour farming	integrated pest management (IPM)
Conservation Reserve Program(CRP)	irrigation set
Conservation Reserve Enhancement Program(CREP)	landlord
conventional tillage	lime
cover crop	manure
crop rotation	military time
cultivated cropland	mulch till
date, reference	N-P-K
defoliant	Natural Resources Conservation Service (NRCS)
double crop	nitrogen (N)
	nonresponse
fallow	no-till
farm	
Farm Service Agency (FSA)	operator
fertilizer	out-of-business
fertilizer analysis	
field	partner
filter strip	pesticide
fungicide	phosphate (P <sub>2</sub> O <sub>5</sub> )
	plant tissue test
gallons per minute	potash (K <sub>2</sub> O)
grassed waterways	

questionnaire	surface water sources
refusal	survey
rent, cash	survey period
rent, share	tank mix
respondent	terrace
ridge tillage	
	underground outlets
sample, probability	
sampling frame	wetting agent
sampling unit	worker
scouting	wetlands
seed	
strip cropping	yield map
sub-irrigation	yield monitor

## Chapter 3 - Survey Procedures

This chapter provides an overview of the questionnaire and other materials for NRI CEAP, and general guidelines for collecting data. The NASDA Enumerator Handbook covers administrative matters.

**As a minimum, the Field Office will provide the following:**

- Copies of presurvey publicity materials mailed to each respondent
- County maps with the sample point locations
- Aerial photography with NRI sample point location
- FSA Name & Address Sheet
- Questionnaires with labels identifying sample point
- Extra questionnaires without labels
- NRCS Supplement (one for each questionnaire)
- Respondent booklets containing code tables and a burden statement
- Supplements for questionnaires (Cropping History for Vegetables only, Pesticide, Manure, Fertilizer, and Field Operations)
- Envelopes for mailing completed questionnaires
- Several copies of NAS-011 (Time, Mileage, and Expense Sheet) and envelopes for mailing back to the FO

**You should already have these items on hand:**

- iPad
- Interviewer's Manual
- Highway and street maps
- Black lead pencils
- Red pencils
- Name tag
- NASDA Identification Card
- NASDA Enumerator Handbook
- Ball point pens for completing NAS-011
- Calculator

## Questionnaires

The NRI CEAP survey includes a questionnaire which will be completed by interviewing farm operators and an NRCS supplement which will be completed in county NRCS offices.

The farm operator questionnaire will collect information about production practices, including fertilizer, manure and chemical use, tillage information, and use of conservation practices. The operator will be surveyed for the 2009, 2010, and 2011 crop years.

Additional information regarding conservation plans and structural practices will be completed on the NRCS supplemental questionnaire.

## Respondent Booklet

The Respondent Booklet provides information respondents need to reference when answering some survey questions, such as code lists. Often, this information does not appear in the questionnaire. Using the Respondent Booklet can prevent confusion and save interview time.

Occasionally, the respondent may need help in becoming familiar with how to use the booklet. This is especially important when using the longer code lists, such as the pesticide list. While conducting the interview, take a moment when suitable to show the respondent how to reference the appropriate code lists in the booklet. This should help the interview go more quickly.

Some lists in the respondent booklet are there to let the respondent know what type of response we are looking for to certain questions. For example, in Section F, when asking the respondent “How was this (pest control) product applied?”, show the respondent the Application Method Code List printed in the Respondent Booklet. Otherwise, the respondent may take additional time explaining in detail how he applied the material, when all you really wanted to know was that the material was applied as “Broadcast, ground, w/hood, incorporated” (method code 22).

## County Maps and Aerial Photographs

You will be provided a NRI county map which indicates the location of the points selected for enumeration during 2011. You will also be provided an aerial photograph for each of the sample points. On the aerial photograph the NRI Point will be marked with a yellow '+'. Note: the aerial photograph can also be viewed on the NRI CEAP iPad application.

## FSA Name & Address Sheets

Since the NRI CEAP is an area-based survey, this means the field surrounding the sample point is the 'target' of the NRI CEAP data collection. You will be provided a listing of all individuals who were registered at FSA during the 2009 or 2010 sign-up periods for each sample location, as these individuals are likely the farm operators.

Some sampled points may not have been located in the FSA database. Also, in some cases, the name(s) on the Name and Address sheet may not turn out to be the operator at the sample point location. The operator of these points must be located. Finding the "unknown" operators for sample points will be explained in Chapter 4.

## Data Collection from NRCS County Offices

Due to the complexity of conservation plans and structural practices on the selected fields, NASS field enumerators will work with and collect information on these specific subjects at county NRCS offices during the NRI CEAP data collection period. County NRCS personnel will assist enumerators in answering the questions on the **NRCS Supplement**.

NRCS personnel will check their records for all conservation plans and contracts that apply to the sampled field.

A NRCS supplemental questionnaire should be completed for all sampled point locations where an operator interview was completed. Before you visit the NRCS office, you must:

- Record the CEAP POID, the Farm Number, Farm Tract, and Field Number (found on the FSA Name & Address Sheet) on the NRCS supplemental questionnaire.
- Copy the field boundaries drawn by the operator on the iPad onto the paper copy of the aerial photograph. Field boundaries should be drawn onto the paper aerial photograph in RED.
- Fill out a 'NRCS Name & Address' sheet for each point. On this sheet, record the Farm Number, Farm Tract, and Field Number (found on the FSA Name & Address Sheet). Also write the name of the operator and the name of the person who completed the field interview, if different than the operator. This will help NRCS locate the correct records for the sample point.

When you drop off the questionnaire, you should provide NRCS with the NRCS Name & Address Sheet and the aerial photograph for their use in locating the proper records. The aerial photograph **MUST** be returned to you when you pick up the completed NRCS questionnaire.

The preferred order of data collection is to enumerate the questionnaire first and then go to the county NRCS office to collect the information on the NRCS Supplement. This avoids collecting information for potential refusals or inaccessibles. NRCS supplements are not stand alone documents and are only considered complete when the questionnaire has been completed.

## Planning Your Work

The State Fips code, county Fips code, and the NRI point number will appear on the questionnaire, the aerial photographic image, the FSA Name & Address sheet, and county map. It is very important that you review all materials and make sure that the correct questionnaire is matched with the materials for the same point.

Next, review the FSA Name & Address sheet to determine the if there was a match with a farm operator. Remember, the farm operator may or may not live near the sampled field. Mark the home address of each operator you need to contact on a highway map before you start to interview. Plot the “unknown” operator points at the actual field location. Use this map to plan your daily travel; this will keep travel expenses down and save time.

It is important to locate all operators as soon as possible in the enumeration period. Tell your Supervisor about any sampled point for which you cannot locate an operator, and any operator whose home or office you cannot find.

Visits to the county NRCS offices to complete the NRCS supplement should be made in an efficient manner during the survey period. The NRCS supplements must be completed and returned to the Field Office at the same time as the operator questionnaire, and all must be returned by the survey due date.

## Respondent Burden

You will reduce the burden on the respondent if you are thoroughly familiar with the questionnaire and instructions. Pay close attention to skip instructions in the questionnaire to avoid asking questions needlessly. When skip instructions are not printed after an item, you will continue with the next item.

Be aware of the estimate of average completion time in the Burden Statement. The estimated average completion time is based on experience with previous NRI CEAP surveys and the Office of Management and Budget (OMB). OMB is an agency that approves all surveys conducted by the federal government. The expected average interview length for the NRI CEAP is **70** minutes. Burden statements are printed on the Respondent Booklet.

## Interviewing

Interview the farm operator, if possible, because information collected from other people is often less accurate. If the operator says someone else is more knowledgeable, interview that person.

**For NRI CEAP, we will only collect information for the years in which the current (2011 crop year) operator has made the day-to-day decisions on the selected field location.**

If the operator is not present when you visit, but is expected soon, wait for the operator, or make other contacts nearby and return a little later.

If the operator is too busy to be interviewed at that time, set up an appointment at his or her convenience. Be sure to keep the appointment, and be on time! If an emergency prevents you from keeping the appointment, inform the operator beforehand and reschedule the interview.

If the operator will not be available before the survey is over, try to interview someone who is well informed about the operation. A partner, family member or an employee may know enough about the aspects of the farm operation covered in the questionnaire to give you the information needed.

The NASS rule-of-thumb is to make up to three visits (the first visit plus two call backs), if necessary to get an interview. If you have an appointment or information from a neighbor on when to try to reach the operator, you should return then. If not, make each visit at a different time of the day or evening. If you are unable to arrange an appointment for an interview after three visits, notify your supervisor.

Respondents often ask how long the interview will take. Never contradict the burden statement printed on the respondent booklet; however, adding to it is okay. For example, you might say something like this: "The official nationwide average for this survey is 70 minutes, but the interviews I have done in this area averaged about \_\_ minutes." Be honest about the average time, even if your interviews average longer than the time estimate in the burden statement.

Encourage respondents to have farm records at hand. Records that will be useful during the interview include farm conservation plans, nutrient management plans, records of pesticides, fertilizer, and manure

applications, soil tests, and irrigation records. Using records encourages accurate information and completing the interview will take less time.

The first time you ask a question, always read the question exactly as worded in the questionnaire. If the respondent did not hear or did not understand the question, repeat it using the same wording. Use any include statements or explanations printed with the question in the questionnaire. If the respondent still doesn't understand, or asks you to explain, use what you learned in training and information from this manual to explain what we need.

Ask questions in the order they appear in the questionnaire. Do not skip any questions unless skip instructions printed in the questionnaire allow you to do so.

Sometimes, a respondent will volunteer information before you ask a question. When you get to a question the respondent already answered, take the opportunity to verify the information. Say something like, "I think you told me this earlier, but let me just be sure I got it right." Then ask the question exactly as worded. This doesn't make you look like you weren't listening. On the contrary, it emphasizes to the respondent the need to get things right.

Sometimes you will need to probe to get an adequate answer to a question. You should probe when the respondent cannot answer the question, when the answer isn't exact enough to record, when you think the answer may be incorrect because it doesn't fit with information you've already obtained, or when you think the respondent didn't understand the question.

The purpose of probing is to verify unusual data or to correct misreported data. You must be careful when you phrase your probing questions that you do not influence the respondent's answers. Probes should be "neutral," that is, they should not suggest one answer over another.

For example, don't say things like, "Use beneficial organisms in this field, you didn't do any of that, did you?" Instead, say, "Did you use any beneficial organisms to control pests in this field?" If the respondent asks for more information, explain that, "Beneficial organisms include insects like green lacewings or ladybugs that are natural enemies of crop pests."

As another example, if a respondent tells you that a value is between two amounts, such as, "Oh, I used a seeding rate of between 1 and 2 bushels per acre," you should ask, "Would you say it was closer to 1 bushel per acre or 2 bushels per acre, or what amount exactly?"

Probes should also be “nonthreatening.” Be careful that you don’t appear to be questioning or challenging the respondent’s answers. Don’t say, “That can’t be right, three bushels of seed per acre is way too much!” Instead, say, “Does that three bushels include reseeding? I only want the seeding rate for the first time the field was seeded.” Then make corrections to data items if necessary or make notes of the respondent’s answer if it is correct.

Be sure to make good notes. This is especially important when you find unusual situations or the respondent explains why information that seems incorrect is correct. Also write down any complicated calculations you have to make to come up with an answer.

The notes you record in the questionnaire will help the survey statistician understand this operation when reviewing the questionnaire. Make sure the notes are clear and can be read. Notes can be the single most valuable editing tool available to the office statistician.

**NEVER erase a note unless it is wrong!**

After completing each interview, be sure to review the questionnaire while the interview is still fresh in your mind. Make sure you recorded all answers correctly and the questionnaire is complete. Check your calculations. Make sure all notes are clear.

## Entering Data

Use a black lead pencil to record data and notes; never use ink on a questionnaire. Make all entries clear, and easy to read. Entries in check boxes and item code boxes must be entirely inside the boxes.

Record responses in the unit shown in the questionnaire (such as acres, bushels, or inches). If a respondent gives an answer in a different unit, write the answer outside the printed box, convert it to the required unit, and record the converted data in the box.

If the respondent answers "none" to a question, enter a **dash** (-----) in the box, and **not** a zero.

For questions answered with a code number, enter the number that goes with the respondent's answer. If the respondent answers using only the code number, verify that the code is correct by repeating the answer assigned to the code in words.

The State Office must be able to tell the difference between questions asked and the answer was NO or ZERO, and questions asked, but the respondent could not answer (DK) or did not answer (REFUSED). For any question, if the respondent doesn't know the answer, then record DK or "DON'T KNOW" next to the question. If the respondent refuses to answer, write "REFUSED" next to the question.

Record data to the nearest whole number, unless a decimal point is preprinted in the box. Place numbers correctly in relation to decimal points, and fill in every space printed after them. Use zeros as fill when answers are not given to as many decimal places as required by the data cell.

If answers appear unusual, but really are correct, make notes in the margins to explain. Do not write notes or put a "0" in answer boxes.

## Questionnaire Format

The following formatting conventions apply to the NRI CEAP questionnaires.

### Interviewer Instructions

Interviewer instructions are printed in italics, and enclosed in square brackets. These instructions will provide important directions you will need to pay attention to when completing the questionnaire.

**Figure 1** Example of interviewer instructions.

Were any pest control products applied to this field for the 2009, 2010, and/or 2011 crop? [ <i>If no pest control products applied, go to Section G.</i> ] .....	CODE
	<input style="width: 100px; height: 20px;" type="text"/>

### Include Statements and Check Lists

Include statements and check lists are used to ensure that items sometimes forgotten are not missed. These "include" statements and "check lists"

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should **NOT** be considered complete lists of items to be included in the data fill-ins.

When the reference to a previous item number is printed in italics and enclosed in brackets, take the data entered in that previous item and use it to FILL IN when you read the question. In the example below, if 110 was the data reported in Item 2, you would read the question saying “Of the total 110 acres operated, how many acres are considered Cropland, including land in hay and cropland in government programs?”.

**Figure 2** Example of ‘data fill-in’ questions.

Of the total [*Item 2*] acres operated, how many acres are considered Cropland, including land in hay and cropland in government programs? . . . . .

ACRES

. ____
--------

### Text Fill-ins

Questions in table headers frequently refer to text in the table rows used to FILL IN the wording of the question. In this example, the question to ask is "Who did the majority of the scouting for --?"

**Figure 3** Example of a text 'fill-in' question.

4. Was this field scouted for--

1		2 [If YES, ask--] Who did the majority of the scouting for [column 1]--	
		YES=1	CODE
a.	weeds? . . . . .	1705	1709
b.	insects and mites? . . .	1706	1710
c.	diseases? . . . . .	1707	1711
d.	other? (specify) . . . .	1708	1712

1 Operator, partner or family member?  
2 An employee?  
3 Farm supply or chemical dealer?  
4 Independent crop consultant or commercial scout?

### Instructions for Respondents

Prompts, "includes and excludes," and other instructions for respondents are in italics and enclosed in parentheses. These prompts are to help you and the respondent when a question arises as to the intent, meaning, or what is included in the question. Read these when needed to clarify the meaning of the question.

**Figure 4** Example of instructions to read to respondents.

What was the <b>total</b> quantity of water applied to this field during the 2011 growing season? <i>(Include ALL water used from both on-farm and off-farm sources.)</i> . . . . .	INCHES PER ACRE
--	-----------------

### Item Code Boxes for Interviewer Use

Code boxes for interviewer use generally have thin solid lines.

**Figure 5** Example of code boxes for interviewer use.

Were written or electronic records kept for this field to track the activity or numbers of weeds, insects, or diseases? . . . . . YES = 1	CODE
---	------

### Item Code Boxes with Decimal Points

Some code boxes have a printed decimal point followed by one or two marked spaces. They show that you should record data to the tenth or hundredth place. When entering data into these cells, place the number correctly in relation to the decimal points. Fill in the decimal places with zeros when the respondent does not give answers to the number of decimal places needed, or when he gives answers in whole numbers.

For example, if a cell has a decimal point followed by one underlined space, you should record responses in TENTHS. Record an answer of “18” as “18.0.” Record an answer of 7.25 as 7.3 (Round the response to one decimal point.).

**Figure 6** Example of code boxes for recording data to one or more decimal places.

Total acres in the field (1a + 1b + 1c + 1d + 1e + 1f) are? . . . . .	ACRES
	• <u>   </u>

### Item Code Boxes for Recording Dates

Some items require recording dates in MM DDYY format. These cells have six preprinted underlines. MM stands for the two digits that refer to the month, DD stands for the two digits for the day, and YY is for the two digits for the year.

For example, May 5, 2011, should be entered as                    .

### Office Use Boxes

Shaded boxes with thick solid lines are for Office Use only. Do not make entries in office use boxes.

**Figure 7** Example of an 'office use' box.



### Yes/No Questions

Questions that can be answered YES or NO are of one of the following formats. If the respondent doesn't know if the answer is YES or NO, then record DK next to the code box. If the respondent refuses to answer, then record "REFUSED" in notes outside the box.

### YES/NO Check Boxes

One format for YES/NO questions is to use check boxes. Check boxes are used when there is a "GO TO" instruction associated with either the YES or NO answer.

**Figure 8a** Example of a Yes/No check box question.

<b>Was a soil test performed on this field to determine fertilizer or manure application needs?</b>	<b>CODE</b>
YES - [Enter code 1 and continue.]	NO - [Enter code 3 and go to question 15.]

Another example of a Yes/No question is shown below. Spacing on the questionnaire does not allow for the No code to be shown, but it is included in the question instead.

17. Was this crop irrigated? If YES enter 1 and continue. If NO, enter 3 and go to page 8, 2005 crops.	YES=1			
--	-------	--	--	--

### YES=1 Boxes

Another format for YES/NO questions is the response code YES=1 printed next to the code box. If the answer to a YES/NO question is YES, enter code 1. If the answer is NO, then enter a dash in the box to show the question was asked and the respondent answered NO. Since you are not entering a number for NO, this is the only way to show you asked the question, and the answer was NO.

**Figure 9** Example of a “Yes = 1” question.

Was laser leveling used? .....	YES = 1		CODE
--------------------------------	---------	--	------

### Multiple Choice Questions with Coded Response Categories

Multiple choice questions allow the respondent to choose only ONE answer from several possible answer choices offered. Each response category is given a code number and the group of answer choices are enclosed in a box with a solid outline. You will enter the respondent’s answer as a code number.

**Figure 10** Example of a question with coded response categories.

In 2011, what was your (the operator’s) major occupation?

<ul style="list-style-type: none"><li>1 Farm or ranch work</li><li>2 Hired farm manager</li><li>3 Something else</li><li>4 Retired</li></ul>	.....		CODE
--	-------	--	------

### Questions with More than One Sub-part

Questions with more than one sub-part are separate questions. The main question (the “stem”) has an item number. Sub-parts to the question are identified with a lower-case letter. Each sub-part is a separate question and must be asked separately. You should read the question stem followed by the ending sub-part associated with the letter. If there are lots of sub-parts, you will probably only need to read the stem for the first two or three sub-parts.

Once the respondent understands that the stem is repeated, though unspoken, then continue reading only the sub-parts.

**Figure 11** Example of a question with multiple sub-parts.

Was scouting for pests done in this field due to a –

a. Pest advisory warning? .....	YES=1	
b. Pest development model? .....	YES=1	

## Framework and Reference Period for Reporting Data

The NRI CEAP questionnaire is designed to collect information about production practices used for 2009, 2010, and 2011 crops on the selected field. Annual conservation management practices are asked for the same time frame. The pest management questions apply only to the 2011 crop year.

Data will only be collected for the crop year(s) in which the current (2011 crop year) operator of the selected field made the day-to-day decisions. A situation may arise when an operator of the selected field can provide data for the most recent crop year, but may not have records on hand to provide data for an earlier crop year(s). Collect the information for the current year and make good notes for the survey statistician to follow with the reasons the earlier crop year(s) were unavailable.

Fertilizer, manure, and pesticide data for each crop year cover a period of immediately **after** harvest of the preceding crop, and continue through all applications made for the specific crop year. Post-harvest pesticide applications to the harvested crop are excluded.

Field operations data for each crop year are reported **beginning** with the first tillage operation **after** removal of the previous year's crop from this field, and **ending** with the harvest of the crop.

Small grains that are planted in the fall are considered part of the next year's crop - for example, winter wheat that is planted in the fall of 2010 is counted as a crop for 2011. If the small grain is harvested for grain and again for straw, include operations data for both harvests. Field operations for small grains that are planted for cover crop should also be included.

We do not record hauling activities from the edge of the field to the first point of storage on the NRI CEAP questionnaire.

## **Nonresponse**

Most farmers are willing to furnish the information asked for in NASS surveys, but in every survey some will refuse to do so.

The key to reducing the chances of getting refusals is to be courteous and friendly, but persistent. Try to get cooperation by explaining the purpose of the survey, the need for accurate agricultural statistics, and the confidentiality of the data. Make use of materials explaining the survey purpose provided by your Field Office.

Above all, do not become discouraged when you get a refusal. Continue to meet farm operators with ease, friendliness and optimism as you contact other assigned operators.

If you are unable to conduct an interview, note the reason on the questionnaire. Also, make a note about any other information you think might be helpful to the Field Office.

## Wrapping Things Up

After completing the interview, write on the outside of the survey envelope the name, address, and phone number of the person who was interviewed. Review the questionnaire carefully to make sure you have collected and recorded all survey items correctly. Double check your calculations. Comments should be clear and pertain to the items on the questionnaire.

**Important:** Make sure that there is no personal information anywhere on the questionnaire.

A NRCS supplementary questionnaire must be filled out for every sample point where an interview was completed. The aerial photograph will be used by the NRCS office when they complete their questionnaire, but **MUST** be returned to you when you pick up the completed NRCS questionnaire.

After you pick up your completed NRCS questionnaires, you should return the completed work to the Field Office. In each survey envelope, make sure you have:

- Completed operator questionnaire and supplements
- Completed NRCS questionnaire
- Aerial photograph
- FSA Name & Address Sheet
- Comment sheet

Confirm that the State Fips, county Fips, and point number match for all pieces.

Turn in your completed work according to the instructions you receive from your supervisor. If you think the last few questionnaires you complete might not reach the Field Office before the final due date, call your supervisor.

Keep a record of when you completed each questionnaire and when you passed it on to your supervisor or mailed it to the Field Office. This will help the Field Office find survey materials if they are delayed.

**Important:** The aerial images and county maps that are provided for each cropland point **must be returned** to the regional NRCS data labs at the end of the survey period. These images are confidential and will become part of the official record for the survey. It is imperative that these images be accounted for at all times. Failure to do so may result in a lower enumerator evaluation.

## **Confidentiality**

The following information is considered confidential and should be handled accordingly.

- Location of NRI sample points found on NRI county maps and aerial photographs
- Information listed on the FSA Name & Address Sheet
- Information reported on the questionnaires and supplements

Do not record any personal information (names/address/phone) on the questionnaires, supplements, aerial photography, or map, in order to maintain confidentiality across agencies.

## Chapter 4 - Identification and Screening

### Identifying the Point Location and Operator

#### Identifying the Sampled NRI Point Location

All sampled points in the NRI CEAP survey will be marked on a county map and an aerial photograph, with an “+”. The aerial photograph is available on your NRI CEAP iPad application. You have also been provided a paper copy of the aerial photograph, as a backup in case there is no signal. Prior to enumeration, check to confirm that the state, county, and sample point information listed on top of the aerial photograph matches the point location on the highway map and the questionnaire label.

**The location of the NRI sample point and information contained on the aerial photograph is considered strictly confidential. The photograph MUST be returned to your State Field Office.**

#### Identifying the Operator of the Selected NRI Point

Since the NRI CEAP is an area-based survey, this means the field surrounding the sample point is the ‘target’ of the CEAP data collection. In order to collect information about the field, we must first determine the current operator of the field.

One quick and efficient way to determine the operator of all selected fields is through use of the Farm Service Agency (FSA) Common Land Unit (CLU) geospatial database. This database is available to NASS HQ staff through an interagency agreement.

If the selected field was registered at FSA during the 2009 or 2010 sign-up periods, the names of the individuals associated with that field was found in the database. These names will be provided to you, in a separate listing for each point. **As with our list of farm operators, the information contained in this list is considered strictly confidential. The list of farm operators MUST be returned to your State Field Office with the questionnaire.**

The Name & Address listing will contain the following information:

<b>FSA Name &amp; Address Listing</b>	
<b>Header</b>	
NRI Point Location - State	State where sample point is physically located
NRI Point Location - County	County where point is physically located
NRI Point	NRI point ID number
<b>Data Fields</b>	
<b>Field</b>	<b>Definition</b>
FSA Admin State	State where FSA signup took place
FSA Admin County	County where FSA signup took place
FSA Farm Number	FSA Farm Number
FSA Tract Number	FSA Farm Tract Number
FSA Field Number	FSA Farm Field Number
Best Name?	Y="Best Guess" operator
Name Type	OW = Owner OP = Operator OO = Owner/Operator OT = Other
WholeName	Name of operator or operation
Address, City, State, Zip	Address, City, State, Zip
Phone	Telephone number
Source Year	Year of FSA Signup
NRI Point Location - Lat	Latitude of sample point
NRI Point Location - Long	Longitude of sample point

In some cases, there may be more than one name listed for the sample point, because the farm operation signed up more than one individual. As with other NASS surveys, the person who makes the day-to-day decisions for the field is considered the operator of at the sample point, and the person who should be interviewed. The Name & Address listing will have an indicator 'Y' in the column "Best Name" for the "best guess" name for the operator of that point. This the person who should be your first point of contact for the sample point.

If it turns out that the "Best Guess" name is not the operator, ask if they know who is the operator of the field. If they do not know, try to contact other names on the FSA Name & Address List. Under no circumstances should you show anyone the Name & Address list. Names, addresses, and phone numbers are personal information and are strictly confidential.

Some sampled points may not have been located in the FSA database, so there will be no Name & Address Listing for these points. Also, in some cases, the name(s) on the Name and Address sheet may not turn out to be the operator at the sampled point location. You will need to locate the operator of these points. Follow the general guidelines that are used during the June Area Survey for locating the operator, including checking with FSA offices, county agents, feed dealers, and neighboring farmers. Online property tax records can be accessed in some areas, to determine the owner of the property.

## **NRI CEAP Questionnaire - Face Page**

### **Introduction**

Before beginning data collection, develop an introduction you are comfortable using. In the introduction include who you are, whom you represent, and the purpose of the visit. You should be familiar with the information in Chapter One of this manual.

Some operators may have already heard about the NRI CEAP on radio or television farm show broadcasts or short spots. They may also have read about the survey in publicity materials.

When making your introduction, remind the respondent that the data they report will be kept strictly confidential. All information they provide will be

used only to create state, regional, and national estimates by NRCS. Mention that farm records, particularly records of fertilizer and pesticide applications, and formal written conservation plans, will be useful.

Be prepared to answer questions the respondent may have about the purpose of the survey and uses of the data.

### **Beginning Time**

Record the beginning time (military) of the interview when the respondent agrees to cooperate on the survey and you actually start the interview. We use interview times to find out how much respondent time we are using (as a measure of respondent burden) in collecting data. We are trying to reduce interview times as much as possible and still collect the high quality data that we need.

Record in military time, i.e. 1:30 p.m. as 1330.

### **Questionnaire Label**

Your State office will provide a labeled "operator" questionnaire for each sampled NRI point in the NRI CEAP survey. The label will contain a NRI CEAP POID number, which will be a nine digit number beginning with "691.....". Also included on the label will be the State and county FIPS code of the sampled point location and the NRI point number.

These will allow you to match the questionnaire with the proper location on the county map and the corresponding aerial photograph. It is critical that the point number on the aerial photo is matched with the point number on the questionnaire so that we collect the information for the specified sample field location.

## Screening

The NRI CEAP survey will make use of an iPad application to confirm that the operation is in scope. The iPad application includes the aerial photograph with the sample point indicated and some screening questions.

Screening should be completed on the iPad prior to completing the questionnaire. However, the screening questions have also been printed on page 2 of the questionnaire, in case you cannot receive a signal.

To begin screening, show the operator the aerial photograph on the iPad, and ask:

### **Item 1: Did you make any of the day-to-day farming/ranching decisions for the field containing this point in 2011?**

The purpose of this question is to determine if we have identified the current operator for the field surrounding the sample point. Ask the question and enter “Yes” or “No” on the iPad.

If NO, the iPad will prompt you to ask the respondent to assist you in locating the current operator of the field. Locate the new operator and repeat the screening process for the new operator.

If YES, ask the respondent to draw off the boundaries for the field on the iPad. It is possible that on some aerial images, the entire field may not be shown.

The iPad will prompt you to confirm that the field boundaries are drawn.

If a signal is unavailable, have the operator draw off the boundaries on the paper copy of the aerial photograph (using a red pencil).

### **Item 2: During 2011, was the entire field enrolled in the General or Continuous Conservation Reserve Program (CRP), the Conservation Reserve Enhancement Program (CREP), or any other type of continuous cover conservation program offered by State, local, or non-profit organizations?**

Federal programs such as CRP and CREP require the acreage to be planted in long-term resources-conserving cover that will improve water quality, control soil erosion, and enhance wildlife habitat. Producers are required to

remove the land from crop production and maintain the area in continuous cover for the time period specified in the contract, usually 10 to 15 years. In return, the producer will receive an annual payment for the length of the contract period.

The continuous CRP program is different from the general CRP program, in that there is a specific time frame when contracts must be approved for the general CRP program. Conservation practices may be enrolled at any time under CRP continuous sign-up and for the CREP.

In addition to federal programs, there are many State and local conservation programs, and programs sponsored by non-profit organizations that encourage producers to plant long-term conservation cover.

- If the **entire** field was planted in continuous conservation cover, as part of a federal, State, local, or non-profit program at any time during the 2011 crop year, check the “YES” box and continue.
- If none of the acres in the selected field are planted to long-term conservation cover, check the “NO” box and continue.
- If you are completing the screener on paper, enter a “1” for Yes or “3” for No in the appropriate box and continue.

**Item 3: In 2011, was any part of this field planted to a crop (excluding hay, fruits, nuts, citrus, greenhouse and nursery crops); or idle cropland; or summer fallow?**

The NRI CEAP cropland assessment surveys land classified as cultivated cropland. Cultivated cropland is tillable land currently in crop production or cropland that is normally tilled but was idle or in summer fallow during 2011.

Summer fallow is land seeded to other crops in alternate years. Under this practice, the seed bed is tilled periodically during the growing season to control weeds and conserve moisture. No crops are planted for harvest during the current year on summer fallowed land.

The NRI CEAP cropland assessment does not include land on which crops are produced but is not tilled, for example, permanent hayland, orchards, and nursery crops. For Item 3:

Include:

- (1) Cultivated land where crops were planted and harvested
- (2) Land where crops were planted but not harvested (abandoned).
- (3) Vegetables, melon crops, and other specialty food crops.
- (3) Floriculture crops grown in the open.
- (4) Small grains pastured.
- (5) Land in summer fallow.
- (6) Cropland with no crops planted during the current year (idle).

Exclude:

- (1) Fruit orchards, vineyards, nut trees, and citrus groves.
- (2) Nursery crops, turf grass, sod, and Christmas trees.
- (3) Floriculture crops grown in containers or under cover.
- (4) Cropland diverted for government programs (including CRP).
- (5) Land in permanent hay or pasture (not in rotation with crops).

- If any part of the field was planted in an eligible crop at any time during 2011, check the “YES” box and continue.
- If none of the field was planted in an eligible crop at any time during 2011, check the “NO” box and continue.
- If you are completing the screener on paper, enter a “1” for Yes and go to Item 5, or “3” for No and go to Item 4.

**Item 4: Since 2009, was any part of this field planted to a crop in a rotation with pasture or hay (exclude fruits, nuts, citrus, greenhouse and nursery crops)?**

If the field is currently in pasture or hay, but was planted to eligible crops at any time during 2009, 2010 or 2011, the field is in-scope.

