# **Text  Description automatically generatedRetrospective Soil Health Economic Calculator (R-SHEC) Questionnaire**

# **For “Soil Health Successful” Row Crop Farmers**

(*Those who have been using soil health practices for at least 4 years & no more than 15 years*

*with economic success stories to share*)

# **Row Crop Version:** Barley, Corn Grain, Corn Silage, Grain Sorghum, Hay, Oats, Soybeans, Wheat

**Updated: September 28, 2022**

# Information Provided in the “Pre-Interview Form”

*Thank you for completing the Pre-Interview Form in advance of this full R-SHEC Questionnaire. Your responses have been inserted below. At this point, you should have read and discussed the Soil Health Economic and Environmental Case Study “Introduction” document with your interviewer and signed the Consent Form. Please do so if you have not. Please complete the questionnaire below with your interviewer.*

**Name of farm:****Name of farmer:**

**Total farm acres: Acres owned: Acres rented:**

**Farm address**:

**Mailing address (if different from above):**

**County:** **Watershed:**

**Phone number:** **Email**:

**Date**:**Name of****Interviewer:**

**DETERMINE THE STUDY AREA:**

1. **Do you have a portion of your farm where (a) you have been implementing Reduced Tillage, Cover Cropping, and/or Nutrient Management, OR Conservation Crop Rotation (can only be analyzed as a sole practice) for at least four years and for no longer than 15 years ago**, **and (b) you have observed economic and soil health benefits from these practices?**
	1. If no, go no further in this questionnaire before discussing options with your interviewer.
	2. If yes, please answer the following questions.
2. **Is your farm sub-divided into enterprises (e.g., vegetables, pastureland)?** If so, please describe each enterprise and the associated acreage. Please make sure all acres add up to the total farm acres provided above.
3. **Is your farm organic? (Y/N)** \_\_\_\_\_\_\_\_
4. **Please tell us about all row crop rotations on your farm and associated soil health practices by crop year** (crop year generally begins in the fall – the first day after previous crop harvest – and ends the last day of crop harvest). *(See example in gray rows for guidance. Clear out example rows to make room as needed.)*

Table : Farm Rotations and Timeline of Soil Health Practice Use

|  |  |
| --- | --- |
| **Crop Rotations** | **Current Soil Health (SH) Practices?**  |
| **Rotation Name** | **Crop and Years in Rotation** | **Total Acreage**  | **SH Practices and Current Acreage?** | **Year Initiated each SH Practice** |
| *E.g., Corn-Soybean-Hay* | *Corn-1, Soy-1, Hay-3* | *1100* | * *No-till Soy 500*
* *NM 1100*
* *Cover Crop Corn & Soy 1000*
 | * *2010*
* *2015*
* *2014*
 |
| *E.g., Corn-Soybean* | *Corn-1, Soy-1* | 500 | * *No-till Soy 500*
 | * *2010*
 |
|  |  |  |  |  |
|  |  |  |  |  |

1. **Of the rotations, name the rotation and acreage where you have used the greatest number of soil health practices for the longest amount of time?** *Note, if you have changed your crop rotation for soil health, the R-SHEC Tool is unable to analyze this practice alongside other soil health practices.*

**Rotation Name and Acreage** (*E.g., Corn-Soy-Hay)*: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. **This will be your Study Area.**

1. **Study Area Location** (i.e., central GPS Coordinate or address, and qualitative description of location; provide a map if possible):
2. **Study Area Benchmark and Current Crop Rotations:** List each crop grown in your Study Area and the number of years in the rotation. Only enter a crop once and adjust the number of years and acres appropriately. The rotation should differ between benchmark and current ONLY if you are analyzing a Conservation Crop Rotation soil health practice, otherwise enter identical information for the Benchmark and Current Rotations.