Include:

- (1) Hayland if it was in rotation with crops during 2009 or 2010 (excluding fruits, nuts, citrus, greenhouse and nursery crops, as defined in Item 3).
  - (2) Pasture if it was in rotation with crops during 2009 or 2010 (excluding fruits, nuts, citrus, greenhouse and nursery crops, as defined in Item 3).
- Check the “YES” or “NO” box as appropriate and continue.
  - If you are completing the screener on paper, enter a “1” for Yes or “3” for No and go to Item 5.

**Item 5: Was a signal present?**

Answer ‘YES’ or ‘No’ if a signal is present while the iPad is in use at the interview site. This information will be used to measure the availability of signals across the survey area, and provides feedback to NASS regarding the use of the iPad device during surveys.

**Operation In or Out of Scope**

If a signal is available such that you can complete the screening questions on the iPad at the interview site, the iPad application will indicate whether the operation is in scope and if you should proceed with the interview.

If no signal is available, the interview should proceed only if the answer to Items 3 or 4 is ‘YES’.

If “out-of-scope”, thank the respondent and conclude the interview. Complete the back page of the questionnaire, as described in Chapter 5 of this manual.

## Chapter 5 - Completing the Questionnaire

### Overview

Chapter 5 details the NRI CEAP questionnaire item by item.

#### Exhibit 5.1: Questionnaire Sections

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<u>Section</u>	<u>Section Title</u>
A	Field Characteristics
B	Conservation Plan
C	Cropping History and Conservation Practices
D	Commercial Fertilizer Applications
E	Manure Applications
F	Pesticide Applications
G	Pest Management Practices
H	Irrigation
I	Field Operations
J	Whole Farm
K	Operator and Operation Characteristics

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## Section A - Field Characteristics

### What is Section A for anyway?

The purpose of Section A is to set the stage for the rest of the NRI CEAP questionnaire. In this section the **selected field** and **conservation areas adjacent to or adjoining the selected field** are established, the acreage associated with the field and conservation areas are identified, and the tenure of the selected field is captured.

Using the aerial image provided by NRCS, Section A paints the picture for the 2011 NRI CEAP survey. The operator is the person that controls the paint brush.

Applying the paint brush to the aerial image is when you, as the enumerator, drill down to focus on the area to be included in the questionnaire. The objective is to identify the field containing the NRI point (**selected field**) AND identify the area adjoining the field that has conservation practice(s) in place (**conservation area**).

For purposes of the 2011 NRI CEAP survey, the **selected field** is defined as a continuous area of land devoted to one crop or land use. Detailed instructions on how to capture specific situations (i.e. strip cropping) are found in **Determining and Drawing Field Boundaries**.

### Identifying the Sampled NRI Point Location

The NRI divides non-federally owned lands in the United States into roughly 160 acre segments called Primary Sampling Units (PSU). Within each PSU, three points were randomly selected to become permanent sample locations.

All points are classified by a Land Use Category. The NRI CEAP cropland assessment makes use of these permanent sample locations to select from fields classified as “cultivated cropland”. For the 2011 NRI CEAP cropland assessment, 1515 cultivated cropland points in the Chesapeake Bay watershed were selected for intensive farmer surveys.

All sampled points in the NRI CEAP survey will be displayed on an aerial image with an “X” indicating the location of the sampled NRI point. Topographical maps may be used in some western States, where aerial images are not available.

The sample point is identified by a number, consisting of the State Fips, County Fips, and point number. For example, 42055\_040702R1 is State = 42 (Pennsylvania), County = 055 (Franklin county), Point Number 040702R1. It is important to remember that the State and county Fips numbers are included, because there may be a point designated 040702R1 in another county in Pennsylvania.

The sampled point locations are also printed on the county maps that you were provided.

### Determining and Drawing Field and Conservation Area Boundaries

For purposes of the 2011 NRI CEAP survey, the definition of a **selected field** is a continuous area of land devoted to one crop or land use, except where strip cropping occurs, and includes areas that are not cropped such as grassed waterways.

For purposes of the NRI CEAP survey, a **conservation area** is defined as any area of land adjoining or adjacent to the **selected field**, such as field borders, buffers, other land areas that are in conservation practices, permanent pasture, and non-ag use **that the operator associates with the selected field**.

The boundaries of the **selected field** and the associated **conservation area** should have been identified by the operator on the iPad aerial image during the initial screening (or, if the signal was not available, drawn with a red pencil on the aerial photograph).

Before you begin Section A, show the operator the boundaries that were drawn, and confirm that they are correct and they contain all land areas that the operator associates with the selected field. If necessary, redraw the boundaries.

Note that on some aerial images, the selected field and associated conservation areas may extend beyond the boundaries of the aerial image or topographical map.

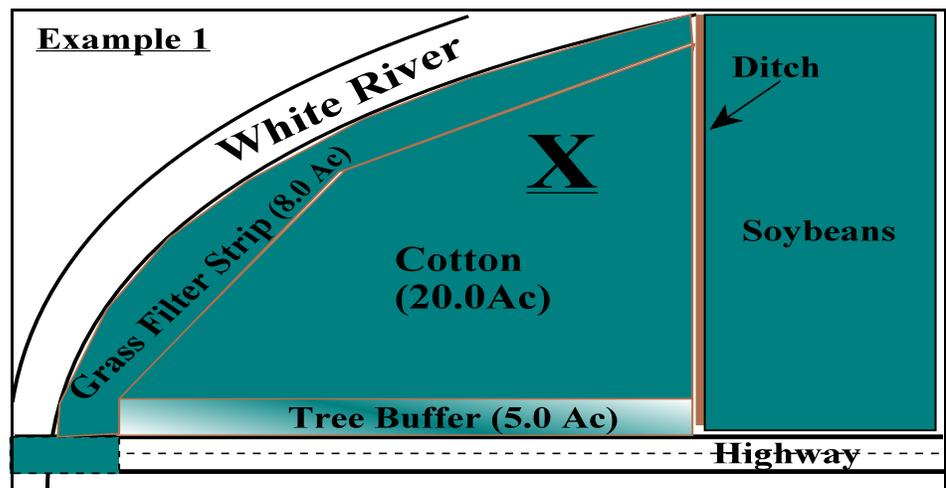
Drawing the boundaries of the entire area of interest on the aerial image should help both you and the respondent keep in mind the exact area that is the focus of the survey questions. During the interview, it will be crucial to remind the operator that we want to include any land, in or adjacent to the cropped field, that is part of a conservation practice.

If the sampled point happens to fall in a field border, buffer, or other use associated with a conservation practice, the field will include the field border, buffer, etc. and also include the cropped area adjacent to the area of the conservation practice (see example 3, page 5008).

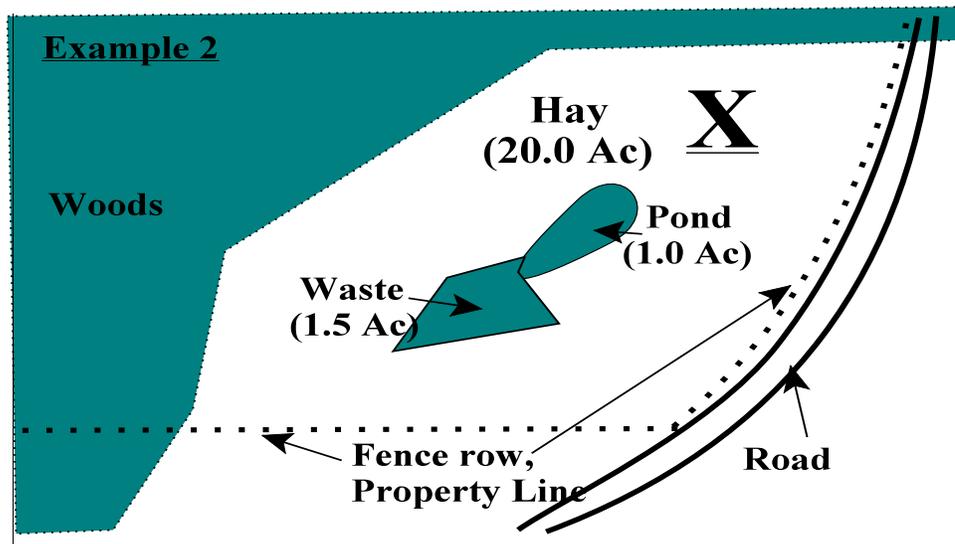
Please review the following examples.

**EXAMPLES**

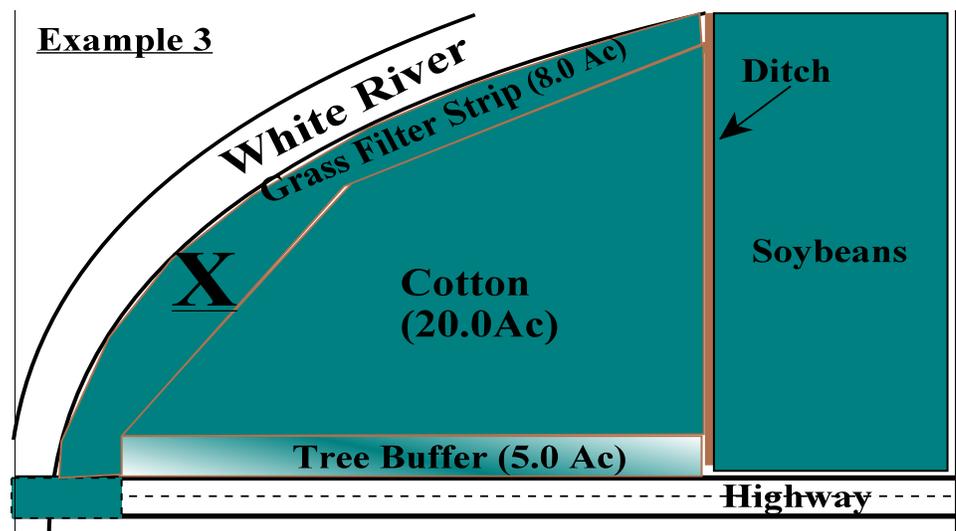
**Example 1:** A sampled point (X) falls into a 20.0 acre cotton field which has a 5.0 acre tree buffer between the cotton field and a highway. There is also an 8.0 acre grass filter strip between the cotton field and the White River. The total cropped acres of the selected field is 20.0 acres. Total acres in conservation practice but not cropped is 13.0 acres (8.0 + 5.0). The total acres in the area of interest is 33.0 (20.0 + 8.0 + 5.0) acres.



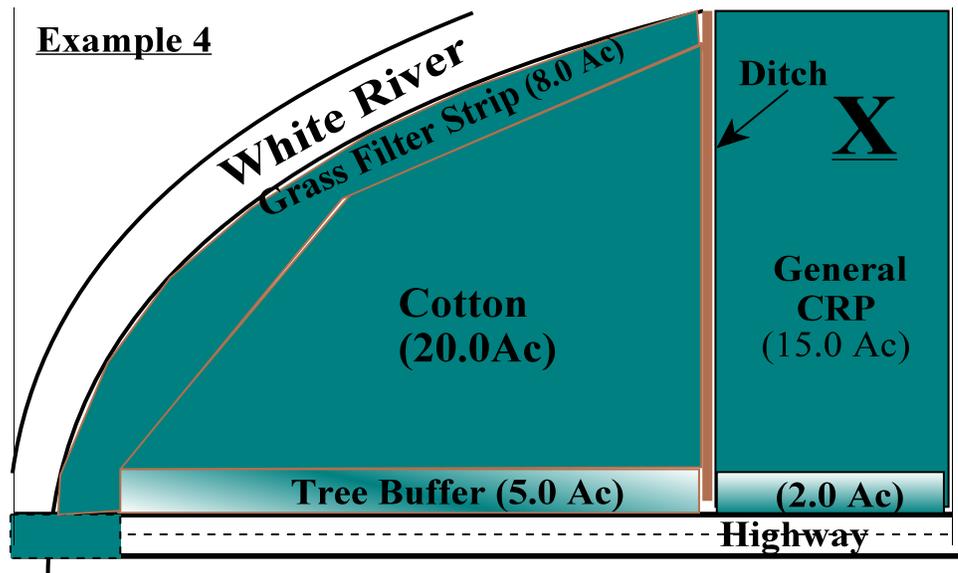
**Example 2:** A sampled point (X) falls into a newly established 20.0 acre hay field. The field contains a 1.0 acre pond, and a 1.5 acre area of brush and shrubs that is not cut for hay. The total cropped acres of the selected field is 17.5 acres (20.0 - 1.0 - 1.5). The total non-ag land is 2.5 acres (1.0 + 1.5). Total acres in the area of interest is 20.0 acres (17.5 + 2.5).



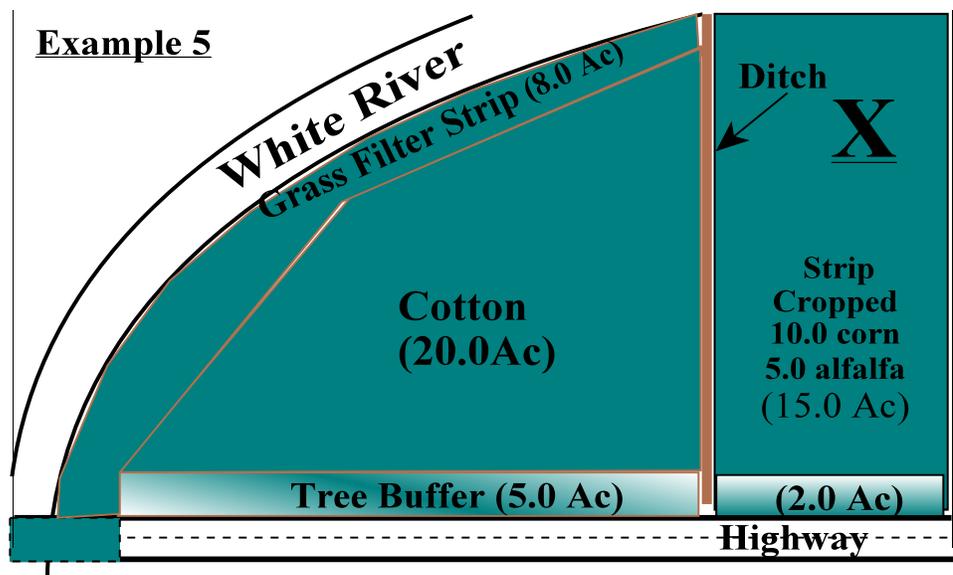
**Example 3:** In this example, a sampled point (X) falls into the 8.0 acre grass filter strip adjacent to a 20.0 acre cotton field which has a 5.0 acre tree buffer between the cotton field and a highway. Total acres in the selected field is 20.0 acres. Total acres in conservation practices are 13.0 acres. The total acres in the area of interest is 33.0 acres. (20.0 + (5.0 + 8.0)).



**Example 4:** In this example, a sampled point (X) falls into a 15.0 acre field that was signed up under the 2008 general CRP sign-up. A 2.0 acre tree buffer lies alongside the field. The total acres in the field is 15 acres. Section A should not be completed. This operation should have screened out because the field is not in cultivated cropland.



**Example 5:** In this example, a sampled point (X) falls into a 15.0 acre field that is strip cropped in alfalfa and corn. A 2.0 acre tree buffer is in place on the south side of the field. Of the 15.0 acres cropped, corn is planted on 10.0 acres of strips throughout the field and alfalfa is planted on 5.0 acres throughout the field. Overall, each strip of both crops are treated the same. The selected field is 15.0 acres (10.0 acres of corn and 5.0 acres of alfalfa). The 2.0 acre tree buffer is recorded as a conservation practice, not cropped. The total area of interest is 17.0 acres.



**Item 1: In 2011, how many acres in the selected field and conservation area containing the sample point were –**

**Item 1a - Planted or cropped (including hay acres in rotation with crops in 2009 or 2010)?**

Cropland is tillable land currently in crop production.

Include:

- (1) Land where crops were planted and harvested
- (2) Land where crops were planted but not harvested (abandoned).
- (3) Vegetables, melon crops, and other specialty food crops.
- (4) Land in hay crops that were in rotation with crops during 2009 or 2010.
- (5) Small grains pastured.
- (6) Cropland seeded for any perennial crop use, such as new strawberry plantings, new alfalfa seedings, etc. even if these crops will not be harvested this year.

Exclude:

- (1) Permanent hayland that was not in rotation with crops during 2009 or 2010.
- (2) Fruit orchards, vineyards, nut trees, and citrus groves.
- (3) Nursery crops, turf grass, sod, and Christmas trees.
- (4) Land in summer fallow.
- (5) Idle cropland (no crops planted or harvested in current year).
- (6) Cropland diverted for government programs (including CRP).

- Record the acres planted to the nearest tenth (1/10).

**Item 1b - In field borders, grassed waterways, buffers, and other uses associated with conservation practices but not cropped?**

Include:

- (1) Any acreage inside the tract boundaries that is not cropped, and is associated with some conservation practice.
- (2) Any acres along or adjacent to the selected field which qualify as a conservation practice.
- (3) Land diverted for Government programs, such as continuous CRP, CREP, or FWP acres.

Exclude:

- (1) Woodland or wasteland not in any conservation practice.
- (2) Acres set aside as part of a general CRP sign-up.

- Record the acres planted to the nearest tenth (1/10).

**Item 1c - Idle cropland, summer fallow, or pasture in rotation with crops in 2009 or 2010?**

Idle cropland is land not used for crops during the current year. Summer fallow is land seeded to other crops in alternate years. Under this practice, the seed bed is tilled periodically during the growing season to control weeds and conserve moisture. No crops are planted for harvest during the current year on summer fallowed land.

Include:

- (1) Cropland with no crops planted during the current year.
- (2) Acres tilled in the past which could be plowed and planted again without clearing brush.
- (3) Uncultivated skipped areas in a skip row cotton field.
- (4) Pasture only if it was in rotation with crops during 2009 or 2010.

Exclude:

- (1) Cropland seeded for any perennial crop use, such as new strawberry plantings, new alfalfa seedings, etc. even if these crops will not be harvested this year. They should be recorded as cropland (in 1a).
  - (2) Acreage planted to a crop that failed or was abandoned. These acres should be reported as cropland acres (in 1a).
  - (3) Small grain crops planted the previous Fall, abandoned, plowed under, or grazed off. These acres will be recorded as acres cropped (in 1a).
  - (4) Permanent pasture that is not harvested for hay (in 1e)
- Record the acres planted to the nearest tenth (1/10).

**Item 1d - Fruit, nuts, citrus, nursery, greenhouse, and nursery crops?**

Include:

- (1) Fruit orchards, vineyards, nut trees, and citrus groves.
- (2) Nursery crops, turf grass, sod, and Christmas trees.
- (3) Tree nut crops (such as pecan groves).
- (4) Acres covered with greenhouses or shade structures for floriculture crops.

Exclude:

- (1) Abandoned orchards, vineyards, groves, or nut trees. These acres should be recorded as non-ag in 1f.
- Record the acres planted to the nearest tenth (1/10).

**Item 1e - Permanent pasture or hayland?**

Permanent pasture is land normally grazed by livestock. Livestock do not have to graze the land during the current year.

Include:

- (1) Permanent pasture and rangeland.
- (2) Open grassland, brush land, and browse.
- (3) Woodland used as pasture.

Exclude:

- (1) Small grains pastured or grazed.
- (2) Pasture in rotation with crops.

- Record the acres planted to the nearest tenth (1/10).

**Item 1f - Non-ag (such as dwellings, buildings, structures, roads, and woodland and wasteland not in a conservation practice)?**

Non-ag acres includes woodland, and wasteland that is not cropped and is not associated with a conservation practice such as a field buffer.

Include:

- (1) Land covered primarily in woodland or timber.
- (2) Woodland that is not grazed.
- (3) Timberland to be harvested for lumber or pulp wood.
- (4) Abandoned fruit orchards, groves, or tree nuts.
- (5) Native acres of maple trees which may be tapped for maple syrup.
- (6) Homestead, barns, grain bins, confinement livestock facilities, or any other structure.
- (7) Any acreage that is not tillable, not pastured, and not in any form of government program, or conservation practice.

Exclude:

- (1) Land diverted to government programs planted to trees.
- (2) Woodland with grazing capacity.

- Record the acres planted to the nearest tenth (1/10).

## **Item 2: Total acres in the Selected Field and Conservation Area**

Sum the acres recorded in Item 1. This total will represent the designated area of interest. The selected field will be the acreage recorded in either Item 1a and/or 1c.

Record the total acres that make up the area of interest. This should encompass the total acres drawn off on the aerial photo or map. This item should be the sum of all field utilization in Items 1a through 1f.

- Record the field acres to the nearest tenth (1/10).

**[ENUMERATOR NOTE: *If any acres reported in 1a (planted/cropped) or 1c (idle cropland, summer fallow, or pasture in rotation with crops) continue; otherwise, go to Conclusion.*]**

If any acres are reported in Item 2 are recorded in 1a (cropped) or 1c (idle cropland, summer fallow, or pasture in rotation with crops), continue the interview with the respondent.

**Remember, if none of the acres reported in Item 1 are recorded in 1a or 1c, conclude the interview.**

**Item 3: Enrollment in Continuous Conservation Reserve Program (CRP), the Farmable Wetland Program (FWP) or the Conservation Reserve Enhancement Program (CREP)**

The Conservation Reserve Program (CRP) is the country's largest private-lands environmental improvement program. The CRP is a voluntary program available to producers to assist them to enhance environmentally sensitive lands. Enrollment in CRP requires the acreage be planted in long-term resources-conserving covers such as grasses or trees to improve water quality, control soil erosion, and enhance wildlife habitat. In exchange, the producer receives annual payments for taking the land out of crop production.

Environmentally desirable land eligible and suitable for certain conservation practices may be enrolled at any time under the CRP continuous sign-up. The general CRP has a specific, limited enrollment period.

CREP is an offshoot of the continuous CRP. CREP partners federal resources with tribal and State governments and, in some cases, private groups to address high-priority conservation issues, such as impacts to water supplies, loss of critical habitat for wildlife species, and reduced habitat for fish populations.

The Farmable Wetlands Program (FWP) is a program to restore wetlands and associated buffers through improving the land's hydrology and vegetation. Producers can enroll eligible land in the FWP through the continuous CRP.

- If any portion of the conservation tract is enrolled in continuous CRP, FWP, or CREP, check the "YES" box, enter a "1" in the code box and continue.
- If none of the acres in the selected field are currently signed-up in continuous CRP, FWP, or CREP, check the "NO" box, enter a "3" in the code box and continue.

#### Item 4: Organic Acreage

Organic refers to the way agricultural products are grown and processed. Organic farming standards differ fundamentally from conventional ones in their management practices. For example, organic production is based on a system of farming that maintains and replenishes soil fertility without the use of synthetic fertilizers. Certified organic crops cannot be seeded with genetically modified seed nor treated with synthetic pesticides.

"**Certified Organic**" means the item has been grown according to strict uniform standards that are verified by independent state or private organizations.

For the purpose of the NRI CEAP, it is not necessary that the field has been certified organic. What is critical is that the field has been farmed using organic practices. This will differentiate the field from those farmed using conventional practices, and will provide different expectations for the fertilizer, manure, pesticide, and field operations tables.

#### Item 5: Land Tenure

This item is used to determine the tenure arrangement of the sampled field. This question will help determine whether production and conservation practices used for owned fields differ from those on rented fields. In most cases, the entire field will either be owned, rented or used rent free. You will record the appropriate code for the type of tenure arrangement. If the field contains acreage of different tenure types, record the code that reflects the tenure of the majority of the acres in the field.

##### INCLUDE:

- 1) Acres in the field which are owned by the operation (CODE=1).
- 2) Acres in the field for which the operator paid a predetermined fixed cash rent (CODE=2).
- 3) Acres in the field for which the operator paid a flexible cash rent (CODE=3). The cash rent may have depended upon the resulting yield, market price, or some other factor.
- 4) Acres in the field for which the operator paid the landlord a share of the crop (either standing or harvested), (CODE=4). Make sure the rental agreement specified the rental fee was to be a share of the crop grown.
- 5) Acres in the field for which the operator paid some combination of

cash and a share of the crop (CODE=5). The rent may include a fixed or flexible cash payment supplemented with a share of the crop.

- 6) Acres in the field belonging to others (private individuals, federal, state, railroad, etc.) which the operator used rent free (CODE=6). If the rental agreement specifies the landlord only receives a share of the government payments, and no share of the crop, then this should be counted as land used rent free.
- 7) Acres in the field if not operated in 2010 and 2009 (CODE=7). Not valid for 2011.

**Note:** If option 7 is selected for 2011, verify that the respondent did in fact operate the selected field in 2011 and select option 1-6 to identify the operating arrangement. **If the respondent did not operate the field in 2011, conclude the interview and locate the correct operator.**

### **Item 8: Decision-maker for this operation**

We are interested in how the operation was **managed** on a day-to-day basis. Definitions of individual, partnership, and managed land are printed in the *Agricultural Surveys Interviewer's Manual*. Landlord-tenant, cash-rent and share crop arrangements should not be considered partnerships.

- When an individual operation is reported, enter code 1 and go to Section B.
- When a partnership is reported, enter the total number of partners, including the farm operator and all of the other partners. Continue to Section B.
- When a hired manager is reported, enter code 8 and go to Section B.

## **Section B - Conservation Plan**

### **What's Section B for anyway? How is the information used?**

Section B identifies conservation programs and practices associated with the sampled field and obtains information about the written conservation plan.

All conservation practices that are in place should be considered - whether they were installed as part of a Federal or State program, a program offered by an industry or non-profit organization, or by the operator with no outside support.

Some producers may have more than one conservation plan, each associated with a different government program. In many cases, the producer will be receiving incentive payments or cost share payments for implementing these practices. We need to know whether or not payments were received in order to match environmental benefits to program costs.

More detailed information about specific practices in the conservation plans will be obtained later in the questionnaire. Additional information will also be obtained from NRCS county offices using the NRCS Supplement.

### **Item 1: Written Conservation Plan(s) for Field**

A conservation plan is a formal document customized for the individual producer that outlines in detail the overall use and best management of the natural resources on the land that they farm.

If a producer has a plan, it will have been designed to mitigate environmental impacts associated with agricultural production. Usually a plan addresses multiple fields on a farm, identifying specific practices for each field. The conservation plan describes the schedule of operations and activities needed to solve the identified natural resource problems.

In most cases, the conservation plan will be drawn up with technical assistance from NRCS or the conservation district. These plans detail practice standards as described in the NRCS Field Office Technical Guide (FOTG). In order to receive financial payments, the producer must sign a conservation program contract.

Conservation plans may also be produced through State or local government agencies, private individuals or firms (known as Technical Service Providers), or non-profit organizations.

In some States, a specific type of plan known as a nutrient management plan (NMP) may be required by law for agricultural operations of a certain size or type. Requirements vary by State. The primary purpose of the required nutrient management plan is to reduce the amount of excess nutrients that move from the land into groundwater and streams.

- Check “YES” and enter a “1” if the producer has a written conservation plan, for the selected field, and continue.
- Check DON'T KNOW and enter a “2” if the respondent is unsure if they have a written plan and go to Item 2.
- Check “NO” and enter a “3” if the producer does not have a written conservation plan for the selected field and go to Item 2 .

**Item 1a: Practices included in the Conservation Plan**

Practices that are included in a conservation plan target problem areas or specific issues. Identify the practices that are included in the conservation plan from the list provided.

- Enter a “1” for all that apply.

**Item 2: Cost share or incentive payments for conservation practices implemented on the selected field and/or conservation area.**

Ask the respondent if cost share or incentive payments were received in 2011, 2010, or 2009 for conservation practices implemented on the selected field and/or conservation area.

Cost share payments are payments received by the producer to offset the cost of establishing a particular conservation practice.

Incentive payments are usually annual payments made for a specified number of years, as stated in the conservation program contract. Incentive payments make conservation practices economically attractive to the producer.

This item can be used as a check for Item 1, “Did you have a written conservation plan?”. If the respondent reports having received cost share or incentive payments, then they likely would have a written conservation plan or contract. The respondent may not recall a written conservation plan but may remember receiving cost share and/or incentive payments for the selected field.

- Check “YES” and enter a “1” if the operator received cost share and/or incentive payments for the conservation practices implemented on the selected field. If Item 2 = 1, then Item 1 must be equal to 1. Update Item 1 if necessary then continue to Item 2a to identify which programs funded the conservation practices implemented.
- Check “NO” and enter a “3” if the operator did not receive cost share and/or incentive practices for the conservation programs implemented on the selected field and go to Item 3.

**Item 2a: Programs for Cost Share or Incentive Payment**

Payments are issued after the practice(s) are installed, and eligible costs are verified. Identify the programs that were the basis of the funding for the cost share/incentive payments. Cost share payments may come from more than one source for the same practice.

- Enter a “1” for all that apply.

### **Item 3: Assistance for Developing the Plan or Conservation Practices**

If conservation practices or a conservation plan exist for the selected field, the source of assistance to develop the plan and/or develop or install the conservation practice must be identified. Assistance includes any person or agency who helped develop or write the plan or to plan, install, or maintain a practice.

Indicate who provided assistance for the conservation plan or who provided the planning for any conservation practice implemented. It is possible to have more than one source of assistance if several practices are implemented at different times.

The options are:

- 1 - NRCS
- 2 - Conservation District
- 3 - Technical Service Providers (Private Sector)
- 4 - University Extension
- 5 - State Agencies
- 6 - Other (specify)

#### **Column 1: Source of Assistance**

- Enter a "1" for each source of assistance. If "other" is selected, do not code the box. Use the space provided to identify the source.

#### **Column 2: Charged a Fee for Assistance**

- For each source that charged the respondent for assistance, enter a "1".

#### **Column 3: Primary Source of Assistance**

Select the provider who was the primary source of assistance for the development of the conservation plan from the 6 sources.

- Enter a "1" in the corresponding cell for the primary assistance provider.

## **Section C - Cropping History and Conservation Practices**

The cropping history and conservation practices section is used to determine farming activities on the selected field, such as tillage practices, types of crops grown, use of cover crops, and livestock grazing. Crop data is used in conjunction with the machinery data collected in Section I to estimate residue levels. The resulting information is used to evaluate soil erosion losses and soil quality.

Conservation practices in use within and adjacent to the selected field are also collected in Section C. Collecting three years of cropping practices provides information needed to analyze the impact of conservation practices.

### **What's Section C for anyway? How is the information used?**

The purpose of Section C is to identify farming practices associated with the selected field that influence soil, nutrient, and pesticide losses. Some crop rotation schemes, for example, are designed to minimize nutrient loss from the field. Tillage systems, row width, and the timing of planting and harvest has a significant effect on soil erosion and nutrient loss estimates, as does the use of a cover crop during non-growing periods. Grazing of livestock can also impact soil erosion and nutrient loss.

It is also necessary to ask questions about common structural practices that the producer may have installed on the field, such as terraces, buffers, and drainage features. These practices have an effect on erosion and nutrient and pesticide loss.

All conservation practices that are in place should be considered, whether they were installed as part of a federal or State program, a non-profit organization, or by the operator with no outside help.

### **Item 1: Cropping and Tillage History**

The cropping and tillage history pages are used to collect information on land use for the past 3 crop years. Include only the acres in the selected field that was identified in Section A, Item 1 as cropped, idle cropland, or summer fallow. Record all crops grown sequentially during a single crop year, including cover crops. Include all crops from fields that are strip cropped.

Record a maximum of 3 crops for each year. Supplements should not be used for the Cropping Table unless the Vegetable Exemption applies.

**VEGETABLE EXEMPTION.** If multiple planting of short-season vegetable crop(s) are planted in the **selected field**, then only the current year of data is collected throughout the entire questionnaire. This exemption applies only if the selected field is part of a vegetable operation on a regular basis.

For **vegetable operations only**, use the vegetable supplement in place of the tables printed in the questionnaire. Vegetables have unique item codes that are included on the supplement. If vegetables are captured on the actual questionnaire tables, problems will occur when the data are summarized.

### Crop Year

The crop year appears at the top of each column. Each crop year has three columns in which to code the cropping and tillage information. For double cropping and year-round cropping (such as vegetable crops), record the crop in the proper crop year, not the calendar year.

A maximum of 3 crops should be captured. A supplement should be used only for the Vegetable Exemption.

If the crop is planted in the fall and harvested in the spring, the Crop Year = year that the crop is harvested. Record the crop on the Operations Table of the year that the crop is harvested.

Cover crops in place at the beginning of the crop year, but planted the previous year should be recorded. This includes cover crops that will be mowed, burned, plowed or disked in, or killed by herbicide application or other means, in preparation for planting of a new crop in the current year.

### Crop or Land Use

Record the crop planted or land use for each of the 3 crop years (or number of years in which the current operator farmed the selected field if less than the 3 years). Use the Respondent Booklet if necessary to find the crop or land use name.

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Include double cropping and other multiple cropping strategies for the crop year. For strip cropping, multiple strips of the same crop can be combined together on one column if all the lines in the table are the same for each strip. For example, during the 2011 crop year our targeted field has four 10 acre strips of corn, and four 10 acre strips of alfalfa. For 2011, the columns can be coded with 40 acres of corn and 40 acres of alfalfa, respectively instead of listing a total of 8 strips that are each 10 acres separately.

If a respondent has identified the field such that more than one crop is grown at the same time in the field, only report one of the crops (i.e. nurse crop). **(NOTE: This does not apply to strip cropping.)** Select the crop with the most acreage whenever multiple crops are grown simultaneously in the selected field. This can occur if a single crop was grown in the field in 2011, but the field was split into 2 crops in a prior year. In all subsequent sections of the questionnaire, data collected should reflect only the selected crop.

When strip cropping occurs, all crops grown simultaneously in the selected field must be reported. Each individual strip should NOT be reported as an independent field within the selected field. For each crop planted as part of the conservation practice of strip cropping, the total acres in the strip should be reported as one lump sum if each strip of that crop was treated exactly the same.

Record crops if they were **planted** during the time period, even if the crop was abandoned before harvest because of drought, hail, or some other event.

If the field was replanted to the original crop, record only the information pertaining to the replanted crop throughout the survey. (In Section I, Field Operations record the information pertaining to all planting and replanting activities.) If only a portion of the field was replanted, record the information for the crop with the most acres throughout the survey.

Include any multi-year crop(s) (eg. alfalfa, other hay or pasture in rotation with crops) even if the planting date occurred in a previous year.

**Line 1: Crop or Land Use Code**

- Enter the crop code from the Respondent Booklet for each crop or land use recorded in the space above Line 1.

**Line 2: Intended Use Code**

Valid intended use codes include:

- 1 = Dual (grain/grazing)
- 2 = Grain
- 3 = Grazing only
- 4 = Cover crop
- 5 = Other (specify)
- 6 = Hay
- 7 = Human consumption (eg: cotton, tobacco, vegetables)
- 8 = Silage/haylage
- 9 = Seed only
- 10 = Nurse crop
- 11 = Biofuels

- Enter the intended use codes for each crop or land use recorded in Line 2.

### Line 3: Acres Planted

Record the number of acres planted in each of the crop years to the nearest tenth (1/10). If idle land, summer fallow, or pasture in rotation with crops is reported, record the number of acres of the reported land use.

Crops that are planted but harvested over several years should also be included in Line 3. Examples of previous planted crops include alfalfa and sugarcane.

For crops with permanent planting, such as a hay crop, record the number of acres for each crop year that this crop is grown, regardless of the year when it was planted.

- Record crops if they were **planted** during the time period, even if the crop was abandoned before harvest because of drought, hail, or some other event.

**Note:** If the land was **idle**, code the number of acres in the field, and skip Lines 4 through 6a and Lines 8 through 10.

### Line 4: Planting Date

Reference the calendar located in the Respondent Booklet. Record the month, day, and year the crop was planted in the selected field (MMDDYY).

If the field was replanted to the same crop, record only the information pertaining to the replanted crop throughout the survey. If only a portion of the field was replanted, record the information for the crop with the most acres throughout the survey.

If planting in the selected field occurred over several days, select the day that represents the approximate time when at least one-half of the field was complete. For example, a producer planted approximately one-third of the soybeans in the selected field on May 29 and finished up the planting of the field on June 1, 2011, because of a delay, record the month planted as 060111 (June).

Refer the respondent to the calendar provided in the Respondent Booklet to assist in remembering the approximate planting date. From an agronomic

standpoint, there can be huge changes from the beginning of the month to the end of the month. The respondents' best guess on timing of planting is more accurate than just identifying the month.

- Record month, day, and year, in digits. For example, June 1, 2011, will be entered as 0 6 0 1 1 1.

**For crops previously planted, leave this line blank.**

### **Line 5: Row Width (Inches)**

Some crops are planted in a continuous straight line. Rows are evenly spaced to facilitate mechanical cultivation and harvest operations. The row width (or row space) is the distance from the center of one row to the center of the next row. Examples of traditional row crops are corn, cotton, soybeans, vegetables, and tobacco.

If the respondent used a drill to plant the crop (small grains, soybeans, etc.), the row width is not necessary but can be reported.

- Enter the row width in inches to the nearest tenth (1/10) if the crop was planted in rows. Record row width regardless of crop type.

**For crops previously planted, leave this line blank.**

### **Line 6: Expected Yield (Yield Goal)**

Producers have certain expectations for crop yields when making decisions to plant. Nutrient applications are based on their expected yield or yield goal. It may be different from the actual harvested yield captured on Line 9. Knowing the yield goal can also help NRCS identify unusual crop years (drought, flood, etc.) by providing a comparison to the actual yield.

**HAY:** For hay crops, record the expected total yield per acre for the entire year. For example, if 3 cuttings are expected and each cutting is expected to yield 1.5 tons per acre, then the expected total yield for hay is 4.5 tons per acre.

- Record the operators' expected yield at the time that the planting decisions were made. Record the expected yield per acre to the nearest tenth (1/10) of a unit on line 6 and the unit code on line 6a.

### **Line 6a: Yield Unit**

Valid codes for the yield per acre units are:

- 1 = Pounds
- 2 = Cwt [hundredweight, 100 pounds]
- 3 = Tons
- 4 = Bushels
- 5 = Other (specify)
- 6 = Barrels
- 23 = 50-lb bag

Enter the appropriate unit code that describes the yield in line 6.

If a producer indicates a yield unit that is not listed for 6a, make notes that will assist the Field Office assigning a correct item code. For example, a producer expected a cotton crop of 2.5 bales per acre (average bale = 480 lbs), record 2.5 on line 6 and specify bales on line 6a.

Yields for grain hay should be reported in either pounds or tons. Notes may be needed to record a particular yield unit that is not listed on line 6a.

### Line 7: Type of Tillage

Cultivation, or tillage, of soil is integral to the process of raising most crops. The amount of cultivation varies with the tillage system. Conventional tillage consists of tilling fields up to several times per year to prepare fields for planting and to control weeds after the crop has emerged. Little crop-plant residue remains on the surface of the soil during the growing season. Conservation tillage or minimum tillage is any tillage and planting system that maintains residue on the soil surface after planting. Minimum tillage reduces soil and wind erosion and enhances soil quality. Types of conservation tillage are no-till, ridge-till, and mulch-till.

Record the type of tillage used on the selected field for each crop during the crop years. The options for coding this line are:

**1 No-till, Strip-till (Direct Seed)**

No-till is a tillage system in which crop residue is left on the soil surface. The soil is left undisturbed from prior harvest, except for no-till planting and nutrient application. Strip tillage combines the benefits of no-till and full-width tillage. Tillage is confined to 6 to 8 inch strips into which dry fertilizer and/or anhydrous ammonia and seed are placed. Loosened soil in the strips creates a ridge or berm 3 to 4 inches high, which settles down to 1 to 2 inches by spring planting. Crop residue in row middles is left undisturbed, satisfying the USDA definition of “no-till.”

No till is sometimes referred to as “zero till” or “direct seed” in some regions of the country.

**2 Ridge-till**

Ridge-till leaves the soil undisturbed from harvest to planting except for strips up to 1/3 of the row width. Planting is completed on the ridge and usually involves the removal of the top of the ridge. Residue is left on the surface between the ridges. Ridges are rebuilt during cultivation. Ridge till is sometimes referred to as plant-till.

**3 Mulch-till**

Mulch-till is a full-width tillage system that disturbs the whole soil surface prior to and/or during planting but leaves residue cover.

There are a wide variety of specific tillage techniques that fall in this category. If a respondent says they are using minimal till or conservation tillage and it is **not** no-till or **not** ridge-till, then record it as mulch-till.

**4 Conventional till**

Full width tillage system which disturbs all of the soil surface and is performed prior to and/or during planting. Conventional tillage systems leave minimal residue cover at planting.

- Enter the appropriate code that describes the type of tillage practices used on this selected field.

**For crops with permanent planting(s), such as hay, leave this line blank.**

**Type of tillage for previously planted crops (i.e. alfalfa, sugarcane) should be recorded.**

**Line 8: Acres Harvested**

Acres harvested are usually the entire field unless some portion of the field was not harvested during the crop year.

**Note:** Record the acres cut for hay only one time. Multiple harvest of the same acres will be captured in the total production recorded as harvested yield.

- Record the acres harvested (and remaining to be harvested at the time of the interview.)

**A blank signifies that NO HARVEST occurred.**

**Line 8a: Date Harvested**

Refer the respondent to the calendar provided in the Respondent Booklet to assist in remembering the approximate harvest date. From an agronomic standpoint, there can be huge changes from the beginning of the month to the end of the month. The respondents' best guess on timing of harvest is more accurate than just identifying the month.

Record the month, day and year each crop on the selected field was harvested or expected to be harvested. For crops that have multiple harvesting dates, such as hay crops, record the date of the last harvest of the crop year.

In the case of small grains, the harvest date reported on line 8a should represent the grain harvest, not the stubble harvest.

- Record month, day, and year in digits. For example, October 23, 2011, will be entered as 1 0 2 3 1 1.

**A blank signifies that NO HARVEST occurred.**

### **Line 9: Harvested (Actual) Yield per Acre**

If the selected field has been harvested, record the yield per acre for the specific crop and crop year. Record the yield per acre to the nearest tenth (1/10) of a unit on line 9 and the unit code on line 9a.

Actual harvested yield per acre should be recorded for the crops listed on line 1. If harvest of the selected field is not complete, ask the operator to estimate the yield per acre expected at harvest.

- Record the actual yield (or estimated yield if not yet harvested) at the time that the interview is conducted. Record the yield per acre to the nearest tenth (1/10) of a unit on line 9 and the unit code on line 9a.

- For crops with permanent planting(s) but multiple harvests, such as hay crops, record the total tons per acre harvested during the crop year.

**A blank signifies that NO HARVEST occurred.**

### **Line 9a: Yield Unit**

If a producer indicates a yield unit that is not listed for 9a, make notes that will assist the Field Office in assigning a correct item code. For example, a producer expected a cotton crop of 2.5 bales per acre (average bale = 480 lbs), record 2.5 on line 9 and specify bales on line 9a.

Yields for grain hay should be reported in either pounds or tons.

Valid codes for the yield per acre units are:

- 1 = Pounds
- 2 = Cwt [hundredweight, 100 pounds]
- 3 = Tons
- 4 = Bushels
- 5 = Other (specify)
- 6 = Barrels
- 23 = 50-lb bag

- Enter the appropriate unit code that describes the yield in line 9.

**A blank signifies that NO HARVEST occurred. For crops with permanent planting(s) (i.e. new alfalfa seeding) and are/were not harvested, leave this line blank.**

### **Line 10: Acres Abandoned**

- Record the number of acres abandoned or not harvested during the crop year. This applies only to acres that were listed on line 3 (planted). Do not include hay acres or fallow acres.

**A blank signifies that no acres were abandoned. For crops with permanent planting(s), leave this line blank. If acres in Line 9 (harvested acres) is less than acres in Line 3 (planted acres), enter difference between planted and harvested in Line 10.**

**Line 11: Crop Irrigated**

Ask if each crop reported was irrigated during the specific growing season. The crop should be counted as irrigated if any of the acres in the field had water **applied at least once during the growing season**, or if the acres were **irrigated before planting**.

- Enter a “1” for “YES” for each crop that was irrigated. Otherwise enter a “3” for “NO”.

**Line 12: Straw/Stubble Harvested**

- If straw or stubble was harvested from the selected field, enter code “1” for “YES” and continue with Item 11a and 11b. Otherwise, enter code “3” for “NO” and go to line 12.

**Does not apply for crops with permanent planting(s), such as hay.**

**Line 12a: Acres Harvested**

- Record the number of acres harvested for straw or stubble.

**Does not apply for crops with permanent planting(s).**

**Line 12b: Remaining Stubble Height (Inches)**

- Record the remaining stubble height after harvest in inches.

**Does not apply for crops with permanent planting(s).**

**Line 13: Grazing**

- If livestock grazed the selected field, enter a “1” for “YES” and continue with lines 14 - 16, otherwise enter a “3” for “NO” and skip Items 14, 15, and 16.

**Line 14: Type of Livestock Grazed**

Valid codes for types of livestock are:

- 1 = Cattle
- 2 = Sheep
- 3 = Goats
- 4 = Horses
- 5 = Other (specify)

- Record the code for the type of livestock that grazed the selected field. If more than one type, identify the primary type of livestock that grazed the selected field.

**Line 15: Head Grazed BEFORE Harvest**

- Regardless of ownership, record the average number of head of livestock that grazed the selected field BEFORE harvest and continue to line 15a.

If livestock DID NOT graze this selected field BEFORE harvest, go to page 7.

**Line 15a: Days Grazed BEFORE Harvest**

- Enter the total number of days the selected field was grazed BEFORE harvest.

**Line 15b: Supplemental Feed**

- Enter a "1" for "YES" if the livestock reported on line 13 were supplied supplemental feed while they were grazing this field.

**Line 16: Head Grazed AFTER Harvest**

- Regardless of ownership, record the average number of head of livestock that grazed the selected field AFTER harvest and continue to line 15a.

If livestock DID NOT graze this selected field AFTER harvest, go to line 16.

**Line 16a: Days Grazed AFTER Harvest**

- Enter the total number of days the selected field was grazed AFTER harvest.

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## Line 16b: Supplemental Feed

- Enter a “1” for “YES” if the livestock reported on line 13 were supplied supplemental feed while they were grazing this field.

## How to Record Replanting in the Tillage Table

Often situations will result in a farm operator having to replant a crop or plant a different crop when weather related events (i.e. drought, hail, flood) destroy the first crop. Both crops should be captured in the Tillage Table. The example below shows how the first 10 lines of the table would be completed when the cotton crop destroyed by hail and soybeans were planted as a replacement crop.

### Example: Cotton Hailed out, Soybeans Replanted

Let's begin with the 2011 crop year. What was the:		2011	2011	2011
Crop(s) planted or Land Use _____ ?	<b>Crop</b>	upland cotton	soybeans	
1. Crop(s) code or Land Use Code. <i>[See Respondent Booklet for codes].</i>	<b>Code</b>	1005 281	1037 26	1069
2. Intended use of Crop(s)? <i>[See Respondent Booklet for codes].</i>	<b>Code</b>	1006 7	1038 2	1070
3. Acres planted? <i>[Include previous planted crops.]</i>	<b>Acres</b>	1007 189.0	1039 189.0	1071
4. Date planted? (mmddyy)	<b>Date</b>	1008 040111	1040 070111	1072 -----
5. Row Width (for row crops)?	<b>Inches</b>	1011 30.0	1043 30.0	1075
6. <b>Expected</b> yield/acre at planting (yield goal)?	<b>Number</b>	1012 950.0	1044 35.0	1076
a. Unit: <i>[See Respondent Booklet for codes].</i>	<b>Code</b>	1013 1	1045 4	1077
7. Type of tillage used? 1 = no till, strip till (direct seed) 2 = ridge till (Select from list.) 3 = mulch till 4 = conventional till	<b>Code</b>	1014 4	1046 4	1078
8. Acres harvested?	<b>Acres</b>	1015 ---	1047 189.0	1079
a. Date harvested? (mmddyy)	<b>Date</b>	1016 ---	1048 101111	1080 -----
9. <b>Actual</b> yield at harvest/acre?	<b>Number</b>	1017 ----	1049 28.0	1081
a. Unit: <i>[See Respondent Booklet for codes].</i>	<b>Code</b>	1018 ----	1050	1082
10. Acres abandoned?	<b>Acres</b>	1019 189.0	1051	1083

## Item 2: Crop Rotation

Crop Rotation is defined as growing crops in a repeating sequence on the same land. Rotations are for two or more years. Planned rotations are often part of a conservation plan, but they are also in common use where there is no conservation plan.

Application of a crop rotation practice is used to improve or maintain good physical, chemical, and biological conditions of the soil; help reduce soil erosion; improve water use efficiency; manage plant pests (weeds, insects, diseases); provide food for domestic livestock; and/or provide food and cover for wildlife.

- Record a “1” for “YES” if a crop rotation plan is used on the selected field and continue. If “NO”, enter a “3” and go to Item 3.

### Item 2a: Cropping Pattern of Field

A planned crop rotation is a reoccurring pattern of crop plantings. Ask the respondent which cropping pattern best represents the crop rotation plan for the sampled field.

Note: Use as many lines as years in the rotation (**i.e. all lines do not have to be completed**).

In most cases, crop rotations involve changing the crop from year to year. For example, a producer may have a two year crop rotation pattern of corn one year, and soybeans the next. This pattern would be repeated in subsequent years.

For planned crop rotations, record the crops and crop codes in the rotation. Record only the number of years needed. If a crop rotation pattern is more than six years, make notes of the crops in the pattern after year 6 so the survey statistician can code the extra years.

If hay or pasture is in rotation with crops, record the rotation from the time that hay or pasture was established to when it was plowed under to convert to a crop.

Include a double cropping system if it is followed in a planned crop rotation pattern. Cover crops may also be part of a planned rotation. For example, if a producer plants a soybean-winter wheat double crop pattern in year one, and sorghum in year two, record both the soybean-wheat crop name and crop code for year one.

Use the 2<sup>nd</sup> and 3<sup>rd</sup> columns to record double cropping and/or cover crops that are part of a planned rotation.

- Record all applicable crop codes in the corresponding line.

### **Item 3: Cover Crop**

Cover crops are crops planted to increase soil structure and fertility, maintain water quality, and sometimes, to reduce weeds, pests, or diseases in crop fields. Cover crops reduce soil erosion by providing a physical barrier on the soil surface and underground through their root network. As a result, soils and plant nutrients are retained and recycled and not discharged into streams through runoff or leaching. Farmers choose to grow specific types of cover crops based on their own goals and objectives. The use of cover crops has been encouraged in recent years, as a means to provide protection for the soil during the winter months.

Winter cover crops are planted in the fall after harvest of the previous year's crop, and is killed back just prior to spring planting by mowing, burning, plowing or disking in, applying a herbicide, or other means.

#### **Item 3a: Cover Crop History**

Record the following items for any year(s) between 2009 and 2011 that a cover crop was planted on the selected field. Winter cover crops should be recorded as a "crop" in the year that it was terminated.

##### **Item 3a(i) Date planted**

Refer the respondent to the calendar provided in the Respondent Booklet to assist in remembering the approximate planting date. The respondents' best guess on timing of harvest is more accurate than just identifying the month.

Record the month, day and year the cover crop on the selected field was planted.

- Record month, day, and year in digits. For example, October 23, 2011, will be entered as 1 0 2 3 1 1.

### **Item 3a(ii) Type of cover crop planted**

Wheat, rye, and other small grains are often planted as cover crops to control soil erosion and maintain water quality. Other types of cover crops may also be planted, for example various types of legumes.

### **Item 3a(iii) Date terminated**

Refer the respondent to the calendar provided in the Respondent Booklet to assist in remembering the date the cover crop was terminated.

- Record month, day, and year in digits. For example, October 23, 2011, will be entered as 1 0 2 3 1 1.

### **Item 3a(iv) How terminated**

Valid codes for method of termination are:

- 1 = Herbicide
- 2 = Mowed
- 3 = Hayed
- 4 = Plowed or disked in
- 5 = Roller/Crimper
- 6 = Harvested for grain
- 7 = Burned

## **Item 4: Adjacent to a Water Body**

Field runoff and leaching have more of an impact when a source of water, either moving or non-moving, is located next to the field. If the sampled field touches a waterbody, including a lake, pond, river, stream (including ephemeral or intermittent stream), wetland, or man-made drainage ditch

or channel, runoff from the field may carry materials directly into the adjoining water.

Systems of conservation practices for these fields are designed to meet a higher standard than conservation systems for other fields.

- If a moving or non-moving body of water is adjacent to the sampled field code a “1” for “YES” and continue.

### **Item 5: Subsurface (Tile) Drainage**

Agricultural drainage is the removal of excess water from the field, by either gravity or artificial means. *Subsurface or tile drainage* is designed to remove excess water *from the soil profile*. The water is drained through a series of perforated drainage pipes (tile or plastic tubing) that are installed below the soil surface. Subsurface drainage pipes are typically installed at a depth of 30 to 40 inches, and at a spacing of 20 to 80 feet. A subsurface drainage network for a field generally outlets to an open ditch or stream.

- Enter a “1” for “YES” if a subsurface (tile) drainage system is used in the field.

### **Item 6: Surface Drainage Structures**

A *channel or diversion (ditch) drainage system* is designed to remove standing water *from the soil surface*. A ditch drainage system involves the construction of open ditches within and/or around the field perimeter to catch and direct the flow of excess surface water.

- Enter a “1” for “YES” if a surface drainage structure is in the sampled field.

## Item 7: Conservation Practices

The presence of structural conservation practices have an impact on soil and chemical loss from agricultural fields. To obtain the required information, you will ask if certain practices were established.

Determine whether the land use practices in Items 7a-p were used on the selected field and/or conservation area during 2011. Use Item 7q to record any other land use practices not listed. The operator may use more than one of the practices listed. Include all structural practices, whether they were part of a conservation plan or not. Enter acres of each practice present.

**Note:** Conservation Practices included in Item 7 may not be traditionally recorded as acres. However, for purposes of this survey, identifying the corresponding acres that these practices cover in the selected field is the objective of the question. Most respondents will be familiar with the amount of acres that is no longer available to be cropped when converted to conservation use.

### Item 7a: Terraces

Terraces are earth embankments, channels, or a combination ridge and channel constructed across the slope to intercept runoff water. Terraces break long slopes into shorter ones. As water makes its way down a hill, terraces serve as small dams to intercept water and guide it to an outlet.

- Determine if the selected field has terraces. If “YES”, enter “1”.

#### Item 7a(1) Type of Terrace

Ask the respondent if the terraces in 2011 were:

Code 1 = primarily grassed  
Code 2 = primarily cropped

- Record the code in the corresponding cell.

### **Item 7b: Stream Side (Riparian) Forest Buffer**

A stream side forest buffer (or riparian forest buffer) is an area of trees and shrubs located adjacent to a body of water, including streams, lakes, ponds, sinkholes, and wetlands.

Stream side forest buffers intercept sediments, nutrients, pesticides, and other materials in surface runoff and reduce nutrients and other pollutants in subsurface water flow. Woody vegetation also provides food and cover for wildlife, and slows out-of-bank flood flows.

- If stream side forest buffers exist, enter “1” for “Yes” and continue. If “No”, skip to Item 7c.

#### **Item 7b(i) Width of Buffer**

- Record the width of the buffer to the nearest foot.

#### **Item 7b(ii) Species**

- Indicate the primary type of vegetation planted in the buffer. Valid codes for species are:

- 1 = Evergreen trees and shrubs
- 2 = Deciduous trees and shrubs
- 3 = Mixed evergreen and deciduous trees and shrubs

### **Item 7c: Stream Side (Riparian) Herbaceous Buffer**

A stream side herbaceous buffer (riparian herbaceous buffer) is an area of herbaceous cover established adjacent to a body of water, including streams, lakes, ponds, and wetlands. The vegetation includes grasses, sedges, rushes, ferns, legumes, forbs, and other non-woody vegetation that is tolerant of intermittent flooding.

Stream side herbaceous buffers intercept sediment, nutrients, pesticides, and other materials in surface runoff and reduce nutrients and other pollutants in subsurface water flow. They also provide food and cover for wildlife.

- If stream side herbaceous buffers exist, enter “1” for “Yes” and

continue. If “No”, skip to Item 7d.

#### **Item 7c(i) Width of Buffer**

- Record the width of the buffer to the nearest foot.

#### **Item 7c(ii) Buffer Maintenance**

- If the buffer is actively maintained by mowing, fertilizing, and/or repairing gullies, enter “1” for “Yes”.

#### **Item 7c(iii) Buffer Design**

Buffers are designed for specific objectives, such as to capture sediment, nutrients, and/or pesticide residues. Their construction will vary based on these objectives .

- Enter “1” for “Yes” for all items the buffer is designed to address.

### **Item 7d: Field Borders**

A field border is a strip of perennial vegetation established at the outside edge or around the perimeter of a field. Field borders may be used with contour farming, terrace, buffer strip and contour strip cropping systems. The vegetation in the strip protects field edges from soil erosion and provides turning and travel lanes around the field.

- If field borders exist, enter “1” for “Yes” and continue. If “No”, skip to Item 7e.

#### **Item 7d (i) Width of Border**

- Record the with of the border to the nearest foot.

### **Item 7d (ii) Border Maintenance**

- If the border is actively maintained by mowing, fertilizing, and repairing gullies, enter “1” for “Yes”.

### **Item 7d (ii) Border Design**

Field borders are designed for specific objectives, such as to capture sediment, nutrients, and/or pesticide residues. Their construction will vary based on these objectives.

- Enter “1” for “Yes” for all items the buffer is designed to address.

## **Item 7e: Filter Strips**

A filter strip is an area of permanent vegetation established for the purpose of removing sediment, organic material, and other contaminants from field runoff. Filter strips slow the velocity of water, allowing suspended soil particles and soluble pollutants to settle out and infiltrate the ground. Pollutants will be absorbed on soil and plant surfaces or taken up as soluble substances by plants.

- If filter strips exist, enter “1” for “Yes” and continue. If “No”, skip to Item 7d.

### **Item 7e(i) Width of Filter strip**

- Record the width of the filter strip to the nearest foot.

### **Item 7e(ii) Filter strip Maintenance**

- If the filter strip is actively maintained by mowing, fertilizing, and repairing gullies, enter “1” for “Yes”.

### **Item 7e(iii) Filter strip Design**

Filter strips are designed for specific objectives, such as to capture sediment, nutrients, and/or pesticide residues. Their construction will vary based on these objectives.

- Enter “1” for “Yes” for all items the filter strip is designed to address.

**Item 7f: Grassed Waterways**

Grassed waterways are natural or constructed water drainage channels in a field. Often they have been shaped or graded, and a permanent cover of vegetation has been established.

Include waterways that are used as outlets for terraces and for disposing of runoff from diversion channels, stabilization structures, contoured rows, and natural depressions.

- If grassed waterways exist, enter "1" for "Yes".

**Item 7g: Vegetative Barriers**

Vegetative barriers are narrow, permanent strips of dense, tall, erect perennial vegetation established across the dominant slope of the field. These vegetative barriers slow runoff, and trap sediment, pesticides, and other potential pollutants.

- If a vegetative barrier exists, enter "1" for "Yes".

**Item 7h: Hedgerow Plantings**

A hedgerow planting involves establishing vegetation in a dense row at the edge of a field. The purpose of a hedgerow planting is to delineate field boundaries, serve as fences, establish contour guidelines, provide wildlife cover, provide screens, or improve the landscape.

- If hedgerow planting exists, enter "1" for "Yes".

**Item 7i: Windbreak**

Windbreaks are rows of coniferous trees or a combination of coniferous and deciduous trees planted to protect a farmstead or feedlot from wind and blowing snow. Windbreaks can also be planted to reduce wind speed in open fields.

- If windbreak exists, enter "1" for "Yes".

**Item 7j: Herbaceous Wind Barrier**

Herbaceous wind barriers are narrow strips of grass or other non-woody species established at designated intervals across the field and perpendicular to the prevailing wind direction.

- If herbaceous wind barrier exists, enter "1" for "Yes".

**Item 7k: Contour Buffer Strips**

Contour buffers are narrow strips of permanent vegetation established across the hill slope and alternated with wider strips of cultivated cropland. Contour buffer strips slow water runoff and trap sediments.

- If contour buffers exist, enter "1" for "Yes".

**Item 7l: Critical Area Planting**

Critical area plantings involve establishing vegetation on eroding or denuded areas that require extraordinary treatment to get vegetation established and maintained. The vegetation provides surface cover to stop the splash from rain drops and slow water flow.

Critical area plantings reduce soil erosion, improve water quality by reducing the amount of sediment, nutrients, and chemicals, and provide small areas of nesting cover for birds and small animals.

- If critical area planting exists, enter "1" for "Yes".

**Item 7m: Grade Stabilization Structure**

A grade stabilization structure, or grade control structure, is an earthen, wooden, concrete, or other structure built across a drainage way. The structure drops water from one stabilized grade to another and prevents gullies from advancing.

Grade stabilization structures are often used at the outlet of a grassed waterway to prevent erosion. Structures can be constructed to store water in order to provide a water source and habitat for wildlife.

- If grade stabilization structures exist, enter "1" for "Yes".

### **Item 7n: Drainage Water Management**

Drainage water management is the practice of using water control structures to manage water discharged from surface and/or subsurface drainage systems. The structures are designed to be raised and lowered during the growing season to limit or reduce the flow of pollutants to ditches and streams.

- If drainage water management structures are present, enter “1” for “Yes”.

### **Item 7o: Contour Farming**

Contour farming is when producers perform tillage operations and plant crop rows by following the natural contours of the land, across the hill slope. Furrows and crop rows across the slope help slow water flow so that it can seep into the soil, instead of running off and taking loose topsoil with it. On more steeply sloped fields, contour farming is used with terraces to control erosion.

Determine if the operator used contour farming at any time in the selected field during the 2011, 2010, or 2009 crop years.

- If “YES”, enter a code “1” if contour farming was applied and continue.

### **Item 7p: Strip Cropping**

Strip cropping is growing different crops in a systematic alternate arrangement planted across the slope of the land. The purpose of strip cropping is to reduce soil erosion by wind and water. Strip cropping can include multiple crops, and may include winter cover crops on some strips.

If strip cropping was used, line 3 in Item 1 would show that multiple crops were grown simultaneously in the selected field and what portion of the field was planted to each crop.

Determine if the operator used strip cropping at any time in the selected field during the 2011, 2010, or 2009 crop years.

- If “YES”, enter a code “1” if strip cropping was in place and continue.

**Item 7q: Other (Specify)**

Identify any other structural land use practices.

- Enter a code “1” for “Yes” in the box if other types of structures exist. Write the name of the structure in the space provided.

**Item 8: Conservation Practices Implemented to Improve Field or Wildlife Habitat**

Conservation practices often enhance wildlife habitat, whether by design or not. Ask the respondent if any conservation practices were modified or added to the selected field **specifically** to improve the quality of fish or wildlife habitat.

- If “YES”, check box and enter “1”. If “NO”, check box and enter a code “3”, and go to Item 9.
- If the respondent did not have any conservation practices in place on the selected field, enter a code “4” for “Not Applicable” then go to Item 9.

**Item 9: Management of Vegetative Cover**

Vegetative cover, as part of a conservation practice, may be managed to co-exist with wildlife. An example of such management practices would be delaying mowing until after critical bird nesting period

Ask the respondent if vegetative cover was managed **specifically** for wildlife purposes.