***Note:*** *In order to annualize the costs and benefits analyzed in this Tool, user must calculate acres of each crop in the rotation by dividing the total acres by the number of years in rotation, then multiply by the number of years in rotation. (E.g., if the Study Area is 400 acres with a 4-year crop rotation (2-corn, 1-wheat, 1-soybeans), then user enters 200 acres for corn [(400/4) \* 2], 100 acres in wheat, and 100 acres in soybeans [(400/4)\*1].)*

Table : Study Area Crop Rotation

|  |
| --- |
| **Benchmark Rotation** |
| **Crop** | **# Years** | **Acres** |
|   |  |  |
|   |  |  |
|   |  |  |
|   |  |  |
| **Current Rotation** |
| **Crop** | **# Years** | **Acres** |
|   |  |  |
|   |  |  |
|   |  |  |
|   |  |  |

1. **Economic Benefits –** Please briefly describe any economic benefits you have experienced from adopting soil health practices:
	1. **How did you conclude that the above benefits are attributable to soil health practices?**
	2. **What other factors may have influenced economic benefits other than the adopted soil health practices?**
2. **Environmental Benefits –** Please briefly describe any environmental and soil health benefits you have observed from adopting soil health practices:
3. **Please describe what motivated your adoption of soil health practices and when?**
4. **What challenges have you experienced during the adoption of soil health practices?**
5. **What else do you like about the soil health practices you have adopted that you have not mentioned above?**
6. **Please complete the following table for the Study Area benchmark and current management activities by crop.** Indicate your **benchmark** (pre-soil health practice adoption) and **current** (post-adoption) management activities **by crop (split between columns)** **for that crop year** (crop year generally begins in the fall – the first day after previous crop harvest – and ends the last day of crop harvest). Include as much detail as possible.

Table : Study Area Benchmark and Current Management

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Soil Health Practices** |  | **Crop 1: \_\_\_\_\_\_\_\_\_\_\_\_\_\_** | **Crop 2: \_\_\_\_\_\_\_\_\_\_\_\_\_\_** | **Crop 3: \_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
| **Tillage** | **Benchmark** |  |  |  |
| **Current** |  |  |  |
|  |
| **Cover Crops** | **Benchmark** |  |  |  |
| **Current** |  |  |  |
|  |
| **Nutrient Management** | **Benchmark** |  |  |  |
| **Current** |  |  |  |
| *Note: A change in crop rotation cannot be analyzed with other soil health practices due to data discrepancies.* |
| **Conservation Crop Rotation** | **Benchmark** |  |
| **Current** |  |