- If “YES”, check box and enter “1”. If “NO”, check box and enter a code “3” then go to Section D.
- If the respondent did not have any conservation practices in place on the selected field, enter a code “4” for “Not Applicable” then go to Section D.

## Section D - Commercial Fertilizer Applications

### What is Section D for? How is the Information Used?

The purpose of this section is to identify fertilizers and nutrients used on the selected field for the 2011, 2010, and 2009 crop years. Fertilizer application data are used to analyze water quality and agricultural productivity issues and policies. NRCS will use this section to estimate commercial fertilizer losses from farm fields.

Nutrient management practices help farmers adjust fertilizer application to crop needs and reduce losses to the environment. Legume production, storage and use of livestock and poultry manure, and soil, plant, and tissue testing are part of the information needed in order to compute nutrient balances that establish the basis of sound nutrient management.

Year specific tables for fertilizer applications are included for the 2011 survey. Each year should be captured on the year specific table. Use the fertilizer supplement if additional lines are required to capture all the fertilizer applications. Please note that supplements should also be year specific.

### Use of Supplements

You will use a FERTILIZER SUPPLEMENT if more lines are needed to record fertilizer applications than the number of lines available in the table.

Copy the identification number as it appears on the questionnaire to the identification box on the supplement. For example in 2011, if a supplement is used, then assign the next year specific Table number (101, 102, 103, etc.) to each additional supplement used. You begin numbering the supplements with Table 101 because Table 100 appears in the questionnaire for the 2011 fertilizer applications. Use as many supplements as you need.

**Item 1a, c, e: Screening for Fertilizer Applications**

Determine if commercial chemical fertilizers (nitrogen, phosphate, potassium, sulfur) were applied to the sampled field for the 2011, 2010, and/or 2009 crop years.

- For each year ask if any commercial fertilizers were applied, enter Code “1” for “YES” and continue.
- If “NO”, enter Code “3”.

If fertilizer was not applied in any of the 3 years, then go to Question 2.

**Include:**

- all chemical fertilizer materials applied specifically for the 2011, 2010, or 2009 crop years,
- fertilizer applied in the fall if no crop was grown,
- fertilizer applied during the summer if the selected field was fallow in that year,
- fertilizers applied by custom applicators,
- nitrogen products applied with herbicides to make the herbicide more effective,
- fertilizers included in tank mixes of pesticides reported in Section F.

**Exclude:**

- micro-nutrients, such as iron, zinc, and boron,
- lime and gypsum,
- commercially prepared manure products (These applications will be report in Section E),
- unprocessed manure produced and used on the operation or received from another farm operation. (These applications will be reported in Section E.)

**[Enumerator Action: If commercial fertilizers were applied to the selected field in any of the 3 crop years, continue. If no commercial fertilizers were applied to the selected field in any year, skip to Section E.]**

### **Item 1b, d, f: Use of Product to Slow Breakdown of Nitrogen**

Nitrogen is taken from the soil by the crop, but there is also nitrate loss through leaching, runoff, and soil erosion. Two groups of soil bacteria rapidly oxidize  $\text{NH}_4$  (ammonium form of nitrogen) to  $\text{NO}_3$  (nitrate form of nitrogen) in warm, aerated soils. This process is called nitrification. While crops can uptake either form of nitrogen (N), the  $\text{NO}_3$  form is much more mobile and considered a significant contaminant to water. There are a number of nitrification inhibitor products available which slow down the transformation of  $\text{NH}_4$  to  $\text{NO}_3$ .

If fertilizer was applied, then ask:

- For each year if any products were used to slow the breakdown of nitrogen, enter Code "1" for "YES" and continue.
- If "NO", enter Code "3".

### **Item 2: Elevated Soil Phosphorus Level**

Some soils have unusually high levels of soil phosphorus, often due to the application of manure over many years. If excess phosphorus is discharged into nearby streams, this may cause water quality problems related to excess growth of algae and aquatic plants.

In some localities, nutrient management regulations prohibit additional application of phosphorus nutrients once soil phosphorus levels reach a certain threshold. A soil test will measure the amount of phosphorus in the soil, and some soil tests also provide a phosphorus "index" value.

- If a soil test has been performed which indicates the soil phosphorus level is elevated to a point where no additional phosphorus can be applied for the 2011 crop year, enter a "1" for "Yes" in the box.

### **Item 3: Phosphorus Applications**

Some manures in particular, contain such an abundance of phosphorus that they can supply the crop needs for the nutrient for multiple growing seasons. Multi-year phosphorus application (also known as phosphorus

nutrient banking) is a practice whereby phosphorus is applied (either as manure or commercial fertilizer) at rates in excess of the phosphorus requirements of the current year's crops. In subsequent years, no phosphorus is applied until the amount applied in the single year has been removed through plant uptake and harvest.

It is important to record whether phosphorus nutrients were applied prior to 2009 in order to properly account for all of the nutrients needed for the current crop rotation.

- If phosphorus nutrients were applied as either manure or fertilizer in excess of the amount needed (phosphorus nutrient banking), check the box and enter a "1" for "Yes". If not, check the box and enter a "3" for "No".

### **Item 3a: Date applied**

Record the approximate month, day and year the phosphorus nutrients were applied to the selected field.

- Record month, day, and year in digits. For example, October 23, 2011, will be entered as 1 0 2 3 1 1.

### **Item 3a: Rate applied**

- Record the amount and unit applied.

Valid unit codes for fertilizer are:

18 = Pounds per acre  $P_2O_5$

Valid unit codes for manure are:

1 = Pounds

3 = Tons

12 = Gallons

14 = Acre-inch manure per acre

#### **Item 4: Soil Test Performed**

Soil tests measure the amount of nutrients, such as nitrogen, phosphorus, and potassium that are present in the soil and available for crop uptake.

- If a soil test has been performed on the sampled field within the last 5 years to determine crop nutrient needs, check the “YES” box, enter a “1” in the cell and continue to Item 4a.

If “NO”, check the “NO” box, enter a “3” in the cell and skip to Item 5.

#### **Item 4a: How Often Performed**

Record how often the producer normally has a soil test conducted on the selected field.

Valid unit codes for manure are:

- 1 = Annually
- 2 = Every 2-3 years
- 3 = Once during the rotation

#### **Item 4b: Soil Test Results**

Provide the information for the last soil test performed on this field. If separate soil tests were conducted for nitrogen and phosphorus, provide the information for both tests. The information should be read from the soil sample test report.

#### **Item 4b(1): Year of Test**

Record the year the soil test was conducted on the selected field.

- Record the year in four digits. For example, 2011, will be entered as 2 0 1 1.

**Item 4b(2): Crop Name**

Typically, soils are tested with a particular crop in mind, as different crops have different nutritional needs. If no target crop is listed on the soil test results, make a note.

- Record the target crop as stated on the soil test.

**Item 4b(3): Crop Code**

- Enter the crop code for the crop listed in Item 4b(2). Use the crop codes listed in the Respondent Booklet to complete Item 4b(3).

**Item 4b(4): Soil Test Nitrogen**

- Record the soil test value for nitrogen and the unit of measure for this value.

Valid unit or measure codes are:

- 1 = Pounds per acre
- 2 = Parts per million (ppm)

**Item 4b(5): Soil Test Phosphorus**

- Record the soil test value for phosphorus and the unit of measure for this value.

Valid unit or measure codes are:

- 1 = Pounds per acre
- 2 = Parts per million (ppm)
- 3 = milligrams per kilogram (mg/kg)

#### **Item 4b(6): Soil Test Potassium**

- Record the soil test value for potassium and the unit of measure.

Valid unit or measure codes are:

- 1 = Pounds per acre
- 2 = Parts per million (ppm)

#### **Item 4b(7): Soil pH**

Soil pH is a measure of the acidity or alkalinity of the soil.

- Record the soil test value for soil pH in Column 7.

### **Item 5: Additional Soil or Tissue Tests**

Various types of tests can be used to measure plant nutrient needs besides the standard soil test. These tests are mostly used to measure the crops' need for nitrogen. They allow the farmer to adjust nutrient applications precisely within each field, thereby reducing wasteful applications in excess of what is required by the crop.

#### **Item 5a: Pre-plant or pre-sidedress nitrate-nitrogen**

The preplant soil nitrate test is conducted before the crop is planted and measures the amount of residual or carryover nitrate in the root zone. The pre-sidedress soil nitrate test (PSNT) is conducted in late spring before the period of major nitrogen demand. The level of nitrate-nitrogen available in the soil at the time the test is performed is used to determine the amount of nitrogen that should be applied to the field.

- If a pre-plant or pre-sidedress nitrate-nitrogen test was performed, enter Code "1" for "YES" and continue.

### **Item 5b: Deep soil profile nitrate-nitrogen test**

The deep soil profile nitrogen test is conducted on soils taken from more than one foot below the soil surface. The test can be carried out before seeding or any time during the crop season to determine the level of crop available nitrogen.

- If a deep soil profile nitrate-nitrogen test was performed, enter Code “1” for “YES” and continue.

### **Item 5c: Leaf petiole or leaf tissue tests**

Leaf petiole and leaf tissue tests are conducted on plant material gathered at a particular growth stage of the crop. The leaf material is evaluated to determine any nutritional deficiencies of the crop and to recommend specific nutrient applications.

- If a leaf petiole or leaf tissue test was performed, enter Code “1” for “YES” and continue.

### **Item 5d: Post-harvest stalk test**

The post-harvest stalk test is conducted after the crop is harvested and provides feedback to the producer on that year’s fertilization regime. The amount of nitrate-N remaining in the stalk of the plant at maturity can be compared to benchmark values to indicate whether the crop was inadequately, excessively or appropriately fertilized with nitrogen. This information can be used to make fertilization decisions for future years. One common post-harvest stalk test is the Corn Stalk Nitrate Test (CSNT).

- If a post-harvest stalk test was performed, enter Code “1” for “YES” and continue.

### **Item 5e: Chlorophyll analysis**

Various types of tests based on chlorophyll analysis ("crop greenness") allow for precise application of nitrogen fertilizer. Types of chlorophyll analysis include leaf color charts, chlorophyll meters, optical sensors, and remote aerial sensing. All are based on the chlorophyll content of the plant relative to the plant age. This measure of "crop greenness" provides an estimate of the crop nitrogen status. If a grower determines the crop is nitrogen deficient, an additional nitrogen application is an option. On the

other hand, the test may show that no additional nitrogen is needed. This can greatly improve fertilizer use efficiency.

- If a chlorophyll analysis test was performed, enter Code “1” for “YES”.

### **Item 6: Global Positioning System (GPS)**

New technologies such as geo-mapping rely on Global Positioning System (GPS) information to identify soil properties and to map soil types. This technology provides precise accuracy in capturing soil properties.

- Enter “1” for “YES” if GPS was used (or will be used) to geo-reference and/or produce a map of soil properties for each year. If “Yes” for 2009, 2010, or 2011 continue; if “No” for all years, go to Section E.

#### **Item 6a: Map based on random sampling**

- Enter “1” for “YES” for each year where a map was (or will be) produced from soil tests based on random sampling from the selected field.

#### **Item 6b: Map based on grid sampling**

- Enter “1” for “YES” for each year where a map was (or will be) produced for the select field from soil tests based on grid sampling from the selected field.

#### **Item 6c: Map based on electrical conductivity of soil**

- Enter “1” for “YES” for each year a map was (or will be) produced for the select field based on the measurement of electrical conductivity of the soil.

## Item 7: Fertilizer Applications Table

### Column 1: Crop Year

Crop year is printed for each year specific table. The fertilizer applications must be recorded in the correct year specific table.

If fertilizer was applied in the previous fall for a crop to be harvested during the next year, include that application for the crop year of harvest. For example, if fertilizer was applied during the fall of 2010 for the 2011 crop, include this on the 2011 table.

### Column 2: Crop Name

- Record the primary crop for which the nutrients applied were intended. Use the Respondent Booklet to complete Columns 2 and 3. The crops listed in this table should also appear on the table in Section C.

### Column 3: Crop Code

- Enter the crop code for the crop listed in Column 2. Use the Respondent Booklet to complete Columns 2 and 3.

### Column 4: Materials Used

Record the plant nutrients (nitrogen (N), phosphate ( $P_2O_5$ ), potassium ( $K_2O$ ), and sulfur (S)) of each fertilizer material applied to the sampled field. These nutrients can be reported in either of two ways:

1. **Percent analysis:** This is the composition of the product applied, expressed as a percentage.
2. **Pounds of actual plant nutrients.** Record the fertilizer application data in terms of pounds, gallons, or tons applied PER ACRE. Be careful that the respondent does not give you the total amount of fertilizer applied to the entire field. If a respondent knows only the total pounds of fertilizer or plant nutrients applied to the field, you must calculate rate per acre and enter it in the table. Rate per acre is calculated as the total quantity applied divided by the acres to which the application was made. Show the computations for deriving the rate per acre in the margin of the form.

**Important:** Record each individual fertilizer application made to the

selected field on a separate line.

When fertilizer materials are bulk blended for application (for example, 10-10-10-3 combined with 21-0-0-24), record each product on a separate line in the fertilizer table, even though the fertilizer blend was applied in one trip over the field.

If fertilizer was applied as part of a tank mix with pesticide, only report the fertilizer portion of the mix in Section D. Make sure that the pesticides are reported in Section F.

### **Percent Analysis**

A common method for reporting fertilizer materials is by percent analysis of their content. Percent analysis is always expressed as Nitrogen (N), Phosphorus ( $P_2O_5$ ), Potassium ( $K_2O$ ), and Sulfur (S), in that order. For example, 13-13-13-5 is 13 percent Nitrogen, 13 percent Phosphate, 13 percent Potash and 5 percent Sulfur. This means that forty-four ( $13+13+13+5$ ) out of every one hundred pounds of this fertilizer is active ingredients (N,  $P_2O_5$ ,  $K_2O$ , S). Fifty-six ( $100 - 44$ ) pounds of every one hundred pounds of this fertilizer is carrier material (inert ingredients).

Two of the more common fertilizers used in crop production are 18-46-0-0 (diammonium phosphate or DAP) and 82-0-0-0 (anhydrous ammonia). If 18-46-0-0 were reported, record 18 in Column 4 under N (nitrogen) and 46 under  $P_2O_5$  (phosphate). The potash ( $K_2O$ ) and Sulfur (S) columns would be dashed since there is no potassium (potash) or sulfur in the mixture.

For anhydrous ammonia (82-0-0-0), record 82 under N in column 4. Since there is no phosphorus, potash, or sulfur in anhydrous, the phosphorus, potash, and sulfur columns should be dashed.

Some fertilizer materials are applied in liquid form. A common liquid fertilizer material used in crop production is 32-0-0-0 (nitrogen solution). For this material, you would record a 32 under N for nitrogen and dash the columns for phosphate, potash, and sulfur.

**In general, fertilizer reported by analysis will not have a total N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O analysis of more than 85. The sulfur and carrier or filler material make up the rest of the total analysis for commercial fertilizers.** If all four ingredients N, P<sub>2</sub>O<sub>5</sub>, K<sub>2</sub>O and S are added together, the total should never exceed 100. Under most situations, if the total of the first three values exceed 85, the farmer is probably reporting actual nutrients rather than percent analysis. For example, if a farmer reports 35-45-20-0, he's probably reporting pounds of actual nutrients instead of analysis since the three values (35 + 45 + 20) add to more than 85 percent.

For fertilizer applications reported by percent analysis, record the quantity applied per acre (including carrier) in Column 5 and the appropriate unit of measure, pounds (code 1), tons (code 3) or gallons (code 12), in Column 6.

For bulk blended fertilizer materials, use a separate line for each of the fertilizers that the dealer blended in the mixture. If the dealer mixed 150 pounds of 18-46-0-0 and 250 pounds of 0-0-21-23 together, record each on a separate line. DO NOT just add it up and record it on one line as 400 pounds of 18-46-21-23. This would be a major error, because the correct analysis of this fertilizer is 7-17-13-14, calculated by:

- N       $(150 \div 400) \times .18 = .068$  (or 7%)  
because there were 150  
pounds of 18-46-0-0 in the  
mixture and of those 150  
pounds, 18% was Nitrogen.
- P<sub>2</sub>O<sub>5</sub>     $(150 \div 400) \times .46 = .173$  (or 17%)  
because 46 percent of the  
150 pounds was available  
Phosphorus.
- K<sub>2</sub>O      $(250 \div 400) \times .21 = .131$  (or 13%)  
because 250 pounds of the  
total 400 were 0-0-60 and  
this material is 21 percent  
Potash.
- S         $(250 \div 400) \times .23 = .143$  (or 14%)  
because 23 percent of the 250 pounds

was available Sulfur.

Note: For this survey, the terms phosphorus and phosphate are used interchangeably.

### **Actual Plant Nutrients**

Another way farmers might report fertilizer use is in terms of Actual Plant Nutrients (APN) applied per acre. This may also be called pounds of active ingredients. If the farmer knew he applied 60 pounds of nitrogen; 35 pounds of phosphorus; 40 pounds of potash; and 35 pounds of sulfur PER ACRE, record this information in Column 4 and record code 1 in Column 6. Column 5 should be blank because we know the actual amount applied for each of the three materials so we don't need to calculate it from percentages.

When farmers report "units" of N, P<sub>2</sub>O<sub>5</sub>, K<sub>2</sub>O, or S, this is usually a clue that they are reporting pounds of actual nutrients. Fertilizer materials will amount to more than the actual nutrient contents of the products applied, because part of the material applied is carrier material, just like when the farmer reports by percent analysis.

For example, if the farmer reported that he applied 100 units of Nitrogen in the form of anhydrous ammonia, he would have applied about 122 pounds of 82% nitrogen ( $100 \div .82 = 122$ ). If this were reported by percent analysis, 82 would be recorded in the N column, 122 in Column 5 and 1 in Column 6. If it were reported as pounds of actual nutrients it would be recorded as 100 in the N column and 1 in Column 6. Column 5 would be left blank.

When actual plant nutrients (active ingredients) or "units" of a fertilizer are reported, you should probe to be sure the quantity applied is correct. One way to do this is to ask (when units were reported) if the actual weight of material applied was more than the number of units reported. For example, "You said you put down 100 units of UAN32 per acre. Did the material you applied actually weigh more than 100 pounds per acre?"

### Other Methods of Reporting Fertilizer Use

Farmers may also report fertilizers by name. The Respondent Booklet shows some of the more common fertilizers with their usual analysis.

**Anhydrous ammonia** is the strongest nitrogen fertilizer available. It must be stored in a tank under pressure. It is applied by injection into the ground or into irrigation water. Anhydrous is a liquid when under pressure, but turns into a gas when released and is lost if not injected into the soil. Anhydrous ammonia is a very popular fertilizer because it is often cheaper (per pound of nutrient) than other forms. It may be reported as "anhydrous", "gas", " $\text{NH}_3$ ", "82-0-0", "units of nitrogen", or as "pounds of actual nitrogen" (N).

**Aqua ammonia** is one of the more common types of liquid nitrogen fertilizers. It is made up of anhydrous ammonia and water and is often used in Western states. It may be reported in pounds (actual N) or gallons (material or product). Although it is a liquid, it is usually reported in pounds of actual N.

**Urea** is another commonly used nitrogen fertilizer because it has a high nitrogen analysis. It may be added through an irrigation system, usually as a nitrogen solution.

**Calcium nitrate** contains not less than 15 percent nitrogen and 19 percent calcium. Limestone or lime contains 40 percent calcium and 12 percent carbonate. Approximately 100 pounds of limestone contains the calcium equivalent of 210 pounds of calcium nitrate ( $100 * .4 = 40$  pounds and  $210 * .19 = 40$  pounds). For example, if 200 pounds per acre of calcium nitrate were applied to the selected field, "15" would be recorded in column 4 (Nitrogen), "200" in column 5 (quantity) and a "1" in column 6 (pounds).

With many of the other fertilizers listed in the Respondent Booklet, the analysis may vary. Probe to find out if the farmer knows the analysis or the pounds of actual nutrients applied. If he doesn't know the analysis, but knows the name, use the analysis shown in the Respondent Booklet. If a range exists for a given nutrient, any number that falls within the range can be selected.

### Column 5: Quantity Applied per Acre

If percent analysis is reported, record the amount of material applied to the selected field in terms of pounds, gallons, or tons applied per acre. If pounds of actual nutrients were reported in Column 4, leave column 5 blank.

**Be careful that the respondent does not give you the total amount of fertilizer applied to the entire field.** If a respondent knows only the total pounds of fertilizer or plant nutrients applied to the field and not the rate per acre, you must calculate rate per acre and enter it in the table. In the margin, show the computations for deriving the rate per acre.

$$\text{Total Pounds} \div \text{Acres} = \text{Rate per Acre}$$

For example, if the farmer applied a total of 1200 pounds to a sixty acre field, the rate per acre is calculated as:

$$1200 \text{ pounds} \div 60 \text{ acres} = 20 \text{ pounds per acre}$$

### Column 6: Material Unit Code

If percent analysis is reported in Column 4, record either pounds (code 1), tons (code 3) or gallons (code 12) of materials. If pounds of actual plant nutrients are reported in Column 4, enter code 1 in Column 6 and leave Column 5 blank.

### Column 7: Date Applied

- Record the date in which the fertilizer application was made. For example, if an application was made in April, have the respondent provide the approximate date of the application and record in Column 7.

Record month, day and year in digits. For example, April 27, 2010, will be entered as 0 4 2 7 1 0.

### Column 8: How Applied

Show the respondent the Fertilizer Applications Method Codes in the Respondent Booklet. Ask the respondent which of the application

methods was used to apply the fertilizer to the selected field.

The Application Method codes are:

**Code 1 - Broadcast, Ground without Incorporation:** Fertilizer material is applied to the entire surface area by land application equipment. Application may occur either before or after planting, usually before crop emergence. No mixing of the fertilizer material into the upper soil surface is needed or planned as part of the application.

**Code 2 - Broadcast, Ground with Incorporation:** Fertilizer material is applied to the entire surface area by land application equipment. Application usually occurs before planting. A planned mixing of the fertilizer into the upper soil surface is completed at the time of application or shortly thereafter. Incorporation of the fertilizer into the upper soil surface is often performed with a field cultivator, disk, or other tillage implement.

**Code 3 - Broadcast by Aircraft:** Fertilizer material is applied to the entire surface area by air application equipment. Include only those applications made by airplane or helicopter.

**Code 4 - In Seed Furrow:** Fertilizer material is placed in the seed furrow **at planting** time, generally through a separate attachment on the grain drill.

**Code 5 - Irrigation Water:** Fertilizer material is mixed with water in either sprinkler or gravity fed irrigation systems. The term used for this procedure is fertigation. The product is metered into the water delivery system (generally a sprinkler irrigation system) and is distributed across the field in the irrigation water.

**Code 6 - Chiseled, Injected or Knifed-in:** Fertilizer material is injected under pressure into the soil. This application method (using high pressure) is often used to apply anhydrous ammonia.

**Code 7 - Banded or Side dressed between Row:** Fertilizer material is placed between the crop rows. This method is mainly used for row crops. Products are applied **at or after planting**. The area between the rows is not treated.

Fertilizer products applied at planting are generally granular formulations and are placed in a 3 to 4 inch band on either side or above the seed. Early growing-season applications are also applied (either liquid or granular) on either side of the crop row.

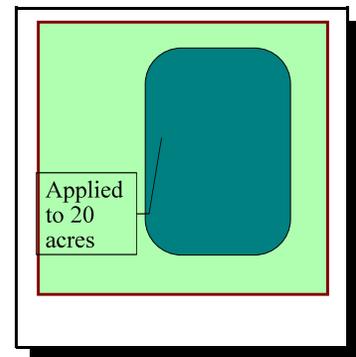
**Code 8 - Foliar or Directed Sprays:** After planting, fertilizer material is sprayed on or under the plant foliage.

### Column 9: Acres Treated

Record the number of acres in the selected field that were treated with the fertilizer materials recorded in Column 4.

When only a portion of the field area is treated it is called a **partial field treatment**. All land areas within the indicated area were not treated with the fertilizer application. For example, if the farmer applied 320 pounds of 16-20-0-15 to 20 acres of corn on May 19, 2011 in the center of a 40 acre field after the crop emerged, the line of the fertilizer table would be completed as follows. Note the amount per acre is calculated as  $320 \text{ pounds} \div 20.0 \text{ acres treated} = 16 \text{ pounds per acre}$ .

**Figure 6** Partial field fertilizer treatment



# 2011 NRI CEAP Interviewer's Manual

**Figure 7** Recording a partial field fertilizer treatment

LINE	1	3	4				5	6	7	8	9	10
	Crop Year	Crop Code	MATERIALS USED <i>[Enter percentage analysis or actual pounds of plant nutrients applied per acre.]</i>				What quantity was applied per acre?  <i>[Leave this column blank if actual nutrients were reported.]</i>	<i>[Enter material unit code.]</i> 1 pounds 3 tons 12 gallons	When was this applied?	How was this applied?	How many acres were treated in this application?	Was variable rate tech (VRT) used?
			N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	S			MMDDYY		ACRES	YES =1
01	11	6	16	20	—	15	16	1	051911	7	20.0	—

Since each individual application of fertilizer must be recorded on separate lines, the figure entered in Column 9 can never be greater than the number of acres in the field (from Section C).

Acres and tenths of acres must be reported in Column 9. Zero must be recorded after the decimal point if whole acres are recorded. For example, if the operator treated exactly 25 acres, the entry in Column 9 must be 25.0. Otherwise the edit will consider the entry to be 2.5 and serious errors will result when we summarize the amount of nutrient applied.

**Figure 8** Recording fertilizer treatments

LINE	1	3	4				5	6	7	8	9	10
	Crop Year	Crop Code	MATERIALS USED <i>[Enter percentage analysis or actual pounds of plant nutrients applied per acre.]</i>				What quantity was applied per acre?  <i>[Leave this column blank if actual nutrients were reported.]</i>	<i>[Enter material unit code.]</i> 1 pounds 3 tons 12 gallons	When was this applied?	How was this applied?	How many acres were treated in this application?	Was variable rate tech (VRT) used?
			N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	S			MMDDYY		ACRES	YES =1
01	10	6	16	20	—	15	100	1	102709	1	50.0	--
02	10	6	82	—	—	—	120	1	110109	6	50.0	--
03	10	6	28	—	—	—	125	1	040310	1	50.0	--
04	10	6	60	35	40	—		1	042210	7	50.0	1

In the above example:

Line 1 shows an application in the 2010 crop year of 100 pounds per acre of ammonium phosphate sulfate broadcast without incorporation in the fall (October 2009), before seeding to 50 acres in the spring.

Line 2 shows an application of 120 pounds per acre of anhydrous ammonia injected in the fall (November), before seeding to 50 acres.

Line 3 shows an application of a 125 pounds per acre of a 28 percent nitrogen solution broadcast without incorporation after seeding (April) to 50 acres during the 2010 crop year.

Line 4 shows an application of 60 pounds of nitrogen, 35 pounds of phosphate, and 40 pounds of potash per acre, banded/side dressed after seeding (April) to 50 acres during the 2010 crop year.

**Column 10: Variable Rate Technology used**

New technologies such as variable rate applications that rely on Global Positioning System (GPS) information to control the precise application of fertilizer create unique situations. It is possible for an applicator to have one or more products applied unequally across a field depending on the specific needs of each small area. Using the total pounds applied on the field divided by field acres will provide the rate per acre (Column 5).

- If you encounter variable rate technology used for fertilizer applications, put a code 1 in Column 10 for that application.

## Section E - Manure Applications

### What is Section E for? How is the Information Used?

The purpose of this section is to identify manure applications on the selected field for the 2011, 2010, and 2009 crop years.

Analyzing and tracking manure applications is becoming more important as environmental concerns are addressed. In order to meet increasing State and Federal guidelines for manure applications and to avoid adverse action, operators are becoming more vigilant in their handling and disposal of manure.

One of the outcomes of widespread adoption of nutrient management plans, which are a major emphasis in the Farm Bill programs, is that it is necessary to estimate the extent to which land is available and able to receive manure applications. NRCS will use the data from this section to estimate manure nutrient losses from farm fields.

### Use of Supplements

You will use a MANURE SUPPLEMENT if more lines are needed to record applications than the number of lines available in the table.

Copy the identification number as it appears on the questionnaire to the identification box on the supplement. Assign the next Table number (002, 003, 004, etc.) to each additional supplement used. You begin numbering the supplements with Table 002 because Table 001 appears in the questionnaire. Use as many supplements as you need.

Note: There are no year specific tables for manure applications. All three years can be put into the same table within the questionnaire and on the supplement if additional lines are required to capture all the manure applications. The order in which you report the data does not matter, you can start with any of the 3 years.

### Item 1: Screening for Manure Applications

Determine if livestock or poultry manure, commercially prepared manure, or biosolids were applied to the sampled field during the 2011, 2010, and/or 2009 crop years. If manure or biosolids were applied, enter code “1” for “YES”.

#### **Include:**

- manure produced on the operation,
- manure purchased from other farms,
- commercially prepared manure or compost products,
- biosolids, such as municipal solids and food wastes,
- manure, prepared manure and biosolids applied to the selected field in the fall of the previous year for the following crop year.

***[Enumerator Action: If manure was applied to the sampled field for the 2011, 2010, and/or 2009 crop years, continue. If no manure was applied to the sampled field, go to Section F.]***

### Item 2: Completing the Manure Applications Table

Complete the table for all manure applications made in the 2011, 2010, and/or 2009 crop years.

#### **Column 1: Crop Year**

Record the last two digits of the crop year for which the manure application was made. For example, if a product was applied during the 2010 crop year, code the cell with “10”. If it was applied in the fall of 2009 for the 2010 crop, code the cell with “10”.

### **Column 2: Crop Name**

Record the primary crop for which the manure was intended. Use the Respondent Booklet to complete Columns 2 and 3. The crops listed in this table should appear in the table in Section C. Make sure you record the crop name with the correct crop year.

### **Column 3: Crop Code**

Enter the crop code for the crop listed in Column 2. Use the Respondent Booklet to complete Columns 2 and 3.

### **Column 4: Quantity Applied per Acre**

For every manure application, record the amount of manure applied to the selected field in terms of pounds, tons, bushels, gallons, or acre-inches applied per acre.

If the operator tells you that part of the total amount applied was dry, measured in tons, and part of the amount applied was liquid, measured in gallons, one of these units must be converted. Record this in notes so that the total amount of manure applied to the field can be calculated in the Field Office.

If the operator does not know the amount of manure applied to the field and it cannot be estimated, instead find out the type and number of animals that produced the manure, and for what time period (all or just part of a year). Also find out how many other acres besides the acres of this field were covered with manure produced on the operation. Make good notes of all this information. The Field Office can estimate the amount of manure applied using this information.

**Be careful that the respondent does not give you the total amount of manure applied to the entire field.** If a respondent knows only the total pounds or gallons of manure or plant nutrients applied to the field and not the rate per acre, you must calculate rate per acre and enter it in the table. In the margin of the form, show the computations for deriving the rate per acre.

$$\text{Total Pounds (or gallons)} \div \text{Acres} = \text{Rate per Acre}$$

For example, if the farmer applied a total of 1200 pounds to a sixty acre field, the rate per acre is calculated as:

$$1200 \text{ pounds} \div 60 \text{ acres} = 20 \text{ pounds per acre}$$

Column 4 is not tied to columns 9 and 10 for manure reporting. Columns 9 and 10 should be coded to reflect the amount of nitrogen and/or phosphorus as reported in the manure analysis. Columns 4 and 5 are coded to reflect the per acre quantity of manure applied.

Column 7 should reflect how the manure was handled. (Solid = tons; liquid/slurry =gallons). The source of the manure will be used in conjunction with the handling and quantity per acre for further analysis.

Be sure to include notes to explain the situation.

### **Column 5: Material Unit Code**

Valid unit codes are:

- 1 = Pounds
- 3 = Tons
- 4 = Bushels
- 12 = Gallons
- 14 = Acre-inch

### **Column 6: Where Produced**

Use the crop codes listed on the questionnaire to record the source of the manure applied to the field. If an operation receives manure from more than one source, ask the respondent to indicate from which source the majority of the manure was acquired.

The source codes are:

- 1 - Produced on this operation,
- 2 - Purchased,
- 3 - Obtained at no cost from off the operation,
- 4 - Obtained with compensation. (Paid to take the manure.)
- 5 - Commercially prepared manure

## Column 7: Handling of Manure

Manure can be handled as a solid, liquid, or slurry (semi-solid). The amount of bedding or dilution water influences manure characteristics. Manure characteristics influence collection, transfer, storage, and spreading equipment.

Record the primary manure management system designed to handle the waste. If more than one system is used, ask the respondent for the system which handled the majority of manure during that year.

The manure management systems are:

- Code 1**      **Solid.** Solid manure is a combination of urine, bedding, and feces with no extra water added. Solid manure is typically generated in systems where bedding is added to manure to absorb moisture, or can result from drying conditions such as found on the surface of a feedlot. Solid manure can be stacked for storage and applied to the land using a spreader.
- Code 2**      **Liquid.** Liquid manure is any manure to which water is added in the collection, storage, or treatment process. Liquid manure typically contains no more than 5% dry solids. Liquid manure has a greater water content than slurry manure; that is, it is more diluted. It is usually associated with a flush system, or a system where large volumes of water are used to clean the manure from the production facility. Liquid manure requires large volume liquid storage facilities such as a lagoon, and it is applied to the land using a tank spreader or irrigation system.
- Code 3**      **Slurry.** Slurry (semi-solid) manure is typically generated in systems where little or no bedding is added. The manure is mixed with water to the extent that it does not have a solid consistency, and must be transferred using pumps. Slurry manure is typically between 5% and 15% solids. It is "thicker" than liquid manure, but cannot be stacked or handled the same way as solid manure. It is usually applied to the land using a tank spreader or irrigation system.

### Column 8: Manure Test

Manure varies considerably in nutrient content from one operation to the next. Variables are animal species, stage of growth, feed rations, type of storage, plus other factors.

- If a manure nutrient test was completed to determine the composition of the manure applied, code the cell with a “1”, and ask the respondent to provide the results from the manure analysis test. These results are usually expressed depending on how the manure is handled. (lbs/1000 gallons, lbs/ton, or lbs/acre-inch)
- If the respondent does not know if a manure nutrient test was completed on the manure applied, code the cell with a “2” and go to Column 11.
- If a manure nutrient test was not completed on the manure applied, code the cell with a “3” and go to Column 11.

### Column 9: Manure Analysis

Operators may not know the analysis of materials used and as a result, the response for Column 9 may be unknown. This is not unexpected.

If known, record the amount of nutrients (nitrogen (N), phosphate ( $P_2O_5$ ), and potassium ( $K_2O$ )) of each manure application to the selected field.

**Amount of actual nutrients.** Use pounds of actual nutrients, if known. The manure test results will report the amount of nitrogen, phosphorus, and potassium for every 1000 gallons, tons, or acre-inch. Reporting formats may vary from source.

Record the manure data as reported on the results of the manure test.

Be careful that the respondent does not give you the total amount of manure applied to the entire field. If a respondent knows only the total pounds of plant nutrients applied to the field, you must calculate rate per acre and enter it into Column 4 of the table. Rate per acre is calculated as the total quantity applied divided by the acres to which the application was made. Show the computations for deriving the rate per acre in the margin of the form.

**Important:** Record each individual manure application made to the sampled field on a separate line.

### **Actual Nutrients**

Another way farmers might report manure applied is in terms of actual nutrients applied per acre. If the farmer knew for each application of manure he applied 30 pounds of nitrogen; and 15 pounds of phosphorus per 1000 gallons, ton, or acre-inch, record this information in Column 9.

When farmers report "units" of N, P<sub>2</sub>O<sub>5</sub>, or K<sub>2</sub>O, this is usually a clue that they are reporting pounds of actual nutrients.

When actual plant nutrients or "units" of a manure application are reported, you should probe to be sure the quantity applied is correct. One way to do this is to ask (when units were reported) if the actual weight of material applied was more than the number of units reported.

### **Column 10: Material Unit Code**

If the nutrient concentrate from a manure test can be reported, record as either pounds/ton of material (code 31), lbs/1000 gallons of material (code 121) or pounds/acre-inch of material (code 15). If actual nutrients can be recorded, record as actual nutrients (code 19).

### **Column 11: Manure Source**

Different types of raw manure have different nutrient content. Determine whether the major source of the manure applied to the selected field was from beef cattle, dairy cattle, hogs, sheep, poultry, equine, a biosolid (such as municipal waste), or some other livestock.

The code list for the type of livestock manure is:

- Code 1 - Beef Cattle
- Code 2 - Dairy Cattle
- Code 3 - Hogs
- Code 4 - Sheep
- Code 5 - Poultry
- Code 6 - Equine (horse, mule, etc.)
- Code 7 - Biosolids (food waste, municipal sludge, etc.)
- Code 8 - Other (record the type of manure or nutrient in a note.)
- Code 9 - Don't Know

This information will also be used to calculate N, P, and K application rates in cases where the respondent does not know the information in Column 9.

### **Column 12: Composted Manure**

Composting is the aerobic decomposition of manure or other organic materials. The composted material is odorless, fine-textured, low-moisture and can be bagged and sold for use in gardens, or nurseries. Composted manure can also be used as fertilizer on cropland with little odor. Composting improves the handling characteristics of any organic residue by reducing its volume and weight. Composting can kill pathogens and weed seeds.

Determine if the respondent knows if the manure applied to the selected field was composted.

- Enter a “1” if “YES”, and continue to column 13.
- Enter a “2” if they do not know or enter a “3” if “NO”, and skip to column 14.

### Column 13: Composting Method

There are various methods for composting manure. The primary types are windrowing, static pile, and in-vessel.

**Code 1**      **Windrow.** Active windrow composting is the production of compost in windrows using mechanical aeration produced by a front-end loader or a specially designed windrow turner. Passive windrow composting is the production of compost in piles or windrows by natural aeration over long periods of time. Generally, material to be composted is collected and promptly piled into windrows, which remain untouched. Passive aeration may be used to compost manure from poultry, dairy cattle and sheep.

**Code 2**      **Static pile.** Aerated static pile composting is the production of compost in piles or windrows which makes use of an air source such as perforated plastic pipes, aeration cones or a perforated floor. Aeration is accomplished either by forcing or drawing air through the compost pile. Aeration systems can be relatively simple using electrical motors, fans and ducting, or they can be more sophisticated incorporating various sensors and alarms.

**Code 3**      **In-Vessel.** In-vessel composting is the production of compost in drums, silos or channels using a controlled aeration system. Aeration of the material is accomplished by continuous agitation using aerating machines or fans which provide air flow. The main advantages of the in-vessel system over others are a more efficient composting process and a decreased number of pathogens. In-vessel composting can maintain rapid decomposition year-round and can produce a quality product on a consistent basis.

**Code 4**      **Other.** Other methods of composting include bin composting, silos, rotating drums, vermicompost (using earthworms), etc.

- Enter the code in column 13 for the primary method of composting used to process the manure applied to this field.

### Column 14: When Applied

Ask the respondent what date the manure or biosolids were applied to the sampled field. Record each application made during each crop year on a separate line.

If the respondent cleaned out storage facilities every spring, applied the manure to his field over several days, list this as one application and use the date when the process was completed.

- Record month, date, and year, in digits. For example, January 27, 2010, will be entered as 0 1 2 7 1 0. Refer to the calendar in the Respondent Booklet for reference.

### Column 15: How Applied

Show the respondent the Manure Applications Method Codes in the Respondent Booklet. Ask the respondent which of the application methods was used to apply the manure to the selected field.

The Application Method codes are:

**Code 1**      **Dry Broadcast, without Incorporation:** Dry manure is applied to the entire surface area by land application equipment. Application may occur either before or after planting, usually before crop emergence. No mixing of the material into the upper soil surface is needed or planned as part of the application. This is a common practice for hay and pasture fields.

**Code 2**      **Dry Broadcast, with Incorporation:** Dry manure is applied to the entire surface area by land application equipment. Application usually occurs before planting and a planned mixing of the manure into the upper soil surface is completed at the time or shortly after the time of application. Incorporation of the manure into the upper soil surface is often performed with a field cultivator, disk, or other tillage implement. This is a common practice for fields planted to row crops.

- Code 3**      **Liquid Broadcast, without Incorporation:** Liquid manure is applied to the entire surface area by land application equipment. Application may occur either before or after planting, usually before crop emergence. No mixing of the material into the upper soil surface is needed or planned as part of the application. This is a common practice for hay and pasture fields.
- Code 4**      **Liquid Broadcast, with Incorporation:** Liquid manure is applied to the entire surface area by land application equipment. Application usually occurs before planting, and a planned mixing of the manure into the upper soil surface is completed at the time or shortly after the time of application. Incorporation of the manure into the upper soil surface is often performed with a field cultivator, disk, or other tillage implement. This is a common practice for fields planted to row crops.
- Code 5**      **Chiseled, Injected or Knifed-in:** Manure is injected under pressure into the soil. This application method (using high pressure) is rare for manure applications and is mostly used near residential areas to keep odor to a minimum. However, a new knifing technique for incorporating poultry manure deep into the soil is gaining use in some areas of the country where there is concentrated poultry production. This technique is accomplished using a new type of equipment called a poultry litter subsurfer.
- Code 6**      **Furrow or Basin Irrigation:** Manure is mixed with water in gravity fed irrigation systems. The term used for this procedure is fertigation. The product is metered into the water delivery system and is distributed across the field in the irrigation water.

**Code 7**      **Sprinkler Irrigation:** Manure is mixed with water in sprinkler irrigation systems. The term used for this procedure is fertigation. The product is metered into the water delivery system (generally a sprinkler irrigation system) and is distributed across the field in the irrigation water.

- Enter the correct application code.

### **Column 16: Acres Treated**

Record the number of acres in the selected field that were treated with the manure recorded in Column 4. If only part of a field was treated, record only those acres. For example, if the operator made a particular manure application to only 25 acres in a 40 acre field, enter 25.0 in Column 16. Since each individual application of manure must be recorded on separate lines, the figure entered in Column 16 can never be greater than the number of acres in the field.

Acres and tenths of acres must be reported in Column 16. Zero must be recorded after the decimal point if whole acres are recorded. For example, if the operator treated exactly 25 acres, the entry in Column 16 must be 25.0. Otherwise the edit will consider the entry to be 2.5 and serious errors will result when we summarize the amount of nutrient applied.

**IMPORTANT NOTE: Items 3 - 8 should only be completed if manure was applied for any of the 3 years included in the survey. If manure was not applied, Section E should not be completed.**

### **Item 3: Application Influenced by Conservation Plans or Restrictions**

Growers may voluntarily reduce the amount of manure they apply to their land based on recommendations in their Conservation Plan, Nutrient Management Plan (NMP), or Comprehensive Nutrient Management Plan (CNMP).

In some locations, manure application may be regulated or restricted by State and/or local governments. Application rules or laws are generally based on the amount of nutrients that will be used by the crop during the growing season, such that excess nutrients will not wash off the land. In some localities, a nitrogen rate standard is used to recommend or restrict

the amount of manure that may be applied. In other localities, a phosphorus rate standard is used. A phosphorus rate standard will have lower rates of manure applications (tons/acre of manure) than a nitrogen rate standard.

For this Item, respondents will identify to what extent manure applications are being governed by nitrogen or phosphorus application rate protocols.

- If the application rate applied to this field was influenced by State or Local restrictions, or by the operators conservation plan, enter a code “1” for “YES” and continue with Item 3a. If “NO”, enter code “3” and go to Item 4.

### **Item 3a: Basis Used to Determine Manure Applications**

Ask the producer which nutrient was the basis used to determine the manure application rates.

- If nitrogen was the nutrient that determined the manure application rate, enter a “1”; if phosphorus was the nutrient that determined the manure application rate, enter a “2”.

### **Item 3b: Soil Phosphorus Level Before Manure Application**

Record the value for phosphorus from the soil test completed prior to the last application of manure. This may or may not be the same value for soil test phosphorus as reported in Section D, Item 2, depending on whether manure has been applied to the field since that soil test was conducted.

- Record the soil test value for phosphorus in the first box and the unit of measure for this value in the second box.

Valid unit codes are:

- 1 = milligrams per kilograms phosphorus (mg/kg P)
- 2 = Parts per million phosphorus (ppm P)
- 3 = Pounds per acre (lbs/ac)

#### **Item 4: Reduction of Commercial Fertilizers by Applying Manure**

Ask the respondent if the amount of commercial fertilizers applied to the selected field was reduced because of the nutrients supplied by manure applications.

- Enter a code “1” in the cell if “YES” there was a reduction of commercial fertilizers applied to the selected field due to the manure nutrients applied and continue with Item 4a. If “NO”, enter code “3” and go to Item 5.

#### **Item 4a: Commercial Nitrogen Reduced**

Ask the respondent if applications of commercial nitrogen fertilizer were reduced due to manure application.

- If “YES”, enter code “1”, otherwise code = “blank”.

#### **Item 4b: Commercial Phosphorus Reduced**

Ask the respondent if applications of commercial phosphorus fertilizer were reduced due to manure application.

- If “YES”, enter code “1”, otherwise code = “blank”.

#### **Item 5: Frequency of Future Manure Applications**

In many cases a conservation plan, NMP or CNMP will allow manure applications only once every several years to prevent phosphorus build-up in the soil.

Ask the respondent how often he/she plans to apply manure to the selected field in future years. The timing codes are:

- 1 - No plans to apply manure again,
- 2 - At least once per year,
- 3 - Once every 2 years,
- 4 - Once every 3 years,
- 5 - Once every 4 years,
- 6 - Once every 5 or more years.

- Enter the indicated timing code for future manure applications.

### Item 6: Origin of Manure Applied to Selected Field

Refer back to the Manure Table Column 6 (page 20 of the questionnaire).

- If a '1' was entered in Column 6 in the Manure Table (manure applied was produced on this operation), then enter "1" for Item 6 and continue.
- If a '1' was not entered in Column 6 in the Manure Table, then enter "3" for Item 6 and go to Question 8.

### Item 7: Type of Manure Storage System

Record what type of manure storage system the operator uses to handle the manure type applied to the selected field. If more than one type of storage system is used for a specific manure type (i.e., solid), record the storage system that handled the majority of manure.

The types of storage system for coding this question are:

#### Solid Manure

- |               |  |
|---------------|--|
| <b>Code 1</b> | <b>Stacking Slab (open storage)</b> A concrete or compacted soil slab or pad used for stacking manure until it can be spread on the land or hauled away.                     |
| <b>Code 2</b> | <b>Covered Slab</b> A concrete or compacted soil slab or pad used for stacking manure which has a cover placed over the stacked manure, such as a tarp or temporary shelter. |
| <b>Code 3</b> | <b>Manure Pack</b> The accumulation of solid manure in feedlots until it is spread on the land or hauled away.   |
| <b>Code 4</b> | <b>Barn, Shed, or House</b> A structure with a roof, such as a barn, shed, or a poultry house used to store manure until it can be spread on the land or hauled away.        |
| <b>Code 5</b> | <b>Other (Solid), Specify.</b>   |

**Code 6**      **None**

**Slurry Manure**

**Code 7**      **Concrete or Steel Tank, Basin, or Pit** A storage structure, whether under the production building or a separate structure, that is constructed of something other than earth (usually concrete). Examples include concrete pits under slatted floors, and settling basins with concrete bottoms.

**Code 8**      **Earthen Storage Facility** An impoundment made by excavation or earth fill for temporary storage of manure. The impoundment may or may not have a synthetic liner of some type.

**Code 9**      **Other (Slurry), Specify**

**Liquid**

**Code 10**      **Single Stage Lagoon or Holding Pond** A single holding pond or lagoon.

**Code 11**      **Two Stage Lagoon System** A storage or treatment system that consists of two cells (lagoons/storage) connected in series. The first cell is a lagoon that provides treatment and the second cell could be either a lagoon or holding pond primarily used as storage.

**Code 12**      **Run Off Storage** (Open-lot runoff only)

**Code 13**      **Other (Liquid), Specify**

### Item 8: Added Amendments

Amendments may be added to manure in order to reduce phosphorus runoff, control ammonia emissions, and/or reduce the number of microorganisms found in the manure. Manure amendments may be added to the manure prior to field application, or may be applied directly on the field in a separate application.

There are many types of amendments, including aluminum and iron compounds, strong acids, and compounds such as nitrapyrin and NBPT (N-butyl thiophosphoric triamide).

- If an amendment was added to the manure prior to application, or applied directly to the field in a separate application, enter code “1” for “Yes” in the box. Otherwise code = “blank”.

## Section F - Pest Control Applications

### What is Section F for? How is the Information Used?

Pesticide data are collected to estimate the amount of pesticides used in crop production. This data will be used with other information collected in this questionnaire to estimate the amount of pesticide residue that is transported from farm fields to surface and ground water, and the impact of conservation practices on pesticide movement from fields.

This section is similar to the fertilizer section. Chemical mixes are described and application practices are enumerated. Include all chemicals applied for the 2011, 2010, and 2009 crop years on the selected field.

#### **Include:**

**Seed Treatments.** Seed treatments performed by the operator should be reported in this Section. Include only seed treatment done by the respondent AFTER the seed is purchased in the year specific pesticide table. Do not report the seed treatment if the seed is treated by the seed company prior to delivery to the operator.

#### **Exclude:**

**Adjuvants.** Adjuvants should not be reported in this section. Adjuvants include such materials as wetting agents, spreaders, emulsifiers, dispersing agents, foaming agents, foam suppressants, penetrants and correctives. By using the proper adjuvant it is often possible to use certain chemical pesticides in a tank mix that otherwise would present compatibility problems.

**Fertilizers.** Be careful not to include foliar fertilizer sprays reported as part of a chemical tank mix in this section. Fertilizer applications must be recorded in the fertilizer section.

### Use of Supplements

The Pesticide Applications tables are year specific and provide 15 lines to record pesticide applications to the selected field. Having year specific

tables should reduce the need for supplements.

If more than 15 lines are needed to record the pesticide applications to the selected field for the 2011, 2010, and/or 2009 crop years, use a **Pesticide Applications Supplement**.

Copy the identification as it appears on the questionnaire to the identification box on the supplement. For example in 2010, if a supplement is used, then assign the next year specific Table number (201, 202, 203, etc.) to each additional supplement used. You begin numbering the supplements with Table 201 because Table 200 appears in the questionnaire for the 2010 pesticide applications. Use as many supplements as you need.

### Use of Records

Because of record keeping requirements for restricted use pesticides, (sometimes called RUP's), most operators will have records of chemical applications for each field. Encourage the respondent to use these records if they are available.

Respondents can answer many of these questions for the current crop year without records. Where records help most is in jogging the farmer's memory on past crop year's applications, spot treatments, rare and irregular applications or deviations of chemical mixes from usual spray schedules or rates of application.

### Use of Respondent Booklet

Use the Respondent Booklet when completing Section F with the respondent. The vast majority of pesticide products are listed in the Respondent Booklet. It is very important to obtain not only the correct product trade name (i.e. Roundup), but also the correct formulation of the product to ensure the correct product code is recorded. Different formulations of the same product trade name often have different amounts of the active ingredient (chemical). You should encourage the respondent to use the Respondent Booklet since it makes the job of enumeration easier

as well as making reporting faster and more accurate.

To aid in identification of the correct product applied, the products in the Respondent Booklet are categorized as LIQUID (L) or DRY (D) formulations. We want the form of the product when it was purchased, not the form when it was applied. This should help you and the respondent find and record the correct product codes.

The Respondent Booklet also lists the type or class of each product:

- Herbicide (H),
- Insecticide (I),
- Fungicide (F),
- Miscellaneous (M),
- Miscellaneous Growth Regulator (MG),
- Miscellaneous Soil Fumigant (MS),
- Miscellaneous Defoliant (MD), and
- Other products (O).

Some chemicals and pesticides have more than one use. Some products with more than one use will be listed twice with separate product codes.

For example: Gramoxone Extra

4314	Gramoxone Extra 2.5 L	H
9037	Gramoxone Extra 2.5 L	MD

For products that are listed more than once, be sure to probe for what it was used for (i.e. Herbicide or Defoliant) and record the product code associated with that use.

Note that each product code listed in the Respondent Booklet specifies the corresponding trade name and formulation. The numbers and letters after the product name identify the concentration and form. For example, Canopy 75DG; Canopy is the trade name and the 75DG indicates the formulation. The 75 indicates the concentration as the percent of active ingredient in a pound of product (in this case, 75%), and the DG indicates that the form of the product is Dispersible Granules. For Basagran (4L), Basagran is the trade name and the 4L indicates the formulation. The 4 indicates 4 pounds of active ingredient in a gallon of product and the L indicates a liquid concentrate.

Also note that for several products there is more than one formulation for a given trade name. For example, Diazinon is listed as Diazinon 14G and Diazinon 4E and Diazinon 50W and Diazinon AG500(4E). Different formulations of a product have different concentrations of the active ingredient and percent of inert materials.

It is extremely important that you get the correct product code because active ingredient concentrations for different products and different formulations vary greatly. Since we summarize by active ingredient in the product, recording a product or its formulation incorrectly will make a difference when the active ingredient application rate per acre is calculated. For example, if you record the code for Dyfonate II 20-G (1038) when you really should have recorded the code for Dyfonate II 10-G (1037), then we will summarize twice the amount of active ingredient than we should. That will make it look like operators apply more chemicals to crops than they actually do.

Also, if you record the Dyfonate II 10-G code when you really should have recorded the code for Dyfonate II 20-G, we will summarize half as much active ingredient as we should. This is not good either. We need the correct information listed in the questionnaire.

If you cannot find a reported product in the Respondent Booklet, complete the information below the table to classify and summarize unlisted products. There are several lines at the bottom of each table to list chemicals not found in the code list. Be sure to list the products in the appropriate year.

**Herbicides (4000 series)** may be applied before weeds emerge or after weeds have emerged. Some herbicides are used to “burn down” or kill weeds prior to planting in no-till systems. Herbicides applied at time of planting are generally applied to the entire soil surface (broadcast). Herbicides requiring soil incorporation may be mixed into the soil by the action of the planter or by attachments which are part of the planter. Incorporation also may be accomplished by a tandem hook-up of a tillage implement(s) behind the applicator or planter. Other herbicides are effective by being left on the surface without incorporation. Some herbicides may also be used to defoliate the crop prior to harvest.

Herbicides used for other than weed control will have a Product Code in the 9000 series (defoliant).

**Insecticide (1000 series)** materials are applied to control insects that damage plants by feeding on plant tissues. Granular insecticides are sometimes applied at planting and placed in the seed row (in-furrow) by a separate attachment.

**Fungicides (7000 series)** are applied to control disease organisms which affect the growth and development of the plant, such as pod-and-stem blight, anthracnose, brown spot, etc.

**Other Chemicals (9000 series)** are used to fumigate the soil, regulate the growth of the plant, defoliate the crop prior to harvest, etc. Complete the pesticide table for all chemical applications made on the sampled field during the 2011, 2010, and 2009 crop years. Include custom applications made by a custom applicator and applications made by the operator.

### Item 1: Pest Control Applications

If any pest control products were applied to the field for the 2011, 2010, or 2009 crop years, enter code “1” for “YES”. Pests include any undesirable organism, such as weeds, insects, mites, diseases, nematodes, rodents, etc. Products used to control these organisms include pesticides (herbicides, insecticides, fungicides, nematocides, miticides), defoliant, biocontrol agents, seed treatments, and other conventional or organic products.

**IMPORTANT NOTE:** If the field has not yet been harvested for the 2011 crop year, you must be sure to probe the respondent for any pesticide applications they plan to make to this field prior to harvest and record them in this table.

- For each year, if any pest control products were applied, enter “1” for “YES”, and continue.
- If no pest control products were applied, enter “3” for “NO” for the correct year. If no pest control products were applied in any of the 3 crop years, go to Section G.

### **Item 2: Pesticide Applied to Improve Plant Health**

In addition to controlling a specific pest, some pesticides can be applied to crops in order to improve plant health. For example, they may increase vigor, increase tolerance to environmental stresses, or increase yield. Determine if any pesticides were used specifically for the purpose of improving plant health rather than to control pest activity for the 2011 crop year.

- If the operator used pesticides specifically to improve plant health, enter “1” for “YES”.

### **Item 3: Alter Pesticide Application to Protect Pollinators**

The application of pesticides may have unintended consequences, such as killing beneficial insects like honey bees and other plant pollinators. However, producers may reduce or eliminate impacts on pollinators by altering the way in which pesticides are applied (for example, spraying at night or avoiding application during the bloom period).

Ask the operator if they altered their pest applications in any way in order to protect honey bees or native pollinators for the 2011 crop year.

- If the operator altered their pest applications in order to protect honey bees or native pollinators, enter “1” for “YES”.

### **Item 4: Pesticides Rotated or Tank Mixed to Prevent Pest Resistance**

A common pest management practice is to rotate (from one year to another) or tank mix chemicals with different mechanisms of action. By “different mechanisms of action” we are talking about HOW the chemical kills the pest (attacks the nervous system, digestive system, etc).

- If the operator rotated or tank mixed chemicals for the primary purpose of slowing the development of pest resistance in 2011, enter “1” for “YES”.

### **Item 5: Use of Treated Seed**

- If the operator purchased certain crop seeds specifically because they were pre-treated with fungicides or insecticides, record a “1” for “Yes” in the box for Item 5.

### **Item 6: Selection of Crop Cultivars with Tolerance to Herbicides**

Some crop varieties have a genetically engineered tolerance to the herbicides glyphosate and glufosinate. Farmers can thereby easily control weeds in fields where these crops are planted, as the herbicide will kill the weeds but not the crop.

- If the operator chose to plant specific crop cultivars because they were tolerant to herbicides, record a "1" for "Yes" in the box for Item 5.

### **Items 7: Pest Control Risk Decisions**

If the operator applied any pest control products on the selected field in 2011, complete Item 7.

There are a number of factors operators may consider in deciding what pesticides to use. These include:

- Possible health risk to applicator
- Risk to beneficial organisms
- Risk to natural resources
- Concern about pest resistance to the pesticide
- Crop safety.

Ask the respondent if they considered anything other than cost and effectiveness when choosing a pest control product to apply to the selected field.

- Enter "1" for "Yes" for any factor the respondent considered in choosing which pest control product to use during the 2011 crop year. If the operator mentions a factor which is not listed, code a "1" for "other" and write in their reason.

### **Item 8: Pesticide Application Tables**

Year specific pesticide tables, Items 8a (2011), 8b (2010) and 8c (2009) are provided. The year specific tables should reduce the number of supplements that are required to collect all the pesticide data for each of the crop years.

If "1" ("yes") was coded for any of the three years in Item 1, the corresponding pesticide table should be completed. The response recorded in Item 1 should correspond with data recorded in the pesticide application tables.

**IMPORTANT NOTE:** If the field has not yet been harvested you must be sure to probe the respondent for any pesticide applications that may be made to this field prior to harvest. They must be recorded in the 2011 table.

**Include:**

**Seed Treatments.** Most crop seed is treated with an insecticide/fungicide product. Seed treatment done by the respondent AFTER the seed is purchased should be reported in the year specific pesticide table. However, do not report the seed treatment if the seed is treated by the seed company prior to delivery to the operator.

When reporting seed treatments use code "10" in Column 11. The total amount applied should be entered in column 9. Column 8 must be left "blank".

The objective of including seed treatments is to identify any additional pesticide applied to the seed. This usually occurs if the operator uses his/her own seed. The homegrown seed may be treated prior to going to the field or the seed may be treated in the field. Field seed treatment consists of coating the seed with the insecticide or fungicide product just prior to planting.

**Exclude:**

**Adjuvants.** An adjuvant is used when mixing pesticides to improve such characteristics as how well the product sticks to the plant material, or to improve compatibility for mixing pesticides in a tank mix. By using the proper adjuvant it is often possible to use certain chemical pesticides in a tank mix that otherwise would not mix well.

Adjuvants include such materials as wetting agents, spreaders, emulsifiers, dispersing agents, foaming agents, foam suppressants,

penetrants, surfactants, solvents, solubilizers, buffering agents, and stickers.

If you or the respondent are in doubt about whether a product should be included, record it anyway and write notes to explain the situation.

**Fertilizers.** The respondent may report foliar fertilizer sprays, especially if they were part of a tank mix. Fertilizer applications should not be recorded in this section; they should have been recorded in the fertilizer section.

Herbicide materials may be applied before weeds emerge or after weeds have emerged. Some herbicides are used to “burn down” or kill weeds prior to planting in no-till systems. Herbicides applied at the time of planting are generally applied to the entire soil surface (broadcast). Herbicides requiring incorporation may be mixed into the soil by the action of the planter or by attachments which are part of the planter. Incorporation also may be accomplished by a tandem hook-up of a tillage implement(s) behind the applicator or planter. Other herbicides are effective by being left on the surface without incorporation. Some herbicides may also be used to defoliate the crop prior to harvest.

Insecticide materials are applied to control insects that damage plants by feeding on plant tissue. Granular insecticides are sometimes applied at planting and placed in the seed row (in-furrow) by a separate attachment.

Fungicides are applied to control disease organisms which affect the growth and development of the plant, such as pod-and-stem blight, brown spot, etc.

Other chemicals may be used to fumigate the soil, regulate plant growth, or defoliate the crop prior to harvest.

For each year specific table, if any pesticides were applied, check the YES box at the top of the table, then complete the Pesticide Table.

### **Column 1: Crop Year**

The last two digits of the crop year in which the pesticide was applied are pre-printed in each year specific table. For example, for products applied during the 2011 crop year, use the 2011 crop specific table (coded with “11”). Start with the 2011 applications table and move to the 2010 and 2009 applications table.

**NOTE:** The last two digits of the crop year must be hand written into the supplement only. Supplement tables should be crop specific. A separate supplement must be used for each year additional pesticide lines are required.

### **Column 2: Crop Name**

Record the primary crop for which the pesticides applied were intended. The crops listed in this table should also appear in the table in Section C, Item 1. Make sure you record the correct crop name with the correct crop code. Use the Respondent Booklet to complete Columns 2 and 3.

### **Column 3: Crop Code**

Enter the code in Column 3 for the crop to which the pesticide(s) was applied. Use the Respondent Booklet to complete Columns 2 and 3. The crops listed in this table should appear in the table in Section C, Item 1 for each of the 3 crop years. Make sure you record the correct crop code with the correct crop name.

### **Column 4: Product Code**

Ask the operator to identify the chemical or pest control product applied to the crop coded in Column 3. Record the product code for each chemical from the Pesticide Code List found in the Respondent Booklet.

You should also record the **complete** product name on the far left of the line being used in the pesticide table. This makes it easier to refer to the product, by name, while asking the remaining questions across the table. It also aids in enumeration if the same product/code is reported more than once with different application rate per acre in the same year, or for a different crop year. Recording the **complete** product name also assists the Field Office in editing the questionnaire.

If two or more products are applied with a single application (tank mix) a separate line must be used for each product. Use Column 6 to identify products applied in a tank mix.

To help the respondent, start by asking if any pest control products were applied after the previous crop was harvested or plowed down. Next, ask about other preplant applications and then follow with products applied at

planting and then after planting. Remind the operator to report all types of pesticides, including herbicides, insecticides, fungicides, defoliants, growth regulators, and desiccants. Record the applications for the years in which the operator made the day-to-day decisions for the sampled field.

Be aware that the products applied do not have to be listed in the order of application. If the operator remembers a preplanting application, it can be added to the next available line.