**Add any notes below on benchmark versus current management activities:**

**THE FOLLOWING QUESTIONS CAN BE ANSWERED IN FULL INTERVIEW:**

1. **How many years have you been involved with agriculture?**
2. **How many people are involved in your farm operation? What is your role?**
3. **Please describe your farm’s topography** (e.g., rolling hills, flat, flood plain, etc.):
4. **Who do you generally talk to about soil health practices? Where do you get information** (e.g., NRCS, SWCDs, Extension, ag retailer, crop consultant, farm magazine articles, state, or regional SH practice farmer group)?
5. **Learning activities:** The R-SHEC Tool calculates a per acre cost for learning activities associated with adopting soil health practices. This value is based on an hourly rate of $26.18 (U.S. Bureau of Labor Statistics, 2022; see R-SHEC Tool “Prices” tab) combined with the number of hours per year spent on learning activities. **For each practice you are using, please estimate hours per year spent enhancing your knowledge about adopted soil health practices and what types of learning experiences you engage in (e.g., workshops, field days, meetings, reading articles, internet research).** Use Combined Practices Learning Activities only when you cannot separate hours spent by practice. Do not enter hours for individual practices if using the Combined Practices Learning Activities. If you would prefer to use your own labor rate, please report below as well.
	1. No-Till or Reduced Tillage Learning Activities (hours/yr): \_\_\_\_\_\_\_\_
	2. Cover Crops Learning Activities (hours/yr): \_\_\_\_\_\_\_\_\_\_
	3. Nutrient Management Learning Activities (hours/yr): \_\_\_\_\_\_\_\_\_
	4. Conservation Crop Rotation Learning Activities (hours/yr): \_\_\_\_\_\_\_\_\_\_
	5. Combined Practices Learning Activities (hours/yr): \_\_\_\_\_\_\_\_\_\_
	6. **OPTIONAL:** Farmer’s Reported Labor Hourly Rate ($/hour): \_\_\_\_\_\_\_\_
6. **2021 Fertilizer and Crop Prices:** To estimate the economic effects of adopting soil health practices, the R-SHEC Tool uses national average prices for fertilizer and crops grown. If you would like to use your own prices, enter them below. If any are left blank, we will use national average values for your retrospective analysis.
(See R-SHEC Tool “Prices” tab for sources.)
	1. Nitrogen ($/lb): \_\_\_\_\_\_\_\_\_\_ (National Ave. = $0.72/lb)
	2. Phosphorus ($/lb): \_\_\_\_\_\_\_\_\_\_ (National Ave. = $0.62/lb)
	3. Potassium ($/lb): \_\_\_\_\_\_\_\_\_\_ (National Ave. = $0.56/lb)
	4. Other fertilizer prices ($/lb) – include type and description:
	5. Barley ($/bu): \_\_\_\_\_\_\_\_\_\_ (National Ave. = $5.15/bu, $9.87/bu organic)
	6. Corn Grain ($/bu): \_\_\_\_\_\_\_\_\_\_ (National Ave. = $5.45/bu, $10.42/bu organic)
	7. Corn Silage ($/ton): \_\_\_\_\_\_\_\_\_\_ (National Ave. = $49.05/bu, $78.79/bu organic)
	8. Grain sorghum ($/cwt): \_\_\_\_\_\_\_\_\_\_ (National Ave. = $9.75/bu, $8.75/bu organic)
	9. Hay ($/ton): \_\_\_\_\_\_\_\_\_\_ (National Ave. = $186/ton, $191.78/ton organic)
	10. Oats ($/bu): \_\_\_\_\_\_\_\_\_\_ (National Ave. = $4/ton, $6.40/ton organic)
	11. Soybeans ($/bu): \_\_\_\_\_\_\_\_\_\_ (National Ave. = $13/bu, $24.39/bu organic)
	12. Wheat ($/bu): \_\_\_\_\_\_\_\_\_\_ (National Ave. = $7.30/bu, $10.63/bu organic)

**OPTIONAL: DETERMINE FOCUS FIELD WITHIN STUDY AREA FOR ENVIRONMENTAL ANALYSIS:**

**Identify a Focus Field for a retrospective environmental analysis.** Your interviewer will conduct a water quality analysis using USDA’s Nutrient Tracking Tool (NTT) and a greenhouse gas emissions analysis using USDA’s COMET Tools to estimate the environmental benefits associated with your use of soil health practices. Questions about growing history needed by the NTT/COMET Tools will be restricted to what we call a Focus Field.

**Use the following criteria to select your Focus Field:**

1. Located within your Study Area and consistent with current production and management system of the Study Area described above in Table 3.
2. Has had the soil health practice(s) implemented for the longest time.
3. Has a long record of historic crop production & management information.
4. If your Focus Field contains a structural practice (Tile Drain, Filter Strip, Riparian Buffer, Grassed Waterway, Water and Sediment Control Basin, etc.), it must have been installed BEFORE you began implementing soil health practices on the field. That way, the NTT tool will not estimate the change in benefits of the structural practice, rather the tool will estimate the change in benefits due to the soil health practice(s).
5. **Is your Focus Field different than your Study Area?** If yes, proceed to answer the following questions. If no, skip to Question 23.
6. **Focus Field Location:**
	* 1. Qualitative description (optional):
		2. GPS Coordinates:
		3. Identify Focus Field Location on an online map with your interviewer or provide a map (optional).
7. **Name and acreage of your Focus Field:**
8. **Focus Field Crop Rotation:**
9. **Please list in table below the soil health practices on your Focus Field and the year you started using them:**

Table : Focus Field Adopted Soil Health Practice(s)

|  |  |  |  |
| --- | --- | --- | --- |
| **Crop** | **Focus Field Soil Health Practice(s)** | **First Year** | **Additional Notes (e.g., crop, acreage, etc.)** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

1. **Choosing between COMET-Farm versus COMET-Planner Tool –** To estimate the greenhouse gas reduction benefits associated with the use of soil health practices, you can choose to use either COMET-Farm or COMET-Planner Tool. Discuss the pros and cons of each Tool with your interviewer. **COMET-Farm** provides a **site-specific analysis** reflecting soils and weather data associated with your Focus Field. It also requires a longer, data-intensive interview to obtain historic crop production information for up to 20 years. If detailed crop history is not available, you and your interviewer can make assumptions about what was grown in the Focus Field and when. **COMET-Planner** provides a **coarse county-level analysis**. It requires very little time and involves very few questions though results will be general in nature.