### **Column 5: Product Form (Liquid/Dry)**

Ask the respondent if the product was in a liquid or dry state when it was purchased. Record an "L" or a "D" in this column to indicate Liquid or Dry, respectively. Probe for clarification if the liquid or dry designation listed by the product code selected from the Respondent Booklet does not agree with what you record here for the product.

Common formulation abbreviations include:

**D (Dust)** - Dusts contain a low percentage of active ingredients on a very fine dry inert carrier such as talc, chalk, or clay. Dust formulations are usually applied directly as purchased and the concentration of the active ingredient(s) are expressed as a percent. Dusts are dry products.

**DF (Dry Flowable), WSG (Water Soluble Granules)** - Also known as water dispersible granules, these DF or WSG products are small pellets formulated to reduce dust. They are like wettable powders except that the active ingredient is formulated on a granule instead of a powder. The product pours easily into spray tanks for mixing with water. Their concentrations are expressed as percents. These formulations are dry products.

**E or EC (Emulsifiable Concentrates)** - These formulations are usually thicker than water and are mixed with water and applied as sprays. They contain one or more active ingredients, one or more solvents and an emulsifier. Their concentrations are generally indicated in pounds per gallon. This formulation is considered a liquid.

**F or FL (Flowable)** - These products are in liquid form. They contain finely ground active ingredients suspended in the liquid. They are mixed with water for application. Their concentrations are generally indicated in pounds per gallon.

**G (Granular)** - Granular products contain active ingredients coated or absorbed onto coarse particles like clay, ground walnut shells, or ground corn cobs. The pellets are about the diameter of the lead in a pencil (or larger); during shipment the granules have a tendency to break down and create dust. These are used as purchased. Their concentrations are expressed as percents. The granular formulation is a dry product.

**L (Liquid)** - These products flow like water. Concentrations are usually expressed in pounds per gallon.

**S or SP, W or WP (Soluble or Wettable Powder)** - These are dry products, much like flour, which will dissolve or disperse in water. Their concentrations are indicated in percents.

### **Column 6: Tank Mix**

Most chemicals are applied to the field as single products. However, sometimes two or more individual products are mixed in the spray tank by the farmer/custom applicator and applied to the field as a tank mix.

Products applied in a tank mix must be identified as tank mixes. Since there is only space in the table for one product per line, the separate products in tank mixes must be recorded on separate lines. Identify the products in a tank mix by recording in Column 6 the line number of the first product in the tank mix.

For example, consider a three chemical tank mix. You record the first product on line 6, the second product on line 7 and the last product on line 8. In Column 6 of line 6 you should record 6 so we will know this was the beginning of the list of products in that tank mix. In Column 6 of line 7, you'll record 6 so we know that this product was part of the same tank mix that you started listing on line 6. In Column 6 of line 8, you will record 6 for the same reason.

For products not applied as part of a tank mix, enter a dash in Column 6. For the first product in a tank mix, be sure to ask each question in Columns 7 - 12. For each additional product in the tank mix after the first product, be sure to ask the questions in Columns 8 or 9 and 10 because the answers likely will be different than for the first product. Information recorded in Columns 7, 11, and 12 should be the same as for the first product in the

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tank mix. These data can just be copied from the entries in the columns for the first product of the tank mix.

DO NOT confuse tank-mixes and packaged premixes. A tank mix is any pesticide spray which is prepared immediately before use by mixing two or more chemicals and water in the spray tank. Packaged premixes are brand name products that contain two or more active ingredients. These are products where the manufacturer has taken individual active ingredients and combined them in a container. Examples include Ramrod/Atrazine, and Lasso/Atrazine. These manufactured mixes have their own code in the Respondent Booklet, so they don't have to be listed with separate codes for the chemicals included in the product.

New technologies such as variable rate applications that rely on GPS information to control the precise application of chemicals create unique situations. It is possible for an applicator to have more than one chemical product tank, and to apply more than one product unequally across a field depending on the specific needs of each small area. Some areas of the field may be treated with only one of the multiple products. Since the multiple products are not mixed and applied consistently together across the field, these are not considered tank mixes. This use of GPS technology is still very rare.

Figure 9 Recording pesticide tank mix information

APPLICATION CODES for column 11	
4 Seed Furrow	61 Broadcast, aerial
5 Chemigation	62 Broadcast, aerial, foliar
6 Chisel/Injected or knifed In	71 Banded/Side-dressed
8 Direct spray, foliar	73 Banded/Side-dressed, foliar
10 Seed Treatment by producer	
11 Broadcast, ground, not incorporated	76 T-Banded (Combo of banded & injected)
13 Broadcast, foliar	
21 Broadcast, ground, incorporated	

	1	2	3	4	5	6	7	8	or	9	10	11	12	13
LINE	Crop Year	Primary Crop	Crop Code	What products were applied to this field? [Use product codes from Respondent Booklet.]	Was this product bought in liquid or dry form? [Enter L or D]	Was this part of a tank mix? [If tank mix, enter line number of first product in mix.]	When was it applied? MMDDYY	How much was applied per acre per application?		What was the total amount applied per application in this field?	[Enter unit code.] 1 Pounds 12 Gallons 13 Quarts 14 Pints 15 Liq Ounces 28 Dry Ounces 30 Grams	How was this product applied? [Enter code from above.]	Was this product applied to the entire field, only a portion of the field, or as a spot treatment? 1 Entire field 2 Part of field 3 Spot treatment	How many acres in this field were treated with this product?
NOTES														
Far-go granular 10%	01	11	Wheat	165	4211	D	---	012211		12.00	. _ _	6	1	5.0
Banvel (4L)	02	11	Corn	6	4136	L	2	051111		.	1 0 0	8	1	5.0
Express	03	11	Corn	6	4205	D	2	051111		.13	. _ _	8	1	5.0

In this example,

- Product lines 2 and 3 are in a tank mix.
- For products mixed in a tank mix, columns 6, 7, 11, 12, and 13 must be the same.

### **Column 7: Date Applied**

Ask the respondent on what date the product was applied to the selected field, and enter the month, day, and year in the appropriate form - MMDDYY. For example if a product was applied on May 11, 2011, code the cell "051111". Use the calendar provided in the Respondent Booklet for reference. See Figure 10.

Herbicides and soil fumigant applications may occur just prior to or up to several months before planting. Herbicide or insecticide materials are sometimes applied at the time the crop is planted. These applications may be band treatments covering a small section of the row over the seed furrow or broadcast treatments covering the entire soil surface.

Herbicide, insecticide, or fungicide materials are commonly applied after planting is completed. They could be applied days, weeks, or months after planting the crop.

### **Column 8 or 9: Application Rate**

Column 8 (rate per acre) **or** Column 9 (total amount) may be used for each product reported. **Don't** use both on the same line.

#### **Column 8: Rate per Acre per Application**

Record the chemical application rate per acre for the product used on the selected field. Rate per acre is the amount used for one application to one acre. Because rates per acre are often quite small with very toxic chemicals, rates are reported to hundredths of units. BE SURE that if whole numbers or rates to a tenth are reported, zero(s) are entered after the decimal point. If the operator applied  $\frac{1}{2}$  ounce of a product per acre, then record the rate as 0.05.

Be VERY careful to record the rate accurately with the correct unit.

If an application rate per acre is obtained in Column 8, then nothing should be entered in Column 9.

With variable rate technology and for spot treatments, application rates for a particular product or tank mix may vary across the field. In these cases, do not attempt to obtain a rate per acre; instead, obtain the total amount applied to the field using Column 9.

### **Column 9: Total Amount Applied per Application**

If the respondent is not able to report the application rate per acre in Column 8, use Column 9 to record the total quantity applied per application to all acres treated in the selected field. This figure should be a total quantity for one application, NOT the “sum total” of multiple applications. As in Column 8, put in the correct decimal.

If the respondent is able to give either total quantity applied per application or rate per acre, select the option which the respondent feels will give the most accurate data.

In some cases, respondents cannot report either the rate per acre or the total amount of the product applied per application. In these cases, there is one additional way you might be able to collect the total amount applied.

If the respondent knows: 1) the amount of the product mixed in every 100 gallons of water, 2) the number of gallons in each tank applied, and 3) the number of tanks used to cover the acres, make a note of these figures. The survey statistician will be able to calculate the amount of product used.

Other ways of reporting include parts per million (PPM) . In these cases, try to find out the amount of actual product (before mixing with water) used, and write complete notes for the survey statistician to follow.

Do not record the spray volume applied to the field. The purchased (concentrated) product is mixed with water and the diluted spray solution is generally applied at rates of 20 - 60 gallons per acre with ground equipment and 5 - 10 gallons per acre by air.

Do not record the inclusion of adjuvants, surfactants or carriers in the spray solution. They are added to the spray solution to enhance the ability of the

pesticide to stick to the foliage and/or aid in the absorption into the plant system.

Do not record liquid fertilizer solutions applied in conjunction with a pesticide in the Pesticide Table. The information on liquid fertilizers should be recorded in the Fertilizer Table.

### Column 10: Unit Code

Record the units using the unit codes listed in Column 10. Unit codes are:

Code 1 - Pounds  
Code 12 - Gallons  
Code 13 - Quarts  
Code 14 - Pints  
Code 15 - Liquid Ounces  
Code 28 - Dry Ounces  
Code 30 - Grams  
Code 40 - Kilograms  
Code 41 - Liters

Write notes if any unit other than the ones listed is reported.

Some conversion factors you may need to use are:

#### Liquid Products

1 Gallon = 4 Quarts  
1 Quart = 2 Pints  
1 Pint = 16 Fluid Ounces  
2 Cups = 1 Pint  
1 Cup = 8 Fluid Ounces

#### Dry Products

1 Pound = 16 Dry Ounces  
1 Ounce = 28.3 Grams  
1 Pound = 453.6 Grams

BE SURE to keep the unit code and product formulation consistent. If the operator purchased a LIQUID pesticide product, the unit code must be ounces, pints, quarts, or gallons. If a DRY pesticide product (granular, wettable powder, or dry flowable) was used, the unit code must be dry ounces, pounds, or grams. If the form of product conflicts with the reported unit code, perhaps the wrong product code was recorded. Check the Respondent Booklet to see if there are other formulations for the product.

### Column 11: How Applied

Obtain the physical application method used to apply the pesticide product to the selected field. The application methods codes are printed in the **APPLICATION CODES** box positioned above the pesticide table. Show the respondent the Fertilizer/Pesticide Applications Method Codes in the Respondent Booklet.

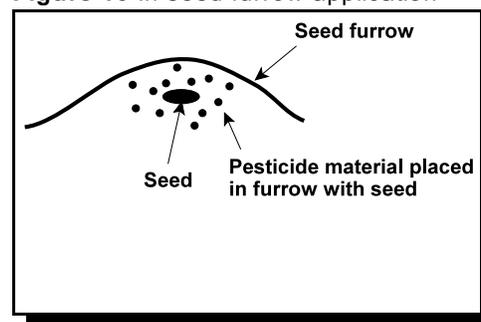
Herbicides, insecticides, and fungicides are most often applied as broadcast treatments to cover the entire soil surface (or plant surface). Band treatments, where a narrow band of pesticide is applied over the row covering about one-third of the soil surface, is also a common method of application. Less frequent methods include in-furrow, chemigation (in irrigation water), or spot treatments.

Choose the Application Method from the list that **best** describes the application method used. The Application Method codes are defined as follows:

**Code 4 - In Seed Furrow:** Pesticide material (herbicide, insecticide, fungicide, or other) is placed in the seed furrow **at planting time** generally through a separate attachment on the grain drill. This method is sometimes used for granular insecticides applications.

**Do not** confuse this with seed treatments where the seed surface is coated with a pesticide product by the farmer or seed dealer before the seed is put in the planter box.

**Figure 10** In seed furrow application



**Code 5 - Chemigation (In Irrigation Water):** Pesticide material (herbicide, insecticide, fungicide, or other) is mixed with water in either sprinkler or gravity fed irrigation systems. The term used for this procedure is chemigation. The product is metered into the water delivery system (generally a sprinkler irrigation system) and is distributed across the field in the irrigation water.

**Code 6 - Chisel, Injected or Knifed-in:** Pesticide material (herbicide, insecticide, fungicide, or other) is injected under pressure into the soil. This application method (using high pressure) is used with pesticide spray materials for nematode control.

**Code 8 - Direct Spray, Foliar:** After planting, pesticide material (herbicide, insecticide, or fungicide) is sprayed on or under the plant foliage, with the spray directed specifically to areas where pests located. This may be done using drop nozzles, for example. Sensor guidance equipment is sometimes used to direct the spray.

**Code 10 - Seed Treatment by producer prior to planting:** In most cases, seeds are treated by the manufacturer prior to the sale of the seed. Seed treatment applied by the manufacturer should not be reported. Products that are seed treatments are usually in the 8000 series.

If seeds used in the selected field were treated with one or more pesticides after they were purchased or home grown seeds were treated with one or more pesticides, report the pesticide(s) used to treat the seed using application code 10.

**Code 11 - Broadcast, ground, not incorporated:** Pesticide material is applied to the entire surface area using land application equipment, but material is NOT incorporated into the soil. May be applied prior to planting, at planting, or shortly after planting but usually before emergence.

**Code 13 - Broadcast, ground, foliar:** This is the same as code 11, except that the pesticide is applied after the plant has emerged.

**Code 21 - Broadcast, ground, incorporated:** Pesticide material is applied to the entire surface area using land application equipment, but material IS incorporated into the soil at the time of application. Incorporation of the pesticide into the upper soil surface is often performed with a field cultivator, disk, or other tillage implement. Application usually occurs prior to planting.

**Code 31 - Broadcast, aerial:** Pesticide material is applied to the entire surface area using air application equipment. Application

would be done prior to planting, at planting, or shortly after planting before a full canopy is in place.

**Code 32 - Broadcast, aerial, foliar:** Same as code 31, but is done after the crop has emerged and developed a significant canopy.

**Code 71 - Banded/Side-dressed:** Pesticide material is placed in or over the crop row, rather than broadcast over the entire surface. This method, mainly used for row crops, is usually completed prior to or at planting or after planting but prior to emergence. The area between the rows is not treated. This application method should not be confused with direct spray.

Application rates for band treatments are to be reported on a per acre basis and not the rate that was applied to the banded segment. Band treatments with the same pesticide product normally result in lower application rates than broadcast treatments. For example, if the band only covers one-third of the row, the application rate will normally be about one-third the broadcast application rate.

**Code 73 - Banded/Side-dressed, foliar:** Same as code 71, but applies to applications after the crop has emerged.

**Code 76 - T-Banded (Combo of banded and injected):** Prior to or at planting, the pesticide material is applied in or over the crop row, injecting the pesticide materials into the soil.

### **Column 12: Spot Treatment and Partial Field Treatment**

In some cases, the pesticide application may not be made to the entire field, rather the pesticide is applied to only part of a field, or in small “spots” only. Spot treatments should not be confused with treatment of part of a field.

When an application is made only to a portion of a field, the treated acreage can be discerned. For example, the north half of a 40 acre field. Such partial field treatments should be reported like any other applications, including

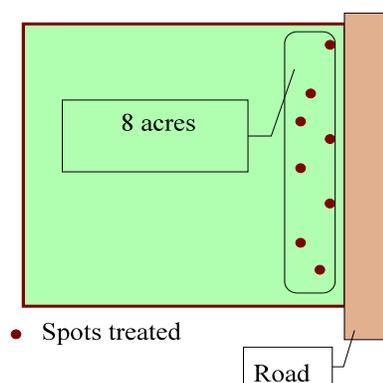
acres treated and an application method from the codes listed. With spot treatments, acreage is difficult to determine. A spot treatment might involve walking or riding around with a tank on the applicator's back, spraying a herbicide on problem weeds. Spot treatments to field crops are rare and should be verified.

If spot treatments were made in the selected field, enter the crop name (column 2), crop code (column 3), product code (column 4), product form (column 5), first line if a tank mix (column 6), when applied (column 7), the total amount applied (column 9), unit (column 10), application code (column 11), indicator for spot treatment (column 12), and acres treated (column 13).

**IMPORTANT:** For spot treatments, do not enter a rate per acre (column 8)

**Spot treatment example:** A farmer with a 40 acre field of soybeans in 2011 identified a small area along a road with severe thistle infestation, and decided to spot treat these areas with Roundup Ultra using a sprayer with a hood. He used 2 ounces to spot treat the thistles over 8 acres of the field next to the road. The respondents best guess is that he actually treated about ½ acre. If acres treated is not known, get the farmers best estimate of acres covered, either as acres or percent of the field covered by the spot treatments.

Figure 11



The line of the pesticide table for this application would be completed as shown below.

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**Figure 12** Recording a spot pesticide treatment

APPLICATION CODES for column 11												
4	Seed Furrow	61	Broadcast, aerial									
5	Chemigation	62	Broadcast, aerial, foliar									
6	Chisel/Injected or knifed In	71	Banded/Side-dressed									
8	Direct spray, foliar	73	Banded/Side-dressed, foliar									
10	Seed Treatment by producer	76	T-Banded (Combo of banded & Injected)									
11	Broadcast, ground, not incorporated											
13	Broadcast, foliar											
21	Broadcast, ground, incorporated											

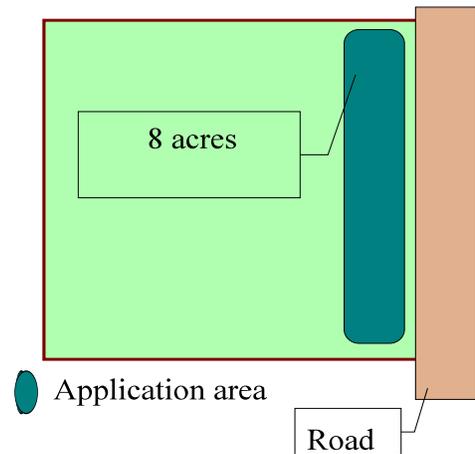
  

	1	2	3	4	5	6	7	8 or 9	10	11	12	13		
	Crop Year	Primary Crop	Crop Code	What products were applied to this field? [Use product codes from Respondent Booklet.]	Was this product bought in liquid or dry form? [Enter L or D]	Was this part of a tank mix? [If tank mix, enter line number of first product in mix.]	When was it applied? MDDYY	How much was applied per acre per application?	What was the total amount applied per application in this field? [Enter unit code.] 1 Pounds 12 Gallons 13 Quarts 14 Pints 15 LiqOunces 28 Dry Ounces 30 Grams 40 Kilograms 41 Liters	How was this product applied? [Enter code from above.]	Was this product applied to the entire field, to only a portion of the field, or as a spot treatment? 1 Entire field 2 Part of field 3 Spot treatment	How many acres in this field were treated with this product?		
LINE	01	11	Soybean	26	4561	L	---	070211	._	2.00	15	08	3	0.5
NOTES	Roundup Ultra													

**Figure 13**

**Partial field treatment example:**

A farmer with a 40 acre field of corn in 2010 identified an area along a road with a severe blight problem, and decided to treat the area with Blite-Out. He applied 4 ounces per acre of the product as a direct spray on the foliage over 8 acres of the field next to the road. The line of the pesticide table for this application would be completed as shown below. The portion of the field treated does not need to be contiguous to be measurable, i.e., several areas that total 8 acres would be recorded in the same way provided that the applicator adjusted his sprayer to apply at 4.00 ounces per acre.



**Figure 14** Recording a partial field pesticide treatment

APPLICATION CODES for column 11	
4 Seed Furrow	31 Broadcast, aerial
5 Chemigation	32 Broadcast, aerial, foliar
6 Chisel/Injected or knifed In	71 Banded/Side-dressed
8 Direct spray, foliar	73 Banded/Side-dressed, foliar
10 Seed Treatment by producer	76 T-Banded (Combo of banded & injected)
11 Broadcast, ground, not incorporated	
13 Broadcast, foliar	
21 Broadcast, ground, incorporated	

	1	2	3	4	5	6	7	8	or	9	10	11	12	13	
LINE	Crop Year	Primary Crop	Crop Code	What products were applied to this field? <small>[Use product codes from Respondent Booklet.]</small>	Was this product bought in liquid or dry form? <small>[Enter L or D]</small>	Was this part of a tank mix? <small>[If tank mix, enter line number of first product in mix.]</small>	When was it applied?  <small>MM/DDYY</small>	How much was applied per acre per application?		What was the total amount applied per application in this field?	<small>[Enter unit code.]</small>	How was this product applied?  <small>[Enter code from above.]</small>	Was this product applied to the entire field, to only a portion of the field, or as a spot treatment?  <small>1 Entire Field 2 Part of Field 3 Spot Treatment</small>	How many acres in this field were treated with this product?	
NOTES															
Blight Out	01	10	Corn	6	7999	L	---	061311		4.00	.	15	8	2	8.0

### Column 13: Acres Treated

Record the number of acres of the specified crop that were treated with the pesticide product recorded in Column 4. This will be the same as the number of planted acres recorded for the field in Section C (Cropping History and Conservation Practices, Item 1, Line 3) when the entire field was treated with the pesticide. If only part of the selected field was treated, then enter the number of acres representing the share of the field actually treated. Record the acres treated to the nearest tenth.

Here it is important to know the difference between treated acres and treatment acres. Treated acres are the actual physical (land) acres of crop which were treated -- it doesn't matter how many times they were treated, they are only counted once. Treatment acres are the total number of acres covered by applications of a product regardless of whether they are the same acres or different acres.

If the same 40 acres are treated 4 times, the number of treated acres is 40 and the treatment acres is 160 (4 x 40). In this example, a line for each separate application to 40.0 acres would be recorded.

*Never record treatment acres in the NRI CEAP questionnaires.*

We account for multiple applications of the same product and formulation by recording each application on a separate line.

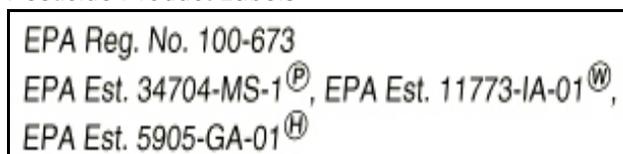
Acres and tenths of acres must be reported in Column 12. Zero **MUST BE** recorded after the decimal point if whole acres are recorded. For example, if the operator treated exactly 25 acres, the entry in Column 12 must be 25.0. Otherwise the edit will consider the entry to be 2.5 and we will get serious errors when we summarize active ingredients applied per acre.

### Information for Unlisted Pesticides

If you could not find a product in the Pesticide Code List in the Respondent Booklet when completing the Pesticide Table, complete the area below the table to provide as much information as possible. First, record the line number of the pesticide application that the information refers to. Then record what it was used for (herbicide, insecticide, fungicide, or other). Next record the EPA registration number, if it is available, or the name and formulation of the product. Record whether the product was liquid or dry when it was purchased. Finally, record where the product was purchased. This will assist the Field Office if questions arise about the product and additional information is needed.

The EPA Product Registration number (refer to Figure 16 below) is printed on the product label. These numbers are several digits long, such as 312-19-18713 and 2980-4. EPA Product Registration numbers are not the same thing as EPA Establishment numbers. In this example, the EPA Product Registration number is **100-673**. EPA Establishment numbers (EPA Est.) indicate which companies are licensed to market the product, but do not uniquely identify the product. In this example, there are three EPA Establishment numbers listed: 34704-MS-1, 11773-IA-01, and 5905-GA-01.

**Figure 15** EPA Numbers that appear on Pesticide Product Labels



If the respondent does not know the EPA product number or the trade name and formulation, record as much information about the product as you can,

especially the "where purchased". This information will enable identification of the product in the Field Office. The "where purchased" is important because if more information is needed, we can then call the dealer.

For example, if the operator has a pesticide applied by a custom applicator, he/she might not know the formulation of the product, but if the "where purchased" is recorded the Field Office can check to get the correct formulation.

A good, complete entry for Unlisted Products in the notes portion of the section is as follows:

**Figure 16** Providing information needed for unlisted pesticide products.

*[For pesticides not listed in Respondent Booklet, specify--]*

LINE	Pesticide Type <i>(Herbicide, Insecticide Fungicide, etc.)</i>	EPA No. or Tradename and Formulation	Form Purchased <i>(Liquid or Dry)</i>	Where Purchased <i>[Ask only if EPA No. cannot be reported.]</i>
<u>6</u>	<u><i>Insecticide</i></u>	<u><i>Danitol 2.4 EC, EPA # 39398-17</i></u>	<u><i>Liquid</i></u>	
<u>16</u>	<u><i>Fungicide</i></u>	<u><i>RegulatorII</i></u>	<u><i>Liquid</i></u>	<u><i>Midland Chem Supply</i></u>

## **Section G - Pest Management Practices**

### **What is Section G for? How is the Information Used?**

Integrated Pest Management (IPM) is an approach to control pests in an environmentally responsible manner. IPM combines physical, biological, cultural, and chemical methods of pest control which decrease the reliance on chemicals.

An integrated pest management approach can:

- Be an alternative to pesticide use,
- Reduce the number of pesticide applications needed,
- Reduce the toxicity of the pesticides used by producers,
- Improve the effectiveness of the pesticides applied.

Section G collects information on the use of IPM techniques to control pests in the selected field in 2011. IPM practices may be used even if pesticides are not applied to a crop.

The information collected in Section G will be used determine grower adoption of nonchemical pest management practices, reduction in chemicals where alternative pesticide treatment strategies are in place, and the corresponding environmental, public health, and cost benefits derived from decreased pesticide usage.

## **Introduction and Definition of Pests**

The introductory statement helps the respondent in two ways:

- 1) It explains you will be asking the operator about pest management practices used on the selected field in 2011 and how decisions are made regarding those practices.
- 2) It defines PESTS for the operators to include WEEDS, INSECTS, AND PLANT DISEASES. Many operators tend to focus on one kind of pest depending on the crop, but we are interested in control practices for all types of pests.

For example, soybean growers may think only about weeds as pests; cotton growers may focus only on insects as pests.

In this section, when the word PESTS is used, it refers to ALL types of, WEEDS, INSECTS, AND PLANT DISEASES. If you don't introduce pests this broadly for all operators, operators may answer the questions with only one kind of pest in mind.

### **Item 1: Method of Pest Scouting**

This question serves as a screening question based on the intensity level of pest scouting. Scouting involves some means of monitoring the field for the presence of pests. Scouting is an activity, and there are differences in the ways producers scout for pests. Scouting may be done once in a while when an operator is doing fieldwork, or scouting may be done every so many days during the growing season or even daily when weather conditions favor rapid development of specific pests.

- Enter the code that represents the primary approach the respondent used to scout for pests in the selected field.
  - If general scouting is done, enter code 1, then go to Item 3.
  - If deliberate scouting is done, enter code 2, then go to Item 2.
  - If no scouting is done, enter code 3, then go to Item 8.

**Code 1      Conducting general observations while performing routine tasks.** The operator does not have a structured scouting strategy where deliberate scouting trips are made to the field at determined intervals or when weather conditions favor rapid development of specific pests. Rather, the operator periodically checks for the presence of pests as field tasks are performed. The scouting approach is somewhat casual - the operator may not even get off the tractor to look more closely for pest presence. Also code “1” for Item 1 when in the field the operator looks for pests at random and does not attempt to make counts, as described below.

**Code 2      Deliberately going to the field specifically for scouting activities.** The operator has an established scouting strategy (based on time and/or method) and goes to the field deliberately for the purpose of checking for pests. The field may be scouted based on a schedule such as every four days. The operator may have some predetermined approach to how the scouting will be done (check every  $x$  number of rows and every  $x$  number of plants per row, etc.). Insect traps may be used for monitoring infestation levels. These are more deliberate approaches to scouting than conducting “general observations” or scouting only if there is field work to be done in or adjacent to the field.

**Code 3      This field was not scouted for pests.**

### Item 2: Established Scouting Process Used

An established scouting process is where the operator's method of deliberately scouting the field includes using a recommended system of checking every  $x$  number of rows and every  $x$  number of plants per row, or another mathematically sound approach to accurately determine pest levels in the field; or if pests counts are taken while randomly checking in the field; or if pest traps are used to monitor insect levels.

- If an established scouting process was used, enter code "1" = "YES".

If the operator deliberately scouts the field for pests by randomly spot checking one or more parts of the field (not using a systematic system), and does not keep records of pest population counts or use pest traps, the answer is "NO" and the cell is left blank.

### Item 3: Why Scouting was Done

a) A pre-determined schedule or calendar? Pest monitoring consists of "in field" scouting surveys based on a calendar of when pests normally are expected to appear. Calendars are developed specifically for a geographic area and show the historic occurrence of the pest.

- If the field was scouted based on information from a predetermined schedule or calendar, enter code "1" = "YES", otherwise = "blank".

b) A pest development model? Pest development models are used to forecast the time and development stage of pest infestations. The models incorporate environmental factors such as growing degree days, maximum and minimum temperatures, rainfall, and humidity, and correlate them to seasonal emergence of overwintering insects, pest development, population levels, and migration. Often, a trapping network is used in conjunction with predictive models to forecast growth and development of pests and predict when growers need to scout their fields.

- If the field was scouted based on information from a pest development model, enter code "1" = "YES", otherwise = "blank".

- c) A pest advisory warning? Under certain climatic conditions, the potential for pest infestation is higher than normal. The County, Cooperative or University Extension advisor, Regional Pest Management Center, crop consultant or other advisory source will often issue a pest advisory warning - a recommendation that growers scout their fields for particular pests.
- If scouting in the field was done based on a pest advisory warning, enter code "1" = "YES", otherwise = "blank".

#### **Item 4: Pest Scouting**

##### **Column 1: Was Field Scouted for Pests**

Determine if the selected field was scouted for weeds, insects or diseases.

- For each type of pest (Item 4a - weeds, Item 4b - insects, Item 4c - diseases, Item 4d - other) for which the field was scouted, enter code "1" = "YES", otherwise = "blank".

Then complete Columns 2 and 3.

##### **Column 2: Who Performed Scouting for Pests**

Ask the respondent who did the majority of the scouting in the field for Item 4a (weeds), Item 4b (insects), Item 4c (diseases), and Item 4d (other). If two or more people did equal amounts and there is no clear-cut major "scouter", enter the lowest code of those scouting.

- If the operator, a partner, or a family member did the most scouting, enter code "1".
- If most was done by an employee (other than the operator, a partner, or a family member), enter code "2".
- If most of the scouting was done by an employee of a farm supply or chemical company, enter code "3".
- If a hired crop consultant or a commercial scouting service was used, enter code "4".

### **Column 3: Pest Pressure Level**

Integrated Pest Management programs establish pest levels, called action thresholds, and recommend controls only if those thresholds are crossed. Generally, the threshold is the point at which it would cost more to apply a chemical than would be lost due to the pest. These thresholds are pest and site specific, meaning that what may be acceptable at one site may not be acceptable at another.

Ask the respondent to rate the pest pressure in 2011 for Item 4a (weeds), Item 4b (insects), Item 4c (diseases), and Item 4d (other) based on the scouting data and compared to published information on the infestation threshold level for that pest.

The threshold codes are:

- 1 - Low
- 2 - Medium
- 3 - High

### **Item 5: Scouting After Pesticide Application**

Ask if the respondent returned to the field to scout after applying a pest control product in order to evaluate the success of the application.

- Enter code “1” = “YES”, if followup scouting occurred, otherwise = “blank”.

### **Item 6: Records Kept to Track Pests**

Only organized, formal records should be considered, not just notes jotted down on scraps of paper. It doesn't matter who kept the records -- it can be the operator, an employee, scouting service or someone else.

An example of keeping formal pest records from a systematic scouting approach comes from the North Carolina Cooperative Extension Service. Three steps are recommended to scout for weeds:

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- 1) make at least 10 stops in each field;
- 2) at each stop, mark off approximately 30 feet of row (10 paces);
- 3) record the type and number of weeds found within a 1-foot band in the row. Then record the scouting results on a “weed threshold worksheet” like the one above. The information recorded on the worksheet is used with other information to determine whether a herbicide treatment is necessary.

Determine if some type of formal written, electronic, or map records were

**Figure 17** Example of information recorded in written scouting records.

Weed	Number Counted	Number of Stops	Number of Weeds per Stop

kept for this field on pest activities, counts, etc. Important Note: If scouting was performed by someone outside of the farm operation (Items 4a or 4b in Column 2 are coded “3” or “4”), some type of formal scouting records were most likely kept. If not, make a note as to why no records were kept.

- Enter code “1” = “YES”, if records were kept on scouting.

### **Item 7: Scouting Data Used to Compare Infestation Threshold Guidelines**

This question asks if the operator compared scouting data against published infestation threshold information to determine whether or not to make a chemical application to control the pest(s). The “threshold” generally relates to an economic “breakeven point”. If the pest count from scouting is below the threshold number, it would likely cost more to apply the chemical than the economic loss the pest is likely to cause through reduced crop yield or quality.

- Enter code “1” for “YES”.

### **Item 8: Used Field Mapping of Previous Weed Problems**

Ask if this operation used field mapping of previous years pest problems to assist in making pest management decisions on the selected field in 2011. The level of insect, weed and disease infestation is not always uniform throughout a field. Previous years mapping data can help an operator determine if it would be more cost efficient to treat portions of a field rather than the whole field. Operators may use a topographic map or other type map for this purpose. There are also software programs available for field mapping. By identifying trouble spots, the map can help in making future pest management decisions.

- If this practice was used, enter code “1” for “YES”.

### **Item 9: Diagnostic Laboratory Used for Pest Identification**

Diagnostic laboratories can assist producers in identifying pests found in their field. For example, soil samples can be analyzed for the presence of soil borne pests, and plant tissues can be analyzed to identify diseases and pathogens. Determine if the operator had such a biological analysis performed by a diagnostic laboratory for the selected field in 2011.

- If this practice was used, enter code “1” for “YES”.

**Item 10: Activities specifically for managing or reducing the spread of pests.**

Respond to Item 9 only if the practice(s) was done specifically for the purpose of pest management.

**Item 10a: Remove or Plow Down Crop Residues**

By managing crop residue after a crop is harvested, a vital habitat for pests is removed. Methods of control include removing, plowing under, and/or burning crop residue.

- If the operator used this practice to control pests, enter code “1” for “YES”.

**Item 10b: Alter Crop Rotation to Control Pests**

Find out if crops were rotated in the field during the past 3 years for the primary purpose of controlling pests. Pest control is only one of several reasons crops could have been rotated. Be sure to probe to ensure that the control of pests was the primary reason for rotating crops on this field.

- If the operator used this practice to control pests, enter code “1” for “YES”.

**Item 10c: Maintain Ground Covers**

Determine if any ground covers, mulches, or physical barriers were maintained in or around the selected field to reduce pest problems.

- If the operator used this practice to control pests, enter code “1” for “YES”.

**Item 10d: No-Till or Minimum Till**

Using no-till or minimum till is a practice used for weed control. The amount of weed seed germination is reduced when the soil is not disturbed. Be sure to probe to ensure that the control of pests was the primary reason for using no-till or minimum till on this field.

- If the operator used this practice to control pests, enter code “1” for “YES”.

**Item 10e: Adjust Row Spacing or Plant Density**

Find out if row spacing (width) or plant density (number of seeds planted per acre) were adjusted in this field for the purpose of controlling pests.

- If the operator used this practice to control pests, enter code “1” for “YES”.

**Item 10f: Release Beneficial Organisms**

Beneficial organisms are predators, parasites and other natural enemies of crop pests. Certain beneficial organisms can be purchased and released in the field. An example of a beneficial organism that is used on corn pests is the *Trichogramma* wasp, which is a very tiny parasite wasp that kills pests by laying eggs inside the pest's eggs.

Find out if the operator purchased and released any beneficial organisms on this field.

- If the operator used this practice to control pests, enter code “1” for “YES”.

**Item 10g: Chopping, Spraying, Mowing, Burning**

Eliminating habitat where pests can breed and grow is an important pest management strategy. Farmers often mow or otherwise maintain areas immediately adjacent to fields to minimize the habitat where insects live.

Find out if practices such as mowing, spraying, burning, tilling, and chopping of field edges, lanes or roadways, were used to slow or control the spreading of pests into the field.

- If the operator used this practice to control pests, enter code “1” for “YES”.

### **Item 10h: Trap Crop**

Another pest management practice is the planting of a trap crop. A trap crop is a form of vegetation planted to provide a refuge or sanctuary for a particular insect. These areas are often parallel to the field or along the field separated by a ditch, a road or some other physical barrier.

- If the operator used this practice to control pests, enter code “1” for “YES”.

### **Item 10i: Cleaning of Equipment**

Cleaning of equipment used in a field prevents carrying pests (such as weeds and disease) from one field to another. Find out if the operator cleaned the harvesting and/or tillage equipment used in this field to reduce or prevent the spread of pests to or from the selected field.

- If the operator used this practice to control pests, enter code “1” for “YES”.

### **Item 10j: Cultivation for Weed Control**

Determine whether this field was cultivated for weed control during the 2011 growing season after the crop was planted.

- If the operator used this practice to control pests, enter code “1” for “YES”.

### **Item 10k: Chose Crop Variety**

Find out if the operator considered pest resistance offered by different crop varieties in selecting the variety planted in this field. Certain varieties of a crop are more resistant to a pest than others.

- Enter code “1” for “YES”.

### **Item 10l: Planting Location Practices**

Another pest management practice is to determine where to plant a particular crop. Crop location can have a negative or positive impact on pest populations. As an example, a field next to wind break could create a pocket for insects or weeds. A wet shady area may harbor mold or a rot that could have a negative impact.

- If this practice was used, enter code “1” for “YES”.

### **Item 10m: Adjust Planting or Harvesting Dates**

Find out if the planting or harvest date was adjusted on this field for the purpose of controlling pests.

- If this practice was used, enter code “1” for “YES”.

### **Item 11: Weather data**

Weather can be a factor in determining either the ‘need for’ or ‘when to’ apply a pest management practice. Monitoring weather data allows the timing of applications to be adjusted to increase effectiveness, to allow for a lower application rate, reduce drift, or decrease the number of applications needed. For example, fungal diseases are more likely to occur during damp, cool conditions. A fungicide may not be needed when hot, dry conditions prevail.

- If this practice was used, enter code “1” for “YES”.

### **Item 12: Pest Identification and Management Training**

Ask if the operator has attended any training sessions on pest identification and management in the past 3 years.

- If “YES”, enter code “1”.

### **Item 13: Biological Pest Control**

Biological pest control methods make use of beneficial microbial organisms (such as Bt, viruses, and fungi) and agents such as attractants, repellants, and pheromones to control plant pests.

Ask if any products such as floral lures, insect attractants, repellants, pheromone traps, microbial organisms, or other biological pest control products were used in this field for the 2011 crop.

If “YES”, enter code “1”.

### **Items 14 - 16: Pesticide Application Decisions**

Operators rely on various sources of information when they decide whether to apply pesticides to their crop. Some apply pesticides as a routine preventive measure against pests. Some use scouting data to decide if a pesticide application is needed. Others receive a recommendation from their chemical dealer or crop consultant to make pesticide applications.

Show the Application Decision Code List to the respondent. Refer to the Chemical table in Section G, Item 8a to determine if any herbicides (4000 series in the chemical product code list), insecticides (1000 series in the chemical product code list), or fungicides (7000 series in the chemical product code list) were applied to the selected field in 2011.

If a herbicide was applied, complete Item 14.

If an insecticide was applied, complete Item 15.

If a fungicide was applied, complete Item 16.

If no pesticides were applied, go to Section G.

### **Item 14: Herbicide Application Decisions**

If herbicides were applied to this field in 2011, complete Item 14. Herbicides are coded as Series 4000 chemicals on the chemical product code list.

- Enter the code that represents the primary and secondary reasons the respondent relied on in deciding to apply herbicides in 2011.

### **Item 15: Insecticide Application Decisions**

If insecticides were applied to this field in 2011, complete Item 14. Insecticides are coded as Series 1000 chemicals on the chemical product code list.

- Enter the code that represents the primary and secondary reasons the respondent relied on in deciding to apply insecticides in 2011.

### **Item 16: Fungicide Application Decisions**

If fungicides were applied to this field in 2011, complete Item 14. Fungicides are coded as Series 7000 chemicals on the chemical product code list.

- Enter the code that represents the primary and secondary reasons the respondent relied on in deciding to apply fungicides in 2011.

## Section H - Irrigation

### What is Section H for? How is the Information Used?

Questions in Section H are designed to identify characteristics of the irrigation system(s) used on the selected field for the 2011, 2010, and/or 2009 crop years. Information obtained in this section is combined with other information to estimate soil erosion and nutrient and pesticide losses from the selected field.

Most irrigation methods use either pressurized or gravity-flow systems. Pressurized systems include various sprinkler or low-flow drip/trickle systems. Gravity-flow systems include various flood or furrow irrigation systems and subirrigation systems.

How water is applied depends on the crop, the physical features of the land (slopes, hills, and gullies), the type of soil, the amount of water available, how well special equipment would work, and the cost. To conserve both water and money, farmers try to control the amount of water applied and the distribution of water across a field. When crops are over-watered, minerals are washed from the soil, salts build up and soil erodes. When water is not applied uniformly across a field, crop yield is reduced.

There can be more than one type of irrigation system used on a crop field. Note: in some States, nonirrigated land may also be called "dryland".

The respondent should have reported in Section C, Item 1, Line 11 whether a crop was irrigated during any of the crop years in question.

## Item 1: Irrigation Systems

Include only the irrigation system(s) in use on the selected field for the 2011, 2010, or 2009 crop years.

**NOTE:** Don't list any system or irrigation technology that wasn't used on the selected field, even if it was used on other fields or other crops on the farm operation.

### Item 1a: Type of System

You will record information for only one system used on the selected field for each crop year. If more than one system was used, record the irrigation system which covered the majority of the field acres.

Refer the operator to the Irrigation System Types Codes in the Respondent Booklet and record the System Type Code for the irrigation system used to irrigate most of the acres of the selected field during the 2011, 2010, and/or 2009 growing seasons.

The Irrigation System Type Codes are:

#### Pressure Systems

**Code 1** - Hand-move

**Code 2** - Solid or Permanent Set

**Code 3** - Side Roll or Wheel Line

**Code 4** - Center Pivot or Linear Move With Impact Sprinklers

**Code 5** -Center Pivot or Linear Move Low Pressure Spray Nozzles below the tower and suspended above Ground Level

**Code 6** -Center Pivot or Linear Move With Spray or Bubbler Nozzles Discharging on or near Ground Level.

**Code 7** - Big Gun

**Code 8** - Low-flow Irrigation (Drip, Trickle, or Micro Spray)

**Code 9** - Other Pressure System -- Specify Type

**Gravity Flow Systems**

**Code 10** - Siphon-tube System from Unlined Ditches

**Code 11** - Siphon-tube System from Lined Ditches

**Code 12** - Portal- or Ditch-gate System from Unlined Ditches

**Code 13** - Portal- or Ditch-gate System from Lined Ditches

**Code 14** - Poly-pipe System

**Code 15** - Gated Pipe (Not Poly Pipe)

**Code 16** - Improved Gated Pipe (Surge Flow or Cablegation, Not Poly Pipe)

**Code 17** - Subirrigation

**Code 18** - Open Discharge from Well, Pump, Border (large scale turned structures, or large alfalfa valves)

**Code 19** - Other Gravity System -- Specify Type

Each of these irrigation systems is described in Exhibits 5.1 and 5.2 at the end of this section. The descriptions are designed to explain system characteristics and how the system applies the water to the field.

These systems are on-farm, field-level irrigation technologies and do not describe the water distribution systems of an irrigation district or company.

Exhibit 5.1 includes descriptions of end-tow sprinkler and carousel sprinkler-traveler systems. If either of these systems are used on the field, enter them as a side roll/wheel line system using a code "3".

Also provided are descriptions of several big-gun systems, including self-propelled big-gun system, reel-type hose pull and reel-type cable pull systems that use large gun-type sprinklers. Each of these systems should be entered as a big-gun system using a code "7".

**Flood irrigation is a gravity based irrigation system** where the water applied is allowed to flow across all or part of a field between levees, dikes, or borders. For water management and cost reasons, it is important to identify how the water is applied to the field. Therefore, the flood irrigation system type should be recorded depending on how the water is applied to the field. A flood irrigation system can consist of any gravity system type, except system type 17 (and it is also unlikely for system type 16).

For example, if the field was flood irrigated (the water applied is allowed to flow across the field between levees, dikes, or borders), and the water was applied to the field using a siphon tube or portal/ditch-gate system, then record the flood irrigation system type as either a 10, 11, 12 or 13. Record a code 10 if the field was flood irrigated by applying water from an unlined ditch using a siphon tube system, or a code 11 if the siphon tube system applied water from a lined ditch. Record a code 12 if the field was flood irrigated by applying water from an unlined ditch using a portal/ditch-gate system, or a code 13 if the portal/ditch-gate system applied the water from a lined ditch. If water is applied to the field through a single discharge from a well or pump and allowed to flood all or part of the field (between levees, dikes, or borders), code the irrigation system as 18.

- Enter the irrigation code for the appropriate year.

### **Item 1b: Change in System**

Ask the respondent if they made any major changes to the irrigation system to the selected field in 2009, 2010, or 2011. This includes a change in the type of irrigation system used, the source of water, a major change in the timing of when the water was applied, a major change in how the system was monitored, or any other major changes that would affect the irrigation system.

Take good notes of any changes the respondent mentions regarding made to the irrigation system.

- If the respondent made any major changes to the way the selected field was irrigated during the years 2009 - 2011, enter a "1" in the box for "Yes".

**[Enumerator Note: Gravity Irrigation System Used : If a gravity irrigation system (Codes 10-19) was reported in question 1a for any of the 3 years (2011, 2010, 2009) complete Items 2 and 3. ]**

**[If not, skip to question 4.]**

## **Item 2: Gravity Irrigation Systems**

Ask Item 2 for each year that a gravity flow irrigation system (Irrigation System Type Codes 10-19) was indicated in Item 1 as the gravity system source. The options are:

**Code 1 - Furrow** - Furrow irrigation is a surface irrigation system that applies water to the soil by allowing water to flow downslope, in evenly spaced channels. Furrow irrigation systems may be graded or level. Water infiltrates into the soil along the furrows.

**Code 2 - Border** - Border irrigation is a system where the field is divided into strips of uniform width and grade by parallel dikes or border ridges. Each strip is irrigated separately. Water is introduced at one end and progressively covers the entire strip.

**Code 3 - Basin** - Basin irrigation requires that the field be surrounded on all boundaries by a control buffer, such as a dike or levee, forming a basin that can be flooded to provide irrigation. Basin irrigation has been used for many years to irrigate orchards, alfalfa, small grains, and pastures.

**Code 4 - Contour Levee** - Contour levee irrigation is similar to basin irrigation, except the water is retained by small dikes or levees within the field that are constructed generally on the contour. Rice is an example of using contour levee irrigation.

**Code 5 - Meadow or Wild Flood** - Meadow or Wild Flood is a system of using seasonal runoff or high flow diverted into meadow or mountain pastures to fill the soil profile. Flows are generally diverted with minimum use of structures and may consist of contour ditches checked periodically to allow flow to overtop the ditch and flow down the slope in an uncontrolled or unregulated manner.

- Enter the correct item code for a gravity irrigation system water source.

### **Item 3: Water Management Practices to Improve Efficiency**

Ask the operator if any water management practices were used to reduce irrigation water use or improve efficiencies during the 2011, 2010, and/or 2009 crop years.

- Enter a “1” for “YES” in the appropriate cell for each year water management practices were used. If “YES” for any year, continue to item 3a. If “NO” for every year, go to item 6.

#### **Item 3a: Poly-acrylamide (PAM) Applied to Water Delivery System**

Agricultural poly-acrylamide (PAM) is an organic polymer that can be used to reduce soil erosion when mixed with irrigation water.

Commercially manufactured agricultural PAM comes in granular and liquid formulations. When added to irrigation water, poly-acrylamide coats soil particles and forms soil clumps that settle in field furrows which reduces the soil moved by the irrigation water, and it allows increased furrow stream size (flow rate) without causing erosion.

- If poly-acrylamide (PAM) was applied to the water delivery system, enter a “1” for “YES” for each year that it was applied.

#### **Item 3b: Slope of the Field Adjusted to a Specific Grade**

Ask the producer if the grade of the selected field was adjusted to a specific grade during 2011, 2010, and/or 2009. Include zero slope as a specific grade.

The slope of an agricultural field may be changed or altered to allow a more efficient use of irrigation water, reducing the slope or grade of a field will slow down the rate at which water moves across a field.

- Enter a “1” for “YES” for each year the slope of the selected field was adjusted.

**Item 3b(1): Laser Leveling Used to Change Slope**

If 3b = “YES”, then ask 3b(i).

Laser leveling involves using laser directed equipment to level the field to a specific grade. Using lasers are more accurate than using other methods. Laser leveling may be called precision leveling.

- If laser leveling was used on the selected field in the 2011, 2010, and/or 2009 crop years, enter a “1” in the appropriate cells.

**Item 3b(2): Slope Adjusted as Part of Conservation Plan**

If 3b = “YES”, then ask 3b(ii).

- If the slope or grade of the field has been adjusted as part of a conservation plan, no matter in what year it was adjusted, enter a “1” in the cell.

**Item 3c: Other Practices to Improve Efficiency**

If Item 3 = “YES”, ask the operator if any other practices were used to reduce irrigation water use or improve efficiency. Use the list provided in the Respondent Booklet. If a practice used to improve efficiency is not listed, write in below the box. The office staff will contact HQ for further instruction on coding.

- If “YES”, enter a “1” in the appropriate cell and list the practices in the boxes provided.

**[Enumerator Note: Pressure Irrigation System Used : If a pressure irrigation system (Codes 1-9) was reported in question 1a for any of the 3 years (2011, 2010, 2009) ask Item 4 and Item 5.**

**[If not, skip to question 6.]**

**Item 4: Year Pressure System Installed**

- Record the year that the pressure irrigation system used on the selected field was installed.

### Item 5: Year Pressure System Refurbished

- Record the latest year that the pressure irrigation system used on the selected field was refurbished.

### Item 6: Field Runoff

Refer the operator to the list of field runoff options in the Respondent Booklet and record the code that the operator indicates best describes what happens to the **majority** of the runoff from irrigation for the selected field by crop year.

Field runoff is the portion of the irrigation water applied to the field that does not soak into the soil where the crop is growing. This 'extra' water flows across a field and either collects to form a pool at the end of the field, or it flows off the field. The pool of extra water is not large enough or doesn't last long enough to prevent normal farming operations for the field.

This question is a multiple choice question. Be sure to read ALL of the items in the Runoff Code List before accepting an answer from the respondent. The respondent may want to answer before hearing all the possible answers, and one of the later codes may be the best answer.

Do not ask "Was there any runoff from this field?" or "What happens to the runoff from this field?". These questions are not correct. Many operators may initially say there is no runoff. The respondent may not consider other acceptable answers if you don't read ALL of them before accepting an answer.

The codes describing field runoff are:

**Code 1 - Retained at the End of the Field with No Reuse:** This is when the pool of extra water is held at the end of the field because the field is bordered or there is a natural basin at the end of the field. The runoff is not reused for irrigation.

**Code 2 - Retained at the End of the Field and Reused to Irrigate on the Farm:** Extra irrigation water from the field collects in an on-farm lake, pond, or pit below the field, and is reused to irrigate the same field or another field on the farm.

**Code 3 - Collected in Evaporation Ponds on the Farm:** The extra irrigation water collects in an on-farm pond or pit below the field and is not re-used for irrigation. Instead, it remains in the pond or pit until it evaporates. Evaporation ponds are sometimes used for disposal of poor quality drainage flows.

**Code 4 - Drains from the Farm:** Runoff drains off the field and away from the farm through man-made drainage ditches or natural water courses. Runoff drained from a farm may be recovered by another farm or it may reenter the water supply downstream as return flow.

**Code 5 - No Runoff:** Irrigation water is applied to the field so that no extra water collects at the end of the field or drains from the field.

- Enter the corresponding runoff code.

#### **Item 7: Irrigation and Salinity Problems on the Selected Field.**

Irrigation water is sometimes used to flush the buildup of salts from the soil profile to prevent loss of crop yields. Most crops have a low tolerance to salt concentrations in the soil. The purpose of this question is to determine if salinity is an issue associated with crop production on the selected field.

- If “YES”, enter “1”. Otherwise “blank”. Go to Section I.

**Exhibit 5.1: Types of PRESSURE Irrigation Systems**

<p><b>Hand-move Sprinkler System</b>  (Code 1)</p>	<p>Portable pipe system, usually aluminum pipe, which must be moved by hand one or more times per day during irrigation periods. Irrigation requirements of the field are met by successive moves of the system to water one strip of the field at a time (an irrigation set). The system's sprinklers can use a variety of orifice sizes and configurations. The system may be adapted to most soil types, topography, field size and shapes; however, it is not suited for all crops since tall crops, such as corn, hinder pipe movement. The sprinkler line(s) are served water by mainlines of aluminum or PVC that may be buried or above ground.</p>
<p><b>Solid-set or Permanent Sprinkler Systems</b>  (Code 2)</p>	<p>A buried pipe system with only the risers and sprinklers above ground, or a portable pipe system which is placed in the field at the start of the irrigation season and left in place to the season end. Both of these system types require no labor to move the system to a new location once established for the irrigation season. Adapted to most crops, soil types, topography, field sizes and shapes.</p>
<p><b>Side-roll or Wheel-line Sprinkler Systems</b>  (Code 3)</p>	<p>A wheel-move, lateral-line system which moves as a unit in fixed increments (irrigation sets) across the field. The system is powered by a small gasoline engine that is manually operated. The system is stationary while irrigation is taking place. Some variations of the system may have tow lines trailing the main lateral line with additional sprinklers on each tow line. Tow line systems irrigate a wider strip at each set, up to 180 feet compared to the 60-foot strip of standard side-roll systems. Wheels are generally spaced 40 feet apart and are 5-7 feet in diameter, with the main system pipe serving as an axle in the middle of the wheel. The system is designed for reasonably flat, rectangular or square fields and is suited to crops less than 4 feet in height. The sprinkler may use flexible hose, aluminum pipe, or PVC pipe to connect to mainlines (above or below ground) or on-site pressurization pumps.</p>
<p><b>End-tow Sprinkler System</b>  <i>INCLUDE as a side-roll system (Code 3)</i></p>	<p>Wheel or skid, lateral-line system which is end-towed via tractor to new locations in the field. The system is stationary while irrigation is taking place. The system is designed for reasonably flat or slightly rolling, rectangular or square fields with an alley through the center of the field. Designed for hay and pasture irrigation, the system may be used on some row crops and orchards.</p>
<p><b>Carousel Sprinkler-traveler System</b>  <i>INCLUDE as a side-roll system (Code 3).</i></p>	<p>Wheel-mounted system with a rotating boom that sprinkles or sprays water. The system may be self-propelled with a mounted engine, or towed via pick-up or tractor to the next field location (irrigation set). Water is supplied to the system by hose or supply ditch.</p>

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### Center Pivot or Linear Move with Impact Sprinklers

(Code 4)

Self-propelled, continuous-move sprinkler system that either travels in a circle (center pivot) or laterally (linear move) across a field. Sprinklers are located **directly on** the system's main water-supply pipe, which is supported by A-frame towers. Some circle systems have features that provide coverage of most of the corners on a square field. Some systems may be towed to adjacent fields to increase system use by irrigating a different crop with different timing of water needs. Water is delivered to a fixed center point for center-pivot systems and by hose or supply ditch for lateral move systems. Center-pivot systems have been developed for areas from 40 to 240 acres, but most systems irrigate 128 to 132 acres of a square 160 acre field. Lateral moves require a square or rectangular field of 40 to 240 acres. These systems may be adapted to most crops, soil types, and level to gently-rolling topography. Systems with sprinklers **directly** on the main water-supply line will tend to be **medium to higher pressure** (above 30 psi) and use impact sprinklers.

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### Center Pivot or Linear Move, with low pressure spray nozzles below the Tower and suspended above Ground Level

(Code 5)

Self-propelled, continuous-move sprinkler system that either travels in a circle (center pivot) or laterally (linear move) across a field. Sprinklers or sprayers are located on drop-tubes or booms suspended **below** the system's main water-supply pipe, but **more than 2 feet above the ground**. This includes most standard drop-tube sprinkler systems. Some circle systems have features that provide coverage of most of the corners on a square field. Some systems may be towed to adjacent fields to increase system use by irrigating a different crop with different timing of water needs. Water is delivered to a fixed center point for center-pivot systems and by hose or supply ditch for lateral move systems. Center-pivot systems have been developed for areas from 40 to 240 acres, but most systems irrigate 128 to 132 acres of a square 160 acre field. Lateral moves require a square or rectangular field of 40 to 240 acres. These systems may be adapted to most crops, soil types, and level to gently-rolling topography. Systems with sprinklers **below** the main water-supply line will tend to be **lower pressure** (below 30 psi), with spray nozzles rather than impact sprinklers.

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### Center Pivot or Linear Move, with Spray or Bubbler Nozzles discharging on or near Ground Level

(Code 6)

Self-propelled, continuous-move sprinkler system that either travels in a circle (center pivot) or laterally (linear move) across a field. Sprinklers or sprayers are located on drop-tubes suspended **below** the system's main water-supply pipe and are located less than 2 feet above the ground. This includes low pressure precision application systems (LEPA) and other below-the-crop-canopy systems. Some circle systems have features that provide coverage of most of the corners on a square field. Some systems may be towed to adjacent fields to increase system use by irrigating a different crop with different timing of water needs. Water is delivered to a fixed center point for center-pivot systems and by hose or supply ditch for lateral move. Center-pivot systems have been developed for areas from 40 to 240 acres, but most systems irrigate 128 to 132 acres of a square 160 acre field. Lateral moves require a square or rectangular field of 40 to 240 acres. These systems may be adapted to most crops, soil types, and level to gently-rolling topography. Systems with sprinklers **suspended to within 2 feet of the ground** tend to be **very low pressure** (below 15 psi) and use spray nozzles and bubblers. Some units may run water directly on the ground using a cloth-like extension attached to the drop tube.

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<b>Big Gun</b> (Code 7)	A single, large gun-type sprinkler mounted on a trailer, carriage, or skid. Water is supplied to the sprinkler through a flexible hose. The mounted gun sprinkler is either pulled across a field or moved across a field using a self-propelled drive system for each irrigation set. An irrigation set is the area of the field that is irrigated by the gun sprinkler as it moves across the field. When an irrigation set is completed, the entire system is moved and the process repeated. The system is designed for straight rows, flat topography, and medium to high infiltration soils. It is best suited for crops that can withstand heavy bursts of water. Systems are high pressure, greater than 60 psi. Three specialty-type big-gun systems are defined below, including a self-propelled gun traveler system, a reel-type hose pull system, and a reel-type cable pull system.
<b>Self-propelled Gun Traveler</b>	Single, large gun on a four-wheel trailer. Self propelled by a separate engine or a hydraulic continuous move. Water is supplied through a flexible hose. Systems are high pressure, greater than 60 psi. <i>INCLUDE as a big gun system (Code 7).</i>
<b>Reel-type Hose Pull</b>	Single, large gun-type sprinkler on a carriage. A flexible, but noncollapsible hose is attached to a large reel at one end of the field. The carriage and sprinkler is attached to the unrolled hose and stationed at the other end of the field. Water movement through the hose activates a drive system that rolls the hose on the reel, drawing the sprinkler and carriage across the field. When an irrigation set is completed, the reel, sprinkler, and carriage may be moved and the process repeated. Systems are high pressure, greater than 60 psi. <i>INCLUDE as a big gun system (Code 7).</i>
<b>Reel-type Cable Pull</b>	Similar to hose-pull system, except a cable is used to reel the gun-type sprinkler and carriage across the field. This enables a flexible, collapsible hose to be pulled behind the carriage. When an irrigation set is completed, the cable, reel, hose, sprinkler, and carriage may be moved and the process repeated. The system often requires a grass strip to operate on since the hose is pulled behind the unit. Systems are high pressure, greater than 60 psi. <i>INCLUDE as a big gun system (Code 7).</i>
<b>Low-flow Irrigation System</b> (Drip, Trickle, Micro spray) (Code 8)	Low-pressure systems designed for frequent water applications using small-diameter tubing and low-volume emitters to distribute water directly to the crop root zone. Tubing and emitters can be installed below ground, under plastic or mulch, or above ground, and alternatively, tubing may be installed below ground with emitters on risers above ground. While used primarily on trees, vines, and vegetable crops, these systems are only in limited use on field crops due to the high initial capital costs. Drip and trickle systems have been adapted to all crop types; micro-sprinklers are generally used on perennial crops where a larger wetted area is needed to encourage root development. These systems are adaptable to most soils and may be used on topography where slope prevents irrigation from other system types.

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### Exhibit 5.2: Types of GRAVITY-FLOW Irrigation Delivery Systems

<b>Siphon-tube System with Unlined Ditches</b>  (Code 10)	System uses short curved tubes, usually aluminum or plastic, to siphon water onto a field from an <b>unlined</b> ditch across the head of the field. Siphon tubes are curved to fit over the ditch bank and most range from 1 to 3 inches in diameter and from 3 to 5 feet in length. Water, once on the field, may flow down furrows, between borders or dikes, or in corrugations. The unlined ditch is formed with mechanical operations using only the soil on the field. The ditch may be reformed each year or reused with maintenance.
<b>Siphon-tube System with Lined Ditches</b>  (Code 11)	System uses short curved tubes, usually aluminum or plastic, to siphon water onto a field from a <b>lined</b> ditch across the head of the field. Siphon tubes are curved to fit over the ditch bank and most range from 1 to 3 inches in diameter and from 3 to 5 feet in length. Water, once on the field, may flow down furrows, between borders or dikes, or in corrugations. The ditch may be lined with concrete, plastic, clay, or other nonporous material. The ditch is permanent and is reused each year.
<b>Portal- or Ditch-gate System with Unlined Ditches</b>  (Code 12)	System uses openings in the ditch bank, either portals with covers or tubular openings closed with a gate, to discharge water onto a field from an <b>unlined</b> ditch across the head of the field. Portals in the ditch bank can be of any diameter and are covered with a metal, plastic, or wood cover to regulate water flow onto the field. Ditch openings can be any size, including openings for the entire flow of the ditch, and water-flow control gates can be made of wood, metal, plastic, or canvas. Water, once on the field, may flow down furrows, between borders or dikes, or in corrugations. The unlined ditch is formed with mechanical operations using only the soil on the field. The ditch may be reformed each year or reused with maintenance.
<b>Portal- or Ditch-gate System with Lined Ditches</b>  (Code 13)	System uses openings in the ditch bank, either portals with covers or tubular openings closed with a gate, to discharge water onto a field from a <b>lined</b> ditch across the head of the field. Portals in the ditch bank can be of any diameter and covered with a metal, plastic, or wood cover to regulate water flow onto the field. Ditch openings can be any size, including openings for the entire flow of the ditch, and water-flow control gates can be made of wood, metal, plastic, or canvas. Water, once on the field, may flow down furrows, between borders or dikes, or in corrugations. The ditch may be lined with concrete, plastic, clay, or other nonporous material. The ditch is permanent and is reused each year.
<b>Poly Pipe System</b>  (Code 14)	A system using a flexible, collapsible, plastic (polyethylene) tube up to 18 inches in diameter. The poly-tubing is unrolled along the head of the field and holes punched or closeable gates installed to match furrow, border, or dike width. A well or supply canal provides water to the tube. The tube is installed at the beginning of the irrigation season, and since it lays flat when not in use, can remain in the field the entire season. The tubing may be reused for more than one year, but single season use is most common.