**Do you prefer one or the other tool?**

COMET-Farm: \_\_\_\_\_\_\_\_\_ COMET-Planner: \_\_\_\_\_\_\_\_\_ Not Sure: \_\_\_\_\_\_\_\_\_ No preference: \_\_\_\_\_\_\_\_\_\_

# Soil Health Practices and Economic Impacts

This part of the interview covers the economic changes – both costs and benefits – that you have experienced with the adoption of soil health practices on your farm. We want you to provide responses for the Study Area selected in Section I. Information collected here will be input into the Excel-based R-SHEC Tool to conduct a partial budget analysis. An economic partial budget analysis is a cost-benefit analysis that isolates the costs and benefits associated with the evaluated soil health practice(s). Any changes that are not related to the soil health practices are not evaluated.

**Section II is divided between the soil health practices and combined practice effects. Complete only sections that pertain to current soil health practices on your Study Area as identified in Table 3 above. For each practice, please tell us how the operation worked pre-adoption (benchmark setting) and post-adoption (current setting).** You will notice that each practice section asks similar or the same questions about changes in machinery operations, yield, nutrient use, pesticide use, and erosion. It is alright to leave questions blank if you are unsure.

**If you find it difficult to attribute field operation changes to individual soil health practices, you should use the “Combined Practice Effects” section** to provide estimates for these changes attributable to the use of practices in combination.

**Important Note:** Adoption of a Conservation Crop Rotation (CCR), a change in crop rotation for soil health practices, cannot be analyzed with other soil health practices due to data discrepancies. Users can only analyze a CCR as a sole soil health practice. Additionally, corn silage cannot be analyzed as part of a CCR because there is no net income data for corn silage.

**NO-TILL/REDUCED TILLAGE**

**TIP:** *If a particular effect cannot be attributed solely to a change in tillage, the user can enter it on the Combined Practice Effects section.*

1. If your tillage activities changed, complete the following tables by crop by listing the **machinery/implements associated with field preparation and planting used before (benchmark)** and **after (current)** **adopting new tillage activities in the Study Area**. (*Note, review the list of machinery and associated costs included in the R-SHEC Tool to determine the machinery that most closely matches your equipment. A PDF list is available.*)
	* 1. **CROP 1:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Current Tillage Type:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **Current Acres:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

First Year Adopted: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ First Year Acreage: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Table a: Crop 1 Benchmark Machinery – Before Adopting No-Till or Reduced Tillage

|  |  |  |
| --- | --- | --- |
| **Crop 1 Benchmark** **Tillage Machinery** | **Size** | **Passes/Year** |
| *\*E.g., Chisel Plow* | *23-feet* | *2* |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

*\*Note: Be sure to write down all the applicable passes (e.g., chisel plow, disking, field cultivator, planting, etc.) as only one example is provided.*

**Table 5b: Crop 1 Current Machinery – After Adopting No-Till or Reduced Tillage**

|  |  |  |
| --- | --- | --- |
| **Crop 1 Current Tillage Machinery** | **Size** | **Passes/Year** |
| *\*E.g., No-Till Corn Planter* | *40-feet; 16-row* | *1* |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

* **Record any descriptions about Crop 1 savings experienced by switching to No-Till/Reduced Tillage:**
	+ 1. **CROP 2:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Current Tillage Type:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **Current Acres:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