<b>Gated Pipe (Not Poly)</b>  (Code 15)	A system using rigid PVC plastic or aluminum pipe with manually-operated closeable gates at regular intervals. The pipe is installed at the head of the field, but may need to be removed for cultural operations or moved to new field locations through the season. The gates usually match row widths so water can flow directly into rows. Gated-pipe systems may also be used on flood or corrugation water-control systems. The pipe is reused for many years.
<b>Improved Gated Pipe System</b> (Surge Flow or Cabledation, Not Poly)  (Code 16)	A system using rigid PVC plastic or aluminum pipe with manually-operated closeable gates at regular intervals, but with an <b>automated water-control system</b> . Automated water control is achieved by (1) using a surge valve to alternate pipe sets receiving water, (2) using a moveable plug inside the gated pipe, controlled by a cable, to adjust the water flow from open gates, or (3) other automated methods using gated pipe to control water flow and improve the uniformity of water applications, such as pneumatically controlled bladders to regulate water flow on individual gates. Gated pipe is installed across the head of the field, but may need to be removed for cultural operations or moved to new field locations through the season. The gates usually match row widths so water can flow directly into rows. Improved gated pipe is very unlikely to be used for flood irrigation. It would defeat the purpose of the improved system. The pipe is reused for many years.
<b>Sub-irrigation</b>  (Code 17)	Maintenance of a water table at a predetermined depth below the field surface by using ditches or sub-surface drains and water-control structures. Water is added or removed as needed to maintain the water level of the water table at a specific depth using the ditches or drains. Lateral movement of water through the soil provides water to the crop root zone. Conditions for use of this system are limited. Land must be flat and suitable for rapid lateral water movement. The irrigation system may also be used as a drainage system.
<b>Open discharge from well, pump, large scale turnout structures or large alfalfa valves.</b>  (Code 18)	Open discharge from well or pump occurs where there is only one point of discharge into the field. This system is often used in conjunction with levees or dikes to maintain an even water depth throughout the field. The water remains on the soil until irrigation needs are met, at which time the water is either drained from the field or allowed to infiltrate the soil. Land forming is often required with this system.

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## Section I - Field Operations

### What is Section I for? How is the Information Used?

Information collected in the Field Operations section is used to identify tillage systems and crop residue levels. Factors that are important in estimating soil erosion, as well as nutrient and pesticide losses, include the amount of disturbance to the soil during planting and tillage operations.

This section will obtain the information needed to address these factors. This allows examination of the impact of the conservation compliance provisions of the most recent Farm Bill on tillage systems, cropping practices, and crop residue levels.

### Field Operations Table

**The 2011 questionnaire includes year specific tables for each of the crop years included in the survey. The year is preprinted in column 1. If additional lines are necessary to complete the field operations for any given crop year, use the year specific table provided in the supplement. DO NOT put 2 different crop years on one table.**

Use the checklist at the top of the field operations table to insure the proper operations are recorded.

Obtain all equipment operations for the 2011, 2010, and 2009 crop years for the selected field. Start after the harvest of the previous crop year and continue *through harvest of the crop planted*. Custom operations are included.

**Exclude** equipment used to apply lime or gypsum. **Exclude pesticide and fertilizer applications.** Exclude hauling of the harvested crop from the sampled field. Exclude work done outside the select field, for example in field borders.

### **Where to Start?**

Most operators find it easiest to report the 2011 crop year field operations first, and work their way backwards to the 2009 crop year.

Introduce the topic to the respondent by reading the introductory statement and instructions (“Begin with the first field operation after harvest of the previous crop year,” etc...).

After making sure the respondent understands which operations to report, begin by asking the respondent what happened after the previous crop was harvested from this field. In most cases, this will be the first tillage operation after harvest of the previous crop from this field.

Review the checklist as data are being reported and after completing the Field Operations Table. This will insure whole categories of field operations are not omitted.

Record the field operations in the order that they were performed by crop year. Each crop year should begin with sequence number “1”.

### **Using the Field Operations Supplement**

The Field Operations Supplement includes year specific pages for the survey and should only be used if additional lines are needed to capture all field operations. Copy the identifications as it appears on the questionnaire to the identification box on the supplement.

It is imperative that field operations are recorded on the corresponding year specific table. Do not use more than one supplement per year.

### Item 1: Field Operations

Record field operations performed by equipment in the order they occurred each crop year.

- If a crop was grown, begin with the first operation after the previous crop year commodity was harvested.
- If the crop is planted in the fall and harvested in the spring, the Crop Year = year that the crop is harvested. Record the crop on the Operations Table of the year that the crop is harvested.
- If a cover crop was grown, begin with the first operation after the previous year's crop was harvested. Often, cover crops are planted in the fall and terminated in the spring. Record the cover crop on the Operations Table of the year that it is removed or terminated. Include all operations required to produce the cover crop, including planting, maintaining and removing/terminating the cover crop.
- If a crop was planted but abandoned, and then another crop was planted in the same crop year, record all field activities for both crops during the crop year.

Start by asking what happened after harvest of the preceding crop year and then keep going in the order that the operations were performed. The sequence of operations and implements must be numbered accurately because it is very important for determining residue levels.

Each crop year should begin with a sequence number of "1". For example, in crop year 2011, the sequence numbers for field operations for our sampled field had 1, 2, 3, 4, and 5. For the 2010 crop year, our numbering would begin again with a "1" being the first operation followed by the remaining sequence numbers, until we begin the 2009 crop year which again would begin with a sequence number of "1".

Try not to leave blank lines between operations because of the limited space in the table.

**NOTE:** Include field operations done by neighbors, friends, etc. on a "swap" basis.

After recording operations through planting, continue to list the operations through harvest from this field. Record operations in the order they occurred AND maintain the order of tandem hook-ups. Enter the SEQUENCE

NUMBER of each operation in the order it occurred. List all implements used on this field *beginning with the first trip over the field after harvest of the preceding crop* and *continuing through harvesting from the field*.

**Include:**

- plowing,
- corrugation,
- land preparation,
- planting,
- harvesting operations,
- hauling within field boundaries,
- custom operations, and
- residue management.

**Exclude:**

- applications of lime and gypsum,
- fertilizer, manure and pesticide applications, and
- hauling operations from field edge to storage.

In sequential order, record all operations performed by tillage, land forming, and harvesting.

If any of the cropped acres in the selected field were abandoned, all field work done on these acres should still be included. **Include** the activity of plowing these acres under. If the operator re-seeded acres to another crop, include all operations for the crop year.

**Exclude** hauling from field edge to barns, grain bins, dryers or cleaners, and any other location from this field.

It may help to review the checklist to insure that no field operations were missed.

## Completing the Field Operations Table

### Column 1: Crop Year

This column is preprinted with each of the crop years included in the survey.

### Column 2: Operation Sequence Number

Correct sequence of the operations over the selected field must be maintained. Enter the SEQUENCE NUMBER of each operation, beginning with number “1” for the first operation after harvest of the previous crop for each crop year.

Record the field operations in the order that they were performed by crop year.

Implements in tandem hook-ups should be entered on separate lines. For a tandem or multiple hookup of individual tillage implements, record the first implement of the set in Column 4 and its implement code in Column 5. When you record the second implement on the next line, keep the same SEQUENCE NUMBER in Column 2 that was entered for the first implement in the set. If more than two implements are in such a set, list them in the appropriate hookup order, each one on its own line, and record the same SEQUENCE NUMBER for all the implements in that same set.

For example, you’ve just enumerated the first operation (a chisel plow) on the selected field. Then for the next operation, the operator tells you that he used a flex-tine tooth connected to a field cultivator. After this operation, the respondent reported that he planted. You would record this as follows:

**Example 2: Recording operation sequence numbers**

1	2	3	4	5	
Crop Year	Sequence Number	Crop Name	What crop was associated with this operation?	Machine Code <small>[Record machine code from Respondent Booklet.]</small>	
YEAR	Number		CODE	CODE	
2011	1	soybeans	26	chisel plow	01
2011	2	soybeans	26	field cultivator	21
2011	2	soybeans	26	flex-tine tooth	33
2011	3	soybeans	26	conventional planter	114

Sometimes the respondent forgets to report an operation in its right order. When this happens, just add the forgotten operation wherever you are in the table when it is remembered, and enter its correct SEQUENCE NUMBER. Then go back and change the sequence numbers you previously entered to reflect the correct order of machine operations. BE SURE to correct all SEQUENCE NUMBERS that are affected. The cell numbers do not have to be changed to correspond to the corrected order, only the SEQUENCE NUMBER entered in Column 2.

This is much simpler than erasing and reentering in the correct order all the operations you had already recorded in Column 5.

For example, you have entered operations 1, 2 and 3 in the previous example, when the operator recalls another operation (a soil finisher) that occurred after the tandem tillage operation and before the planting operation. Correct the SEQUENCE NUMBERS and continue recording operations in order as follows:

**Example 3: Correcting operation sequence numbers**

1 Crop Year	2 Sequence Number	Crop Name	3 What crop was associated with this operation?	4 What operation or equipment was used on this field?	5 Machine Code  <i>[Record machine code from Respondent Booklet.]</i>
YEAR	Number		CODE		CODE
2011	1	soybeans	26	chisel plow	01
2011	2	soybeans	26	field cultivator	21
2011	2	soybeans	26	flex-tine tooth	33
2011	<del>3</del> 4	soybeans	26	conventional planter	114
2011	3	soybeans	26	soil finisher	66
2011	5	soybeans	26	"	66
2011	6	soybeans	26	"	66

**Column 3: Crop Code**

- Record the crop or land use code from the Respondent Booklet for each field operation. These codes should reflect the crop(s) in the selected field and identified in Sections C, D, E and/or F.

**Column 4: Operation or Equipment Used**

- Record either the operation or the equipment the operator reported, such as a plow, disk, harrow, planter, etc. Continue recording operations or equipment used following planting, such as a cultivator, combine, etc. If the operator reports using a machine for which a code is not available, ask the operator which one of the implements in the Respondent Booklet best describes it, or describe the machine as completely as possible in notes.

Enter the name of each implement used on a separate line. Each line entry should indicate one complete pass over the field.

Do not leave blank lines due to limited line space. One of the last entries for each crop year should be equipment used for harvesting the crop from the field and hauling to the field edge. Include custom operations.

If more operations were completed on the selected field than there are lines available on the questionnaire, use the YEAR SPECIFIC FIELD OPERATIONS SUPPLEMENT. Copy the identification as it appears on the main questionnaire to the identification box on the supplement. Continue enumerating operations (numbered in sequential order in each crop year) on the SUPPLEMENT.

### Column 5: Machine Code

For each operation SEQUENCE NUMBER in Column 2, record the appropriate implement in Column 4 and the appropriate code in Column 5. The codes are listed in the Respondent Booklet. If the implement is not listed in the Respondent Booklet, write a description of that implement in notes on the questionnaire. Probe to see if any names in the Respondent Booklet may be applicable.

For a tandem or multiple hookup of individual implements, record each implement of the set in separate lines and enter the appropriate implement code in Column 5. Maintain the order of tandem hook-ups. Retain the same SEQUENCE NUMBER in Column 2.

Treat the attachment of two implements of the same type (for example, two plows hooked side-by-side) for the purpose of allowing wider coverage with one pass over the field as one implement, **not** as a tandem or multiple hookup.

Implements that have several tillage components attached to a single frame should be recorded as one implement, not as a tandem or multiple hookup. For example, a "do-all" is a single implement that has disk blades, field cultivator shanks, and some type of harrow mounted on a single frame. Enter the appropriate code for the single implement from the Machinery Code List in the Respondent Booklet.

Only one code should be entered in Column 5, for example, enter code 5 for a moldboard plow.

If an implement is not included in the Machinery Code List in the Respondent Booklet, enter the implement name on the appropriate line in Column 4, and briefly describe the implement in notes. Be as complete as

possible in your description. The equipment will have to be coded in the Field Office based solely on what you record.

PROBE for the specific type of implement so that it can be coded correctly (for example, plow = regular chisel plow; disk = tandem disk; harrow or drag = spike tooth harrow).

### **Column 6: Date of Operation**

Record the number of the month, day, and year when the operation was performed. Use the six digit MM DD YY format for recording the month, day, and year number. For example, if the respondent indicates that an operation was completed in early April 2011, have the respondent reference the calendars provided in the respondent booklet to provide their best estimate of the date that the operation occurred.

- Once a date is indicated, record as 0 4 0 3 1 1

### **Column 7: Depth of Tillage/Planting Operations**

When implements that are included in Columns 4 (operation or equipment used) & 5 (Machine Code) that disturb the soil, the depth of soil disturbance should be recorded in Column 7. This would include equipment used for cultivation, tillage, planting, and even harvesting in some cases (root crops).

Usually the respondent can report how far down the soil is disturbed or dug for individual equipment (equipment settings) activities.

- Record the depth of the tillage operation on the sampled field to the nearest tenth of an inch (1/10).

### **How to Record Tandem Field Operations**

Often farmers perform two or more field operations at the same time. A common example of this is a spike tooth harrow connected to a regular tandem disk, pulled by one tractor.

When a farmer reports a tandem field operation:

1. Record the first piece of equipment just like any single machine field operation. Record the SEQUENCE NUMBER in Column 2 in order from the previous operation. Enter the data for all remaining columns on that line.
2. On the next line, record the tandem operation in Column 4 and the machinery code of the second piece of equipment in Column 5. Record the same SEQUENCE NUMBER as the operation entered on the previous line in Column 2.
3. If more than two pieces of equipment were used in tandem, repeat step 2 for each additional piece of equipment.

Be sure each required column is completed for every piece of tillage and/or planting equipment used to prepare and plant the sampled field.

### How to Record Replanting Situations in Field Operations

Often farmers will replant a crop or plant a different crop when a weather related event (i.e. drought/hail storm/flood) destroys the first crop.

#### Example: Cotton Hailed out, Soybeans Replanted

1 Crop Year	2 Sequence Number	Crop Name	3 What crop was associated with this operation?	4 What operation or equipment was used on this field?	5 <i>[Record machine code from Respondent Booklet.]</i>	6 What was the timing of the field operation?	7 What was the depth of tillage/planting operations?
YEAR	Number		CODE		CODE	MMDDYY	INCHES
2011	1	cotton	281	chisel plow	01	022111	5.0
2011	2	cotton	281	field cultivator	21	032911	1.0
2011	2	cotton	281	flex-tine tooth	33	032911	.5
2011	3	cotton	281	conventional planter	114	040111	1.0
2011	1	soybeans	26	light disk	11	070111	3.0
2011	1	soybeans	26	planter	114	070111	1.5
2011	2	soybeans	26	harvester	123	101111	--

When recording either the replanting of the original crop or the planting of a substituting crop, the field operations that occurred for both should be recorded. These same crops should be captured for the appropriate year in Section C, Item 1.

The objective is to capture all the activity that occurred on the property itself. Capturing all the machinery that moved across the field during the crop year can help identify soil compaction issues, additional (or lack of) field work because of weather conditions, erosion, etc. When combined with the weather data already available for the field, this information allows the agronomists to identify the reality of production activities.

**Example: Cotton Hailed Out, Cotton Replanted**

1	2	3	4	5	6	7	
Crop Year	Sequence Number	Crop Name	What crop was associated with this operation?	What operation or equipment was used on this field?	<i>[Record machine code from Respondent Booklet.]</i>	What was the timing of the field operation?	What was the depth of tillage for tillage/planting operations?
YEAR	Number		CODE		CODE	MMDDYY	INCHES
2011	1 2	cotton	281	chisel plow	01	022111	5.0
2011	2 3	cotton	281	field cultivator	21	032911	1.0
2011	2 3	cotton	281	flex-tine tooth	33	032911	.5
2011	3 4	cotton	281	conventional planter	114	033011	1.0
2011	4 5	cotton	281	field cultivator	21	042011	1.0
2011	5 6	cotton	281	planter	114	042011	1.0
2011	6 7	cotton	281	cultivator	123	61111	1.0
2011	7 8	cotton	281	harvester	219	110111	–
2011	8 9	cotton	281	boll buggy	221	110111	–
2011	9 10	cotton	281	module builder	212	110111	–
2010	1	cotton	281	chopper	211	112810	–

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The example provided below shows how to record a field that is strip cropped with alfalfa and corn. In this case the corn production practices are no-till and only one alfalfa cutting occurred. The alfalfa was planted 3 years prior.

**Example: Strip Cropping, Alfalfa & Corn**

1 Crop Year	2 Sequence Number	Crop Name	3 What crop was associated with this operation?	4 What operation or equipment was used on this field?	5 <i>[Record machine code from Respondent Booklet.]</i>	6 What was the timing of the field operation?	7 What was the depth of tillage/planting operations?
YEAR	Number		CODE		CODE	MMDDYY	INCHES
2011	1	corn	6	no-till planter	105	042011	2.0
2011	2	corn	6	combine	122	100211	--
2011	3	corn	6	cart	209	100211	--
2011	1	alfalfa	1	self-p mower	151	71111	--
2011	2	alfalfa	1	rake	157	71211	--
2011	3	alfalfa	1	baler	148	71311	--
2011	4	alfalfa	1	wagon	195	71311	--

## Section J - Whole Farm

### What is Section J for? How is the information used?

The questions in this section are used to categorize farms according to size.

Data in this section refers to the **entire farming operation**, not just on the selected field as in previous sections.

All questions involving acres need to be answered to the nearest tenth acre (1/10).

### Item 1: Total Acres on the Entire Farming Operation in 2011

#### Include:

- (1) all acres owned and all acres rented from others.
- (2) all cropland, woodland, wasteland, wetland, pasture, idle land, and government program land regardless of location, **if the operator made the day-to-day decisions for that land**. If an operator living in one State made the day-to-day decisions for land across State lines, that land **should** be included in this section. Also include land for homesteads, barns, livestock pens, and ponds.
- (3) land worked by sharecroppers. Sharecropper operations are considered part of the landlord's operation. A sharecropper is a worker who furnishes ONLY LABOR (his own and often that of his family) for a share of the crop. Sharecroppers generally furnish no machinery, seed, fertilizer, etc.
- (4) all land (owned or rented) used by a son or daughter for 4-H or FFA projects, if the parent's equipment are used.

**Item 1a: Acres Owned**

**Include:**

- (1) land held by the operator and/or spouse and/or dependent children under title, purchase contract, homestead law, or as an heir or trustee of a divided estate.
- (2) cropland, woodland, wasteland, wetland, pasture, idle land, government program land, orchards and vineyards.
- (3) land which is not currently used for agricultural purposes.
- (4) all land owned and enrolled in government programs (acres in the Conservation Reserve Program (CRP), Wetlands Reserve Program (WRP), and other diverted land.)

**Exclude:**

all non-agricultural land separate from the operation that is permanently withdrawn from agricultural uses. This includes land in sub-divisions, commercial buildings, etc.

- Enter the total acres owned by this operation.

**Item 1b: Acres Rented From Others**

Farm/ranch operators often do not consider non-cropland acres such as woodland, wasteland and wetland to be part of rented acreage even though the landlord considers the whole parcel rented. Rent is usually based on the number of acres of cropland or pasture land. However, if the renter was responsible for looking out for the owner's interest in the woodland, wasteland and/or wetland, these acres should be included as acres rented from others.

**Include:**

All land rented from private individuals, partnerships, corporations, federal, State or local governments, Indian Reservations, railroads, etc., if the operation:

- (1) paid cash rent on a per acre basis.
- (2) paid for use of the land with a share of the crops (either standing or harvested).
- (3) paid for use of the land with a share of livestock production.
- (4) had free use of the land.

**Exclude:**

- (1) any land used as pasture or for grazing livestock if payment was on a per head or Animal Unit Month (AUM) basis.
  - (2) land on which the respondent's livestock were fed under a contract (for example, commercial feedlots).
- Enter the total acres rented in by this operation.

**Item 1c: Acres Rented To Others**

**Include:**

- (1) land that this operation owned (or rented from someone else) which was rented (or subleased) to another operation during the 2011 crop year. This land should also be included in either Item 1a or 1b.
  - (2) land rented to others for cash.
  - (3) land rented to others for a share of crop or livestock production.
  - (4) land that this operation allowed another operation to use free of charge.
  - (5) pasture or grazing land rented out on a per acre basis.
  - (6) land owned but managed for a fee or salary by someone else.
-

**Exclude:**

- (1) land which this operation has enrolled in government programs (acreage in Conservation Reserve Program (CRP), Wetlands Reserve Program (WRP), and other diverted land.)
  - (2) land worked by sharecroppers on this operating unit.
  - (3) land used by a son or daughter for 4-H or FFA projects if the parent's equipment was used.
  - (4) land on which crops were grown under contract, if the land owner furnished machinery **or** controlled the seeding, growing and harvest of the crop.
  - (5) land used for pasturing someone else's livestock when payment was made on a per head or AUM basis.
  - (6) land on which the operator fed livestock under contract for someone else.
- Enter the total acres rented to others by this operation.

**Item 2: Total Acres on the Operation**

The operation's total farming or ranching operation acreage is the total of Items [1a + 1b - 1c].

- Enter the total acres operated by this operation.

**Item 2a: Verify Total Acres on the Operation**

After calculating the total acres operated during the 2011 crop year, verify with the respondent that this is the correct total for the operation.

**Item 3: Total Cropland Acres on the Operation**

Of the (Item 2) “total acres operated”, enter the number of acres considered to be cropland in cell 1905. Cropland is any land currently in crop production or land that has previously been tilled and used for crops

and could be tilled again without additional improvements. Report to the nearest tenth (1/10).

**Include:**

- (1) land in crop-pasture rotation and cropland used for pasture or grazing during the current year.
- (2) land in summer fallow.
- (3) idle cropland (no crops planted or harvested in current year).
- (4) crop land diverted for government programs (including CRP), unless the land is planted to trees.
- (5) fruit orchards, vineyards, nut trees, and citrus groves.
- (6) vegetables, melon crops, and other specialty foods.
- (7) nursery crops, turf grass, sod, and Christmas Trees.
- (8) land in hay crops, **excluding** wild hay.
- (9) pasture land tilled in the past if the land could be tilled again without first clearing brush, trees, undergrowth, etc.

**Exclude:**

- (1) pasture and rangeland that has never been tilled.
  - (2) wild hay land. Although wild hay is considered a crop, wild grasses cut for hay should not be included in acres of cropland.
  - (3) government program acres planted to trees. These acres are woodland.
  - (4) woodland and wasteland.
- Enter the total acres of cropland operated by this operation.

## Section K - Operator and Operation Characteristics

### What is Section K for? How is the information used?

The questions in this section are used to categorize farms according to type and experience of the operator.

Data in this section refers to the **entire farming operation**, not just to the selected field as in previous sections.

### Item 1: Legal Status of Operation

This question identifies the type of operation or proprietorship that best describes how this operation was operated in 2011. Definitions of each legal status are as follows:

- 1. FAMILY or INDIVIDUAL operation (exclude partnership and corporation)** - Enter a "1" if this operation is operated by an individual, or an individual and family, or by a husband and wife. This should include farms or ranches which are family operations but are not incorporated or operated as partnerships.
- 2. PARTNERSHIP operation (include family partnerships)** - Enter a "2" if this operation was run by two or more persons in partnership. This should **not** include farms or ranches run by husbands and wives (unless there is a formal agreement other than a marriage license or vows). It is intended to include organizations where two or more persons have agreed to share contributions (capital and effort), decision making, liabilities, and the distribution of profits.
- 3. FAMILY-HELD CORPORATION INCORPORATED UNDER STATE LAW** - Enter a "3" if incorporated under State law. A corporation may be defined as a legal entity or artificial person created under the law of a state to carry on a business. A family corporation has more than 50 percent of its stock owned by persons related by blood or marriage.
- 4. NON-FAMILY CORPORATION INCORPORATED UNDER STATE LAW** - Enter a "4" if incorporated under State law and the corporation has more than 50 percent of its stock owned by persons not related by blood or marriage.

**5. OTHER** - Enter a "5" if this operation is an estate, trust, American Indian Reservation, Cooperative Institution or Experiment Station, etc. Specify type in the response area.

Some examples are:

- **Estate** - Undivided property still in or subject to probate.
- **Trust** - The farm is operated by a person as trustee for someone else who is not of age, or may be in a hospital, institution, or is otherwise unable to carry on his/her own business. Estate or trust may be further defined as a property administered for the benefit of another individual or organization. Estate or trust may also be defined as a fund of money or property administered for the benefit of another individual or organization.
- **American Indian Reservation** - The farm or ranch is owned by and/or part of an American Indian Reservation and operated for the general benefit of reservation residents. Farms or places operated by American Indians owning or having allotted land should be reported in the same manner as any other farm, ranch, or place.
- **Cooperative** - If this operation is operated as a cooperative, it is defined as an incorporated or unincorporated enterprise or association created and formed jointly by the members.
- **Institution** - If this operation is operated as an institution it would be part of a school, prison, hospital, religious organization, etc.
- **Experiment Station** - If this operation is an experiment station it is operated primarily for research by either a public or private agency, and perhaps, but not necessarily, in conjunction with a university or school.

## Item 2: Operator's Major Occupation

We consider major occupation to be the occupation or work at which an individual spent more than 50% of his/her work time in 2011. Some farmers may call themselves retired because they are farming on a smaller scale than when they were younger. Other people who have retired from an off-farm job and now farm on a small scale may also call themselves retired.

- If the operator spent the majority (50 percent or more) of his/her work time in farming or ranching operations in 2011, code box 1913 = 1. Otherwise, record what the respondent considers themselves to be in terms of major occupation. (Hired farm manager = 2, Something else = 3, or Retired = 4.)

### **Item 3: Education Level of Operator**

- Indicate the code representing the highest level of school completed by the **operator(s)**. Vocational school, secretarial school, etc. should not be counted as formal education unless the credits can be transferred to a college or university. An associate degree should be recorded as some college.

### **Item 4: Year the Operator Began Making Day-to-Day Decisions for any Farm/Ranch**

- Record the first year the operator(s) began to operate (make decisions for) any farm/ranch on a continuous basis. Record the date as four digits (1953, 1985, etc.).

### **Item 5: Total Gross Value of Sales Classification**

- Check the box next to the category that best describes the gross value of sales in 2010 for the entire operation.

**Include:**

- (1) sales of products raised on the total acres operated.
- (2) the value of any commodities given to the landlord for rented land.
- (3) all production from 2009 and earlier years sold during 2010.
- (4) all sales of livestock and poultry during 2010.
- (5) sales of all types of horses.

- (6) sales of miscellaneous agricultural products such as honey, furs, fish, nursery and greenhouse products, rabbits, Christmas trees, etc.
- (7) all government program payments received in 2010.
- (8) total equity or premium payments or CCC loans transferred to others or repaid by others in 2010.
- (9) value of products removed from the operation under production contracts.
- (10) the estimated value of products removed from contractee operations.

**Exclude:**

- (1) prizes or winnings from horse racing or showing.
- (2) any money received through the sale of commodities received as share-rent payment for land rented out.
- (3) other farm-related income such as grazing income, timber sales, and insurance payments.

**Item 6: Farm Type**

For this question, make sure the respondent refers to the list of Farm Type Codes in the Respondent Booklet. Ask the respondent to select the category which represents the largest portion of this operation's 2010 gross income.

Government payments should be distributed among the categories according to the type of program in which the operator participated.

When the respondent reports that sales for two of the categories are equal, ask which group is more important and is the primary production activity.

Operations primarily engaged in producing short-term woody crops should be counted as farms and classified in "Cut Christmas Trees and Short Rotation Woody Crops" category. Short-term woody crops are softwood trees (hybrid poplar, cottonwoods and pines) reaching maturity in 10 years or less and typically are used for paper production.

A farm primarily engaged in raising dairy heifers for herd replacements is classified as a “Cattle and Calves” operation because no milk or dairy products are being produced.

- Record the farm type code in Item 6.

## Back Cover - Conclusion

### Items 1a, 1b, 1c: Records Use

*Do not ask these remaining questions of the Respondent. They are only for administrative purposes and analysis. You should fill them out after the interview is completed.*

Analysts and other data users are interested in comparing reported data with the use of records. The use of records should indicate data are of a higher quality. Enter a code "1" to indicate the respondent referred to and used written records when reporting the indicated items.

#### Item 1a: Fertilizer Data

- If farm records were used for completing the majority of the **fertilizer** data items in the questionnaire, enter code "1" = "YES" in cell 0026.

#### Item 1b: Pesticide Data

- If farm records were used for completing the majority of the **pesticide** data items in the questionnaire, enter code "1" in cell 0027.

#### Item 1c: Manure Data

- Indicate whether farm/ranch records were used for the completing most of the **manure** items in the questionnaire. Enter "1" in cell 0028 for "YES".

### Item 2: Conservation Plan Used

- Indicate whether a formal written conservation plan was used for completing most of the questions from Section B in the questionnaire. Enter "1" in cell 0029 for "YES".

### Item 3: Supplements Used

- Record the total number of each type of supplement used in completing this interview in the designated cell. These items are important to provide a means to check for misplaced or lost supplemental sheets during the computer edit. Be sure all of the supplements are inside the questionnaire before mailing the questionnaire or turning it over to a supervisor.

## Administrative Items

### Ending Time

Record the ending time of the interview in cell 0005. Exclude the time you spend reviewing the questionnaire or verifying calculations by yourself after you have completed the interview. Be sure the ending time is after the beginning time entered on the face page. Use military time, i.e., 4:00 p.m. should be recorded as 1600.

If the interview occurred over multiple days then beginning time (Item code 0004) and ending time (Item code 0005) should be blank. Total hours (Item code 0006) should be completed.

If more than one person was interviewed or it took more than one appointment to complete the interview, use the Time in Hours instead. the total time should reflect the approximate total time for the questionnaire.

### Time in Hours

The Time in Hours box is a cell that should be used when an interview extends to cover more than one day. That is, the respondent may be interviewed from 1600 to 1800 hours on November 2 (2.0 hours), and from 0800 to 1200 hours on November 3 (4.0 hours) to collect all the information for the survey. It will be crucial that the enumerator write down these dates and times so the time in hours it took to complete the entire interview can be reported. In the case above, 6.0 hours would be recorded in cell 0006.

### Response Code

Upon completion of the interview, enter the response code in cell 9901 on the back page of the questionnaire. Response codes are:

Code 1- **Complete**: Complete means you have obtained all of the data needed for the questionnaire. Also use Code 1 for operations that you have determined to be out of scope. If out of scope, write an explanation explaining the situation on the back of the questionnaire.

Code 2 - **Refusal**: The respondent refused to cooperate or grant an interview.

**Code 3 - Inaccessible / Incomplete:** The operator was not available throughout the survey period (inaccessible). You will also use code 3 if the respondent gave an interview but could not or would not answer a lot of the questions (incomplete questionnaire). If you determine that the target operation does not produce the selected commodity, code the questionnaire complete (code 1) and indicate the source of your information with a note. In all cases, write a note explaining the situation.

### **Respondent Code**

The respondent code identifies the person who was interviewed. Enter the code identifying the person who provided most of the data in cell 9902.

- Code 1 = Operator or Manager
- Code 2 = Operator's Spouse
- Code 3 = Accountant or Bookkeeper
- Code 4 = Partner

Record the respondent's name and phone number.

### **Mode Code**

All NRI CEAP questionnaires should be conducted by personal interview. Enter code 3 in cell 9903.

**Code 3 = Face-to-Face.**

### **Enumerator Name**

Sign the questionnaire and record your enumerator ID number in cell 0098.

### **Date**

Record the date the questionnaire was completed. Enter the date the interview was completed in MMDDYY format on the lines provided in cell 9910.

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**Review the entire questionnaire before forwarding it to your Supervisor. Make sure all Items are complete, including “YES” and “NO” boxes checked, and dashes are entered in cells when the response is “None” or “No” as appropriate. Make sure notes are present and complete for unusual situations.**

**Verify that the proper identification numbers have been recorded on all supplemental forms. Verify the number of supplements reported for Item 3.**

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