First Year Adopted: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ First Year Acreage: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Table 5c: Crop 2 Benchmark Machinery – Before Adopting No-Till or Reduced Tillage**

|  |  |  |
| --- | --- | --- |
| **Crop 2 Benchmark Tillage Machinery** | **Size** | **Passes/Year** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Table 5d: Crop 2 Current Implements – After Adopting No-Till or Reduced Tillage**

|  |  |  |
| --- | --- | --- |
| **Crop 2 Current Tillage Machinery** | **Size** | **Passes/Year** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

* **Record any descriptions about Crop 2 savings experienced by switching to No-Till/Reduced Tillage:**

**\*IF THERE ARE MORE CROPS BEING ASSESSED, COPY, PASTE, & COMPLETE QUESTION (a) and TABLES (a) and (b) HERE.**

1. Complete table below if you observed a **yield decrease or increase** in any cash crops due to adopting No-Till or Reduced Tillage in the Study Area. We suggest only entering changes in average yield below if Tillage is the only soil health practice analyzed, otherwise enter yield impacts in the Combined Practice Effects section. Remember, we are only looking for the change in yield due to reducing tillage, not because of other changes to production like increased plant population or changing seed varieties. *(The example illustrates that the average benchmark corn yield (150 bu/ac) increased by 10% due to reducing tillage.)*

Table : Observed Change in Average Yield by Crop due to Adopting No-Till or Reduced Tillage

|  |  |  |
| --- | --- | --- |
| **Cash Crop** | **Benchmark Average Yield before Reducing Tillage (bu/acre or tons/acre)** | **Change in Average Yield due to Reducing Tillage****(+/- % change, bu/acre, or tons/acre)** |
| *E.g., Corn* | *E.g., 150 bu/ac* | *E.g., +15 bu/ac* |
|  |  |  |
|  |  |  |
|  |  |  |

1. **Is this estimated or reported yield?** \_\_\_\_\_\_ Estimated \_\_\_\_\_\_Yield Monitor
2. **Add any comments about weather impacts (drought year or wet spring) on yield:**
3. Identify in table below any **reductions or increases in primary nutrient inputs (N, P, K) by crop** due to adopting No-Till or Reduced Tillage. *(The example illustrates a reduction of 30 pounds per acre of Nitrogen for the corn crop due to reducing tillage.)*

Table : Reductions or Increases in Primary Nutrient Inputs (N, P, K) due to Reducing Tillage

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Cash Crop** | **N Reduction or Increase (lb/ac)** | **P Reduction or Increase (lb/ac)** | **K Reduction or Increase (lb/ac)** | **Additional Notes** |
| *E.g., Corn* | *-30 lb/ac* | *0* | *0* |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

1. Identify in table below any **reduction or increase in pesticides by crop** due to adopting No-Till or Reduced Tillage by providing the benchmark cost/acre (include chemical and application costs) for each pesticide category *before* you started No-Till or Reduced Tillage and an estimated percent reduction or increase *due to* reducing tillage. (*The example illustrates a 15% increase from their benchmark $20 per acre herbicide cost for the soybean crop for additional weed control due to reducing tillage.)*

Table : Reductions or Increases in Pesticide Costs due to Reducing Tillage

|  |  |  |  |
| --- | --- | --- | --- |
| **Cash Crop** | **Herbicides** | **Insecticides** | **Fungicides** |
| **Benchmark Cost ($/ac)** | **% Change** **(+/-)** | **Benchmark Cost ($/ac)** | **% Change** **(+/-)** | **Benchmark Cost ($/ac)** | **% Change** **(+/-)** |
| *E.g., Soybean* | *E.g., $20/ac* | *E.g., +15%* | *0* | *0* | *0* | *0* |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

1. If you observed a **reduction in soil erosion** due to adopting No-Till or Reduced Tillage, please answer the following questions:
	1. **Please describe any changes you may have visually observed in erosion on your farm due to reducing tillage:**
	2. **Please estimate the Number of Acres that saw a reduction in the rate of sheet and rill erosion:** \_\_\_\_\_\_ ***Note:*** *This could be the entire area where you have switched to No-Till or Reduced Tillage in cases where slopes are relatively uniform throughout or, if the area is comprised of a combination of relatively flat areas and steeper ground, the acreage could be the portion encompassed by the steeper ground.*
	3. Please provide your **observed/estimated reduction in sheet and rill erosion:** \_\_\_\_\_\_ **Tons/Acre/Year**

***Note:*** *Enter tons of reduced erosion results modeled using any sediment reduction tool, such as the Nutrient Tracking Tool; enter the erosion reduction value from RUSLE-2 analysis if undertaken by your advisor; or any value that seems reasonable based on soil including zero.*

* 1. **Is mechanical erosion repair a typical part of your Study Area operation?** (Y/N) \_\_\_\_\_\_\_\_
		1. If yes, has reducing tillage reduced the need for erosion repairs? (Y/N) \_\_\_\_\_\_\_\_
		2. If yes, please provide:
			1. An estimate of the **total annual DECREASE in mechanical erosion repair cost** due to reducing tillage within your Study Area: - \_\_\_\_\_\_\_\_ **$/year**
			2. A **description** of the mechanical erosion repair activities within your Study Area that used to be carried out on an annual basis, and how/why the activities changed:
1. If you previously received or are currently receiving **financial assistance** for implementing No-Till or Reduced Tillage, please complete table below:

***Note:*** *Any financial assistance payments listed are not included in the partial budget analysis because cost-share is temporary and not received by all but can be noted in the footnote of PBA table.*

Table : Financial Assistance History for Adopting No-Till or Reduced Tillage

|  |  |  |  |
| --- | --- | --- | --- |
| **Start Year and Ending Year** | **Source of Funding** | **$/acre** | **Acres Enrolled** |
| *E.g., 2017 - 2020* | *NRCS - EQIP* | *$10* | *500* |
|  |  |  |  |
|  |  |  |  |

1. Describe below any **other benefits, costs, or changes in activities** that were not needed or added due to adopting No-Till or Reduced Tillage *(e.g., no longer need to pick rocks out of the field):*

Table : Other Benefits, Costs, or Changes in Activities due to Adopting No-Till or Reduced Tillage

|  |  |  |
| --- | --- | --- |
| **Description of Other Benefit(s)** | **$/acre** | **Number of Acres Affected** |
|  |  |  |
|  |  |  |
| **Description of Other Cost(s)** | **$/acre** | **Number of Acres Affected** |
|  |  |  |
|  |  |  |

**NUTRIENT MANAGEMENT**

**TIP:** *If a particular effect cannot be attributed solely to a change in nutrient management activities for soil health, the user can enter it on the Combined Practice Effects section.*

1. If you have a **NRCS Practice Code 590 Nutrient Management Plan or a Nitrogen Plan for your Study Area**, enter the year it was prepared next to the person or organization who prepared your Plan in table below:

Table : Study Area Nutrient Management Plan History

|  |  |  |
| --- | --- | --- |
| **Preparer** | **NRCS 590 or Nitrogen Nutrient Management Plan Year Prepared** | **Notes** |
| Natural Resources Conservation Service |  |  |
| Advisor via NRCS Cost-Share Program |  |  |
| State Nutrient Management Planner |  |  |
| Cooperative Extension Service |  |  |
| Soil and Water Conservation District |  |  |
| Ag Retailer |  |  |
| Certified Crop Advisor |  |  |
| Professional Agronomist |  |  |
| Self-Certification |  |  |
| Other: |  |  |

1. Please describe your **benchmark and current** **fertilization activities** **by crop** in your Study Area:
2. Describe **benchmark** Nutrient Management activities by crop (e*.g., fall application, soil testing)*:
3. Describe **current** Nutrient Management activities by crop (e*.g., split application, Variable Rate Technology):*
4. The tool will calculate effects (i.e., changes in yield, fertilizer use, and pesticide use) brought about by changes in your Nutrient Management activities by crop. For each crop, **indicate the number of acres within your Study Area affected by changes in your Nutrient Management activities:**
	* Corn: \_\_\_\_\_\_\_\_\_\_\_\_\_ acres
	* Hay: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ acres
	* Soybeans: \_\_\_\_\_\_\_\_\_ acres
	* Wheat: \_\_\_\_\_\_\_\_\_\_\_ acres
5. If your fertilizer application machinery changed due to a change in your Nutrient Management activities, complete the following tables **by crop** by listing **fertilizer machinery/implements used before (benchmark) and after (current) adopting new Nutrient Management activities.** (*Note, review the list of machinery and associated costs included in the R-SHEC Tool to determine the machinery that most closely matches your equipment. A PDF list is available.* *Be sure to include implements used to spread manure or compost if appropriate.* *For manure spreading, instead of passes/year, enter gallons/acre for liquid manure and hours/acre for solid manure applied with a spreader.* *See example in the first gray row for guidance.)*

**CROP 1: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Current Acres: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

First Year Adopted: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ First Year Acreage: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Table a: Crop 1 Benchmark Machinery – Before Change in Nutrient Management Activities

|  |  |  |
| --- | --- | --- |
| **Crop 1 Benchmark NM Machinery** | **Size** | **Passes, Gallons, or Hours per Acre** |
| *E.g., Anhydrous ammonia applicator* | *40-foot* | *1 pass/yr* |
| *E.g., P&K Spreading (dry bulk applied)* | *40-foot* | *1 pass/yr* |
|  |  |  |
|  |  |  |
|  |  |  |

**Table 12b: Crop 1 Current Machinery – After Change in Nutrient Management Activities**

|  |  |  |
| --- | --- | --- |
| **Crop 1 Current NM Machinery** | **Size** | **Passes, Gallons, or Hours per Acre** |
| *E.g., Liquid side dressing* | *40-foot* | *1 pass/yr* |
| *E.g., Y drop application, 80-foot* | *40-foot* | *1 pass/yr* |
|  |  |  |
|  |  |  |
|  |  |  |

* **Record any descriptions about CROP 1 change in Nutrient Management activities:**

**CROP 2: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Current Acres: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

First Year Adopted: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ First Year Acreage: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Table 12c: Crop 2 Benchmark Machinery – Before Change in Nutrient Management Plan**

|  |  |  |
| --- | --- | --- |
| **Crop 2 Benchmark NM Machinery** | **Size** | **Passes, Gallons, or Hours per Acre** |
|  |  |  |
|  |  |  |
|  |  |  |

**Table 12d: Crop 2 Current Machinery – After Change in Nutrient Management Plan**

|  |  |  |
| --- | --- | --- |
| **Crop 2 Current NM Machinery** | **Size** | **Passes, Gallons, or Hours per Acre** |
|  |  |  |
|  |  |  |
|  |  |  |

* **Record any descriptions about CROP 2 change in Nutrient Management activities:**

**\*IF THERE ARE MORE CROPS BEING ASSESSED, COPY, PASTE, & COMPLETE QUESTION (a) and TABLES (a) and (b) HERE.**

1. Complete table below if you observed a **yield** **decrease or increase** in any cash crops due to a change in Nutrient Management activities in the Study Area. We suggest only entering changes in average yield below if nutrient management is the only soil health practice analyzed, otherwise enter yield impacts in the Combined Practice Effects tab. (*The example illustrates that the average benchmark corn yield (150 bu/ac) increased by 20% due to change in Nutrient Management activities.*)

Table : Observed Change in Average Yield by Crop due to Change in Nutrient Management Activities

|  |  |  |
| --- | --- | --- |
| **Cash crop** | **Benchmark Average Yield Before Adopting NM (bu/ac or tons/ac)** | **Change in Average Yield Due to Adopting NM****(% change, +/- bu/ac, or tons/ac)** |
| *E.g., Corn* | *150 bu/ac* | *+20% increase, 180 bu/ac* |
|  |  |  |
|  |  |  |
|  |  |  |

**Is this estimated or reported yield?** \_\_\_\_\_\_ Estimated \_\_\_\_\_\_Yield Monitor

**Add any comments about weather impacts (drought year or wet spring) on yield:**

1. Identify in table below any **reductions or increases** **in primary nutrient inputs (N, P, K) by crop** due to a change in Nutrient Management activities. (*The example illustrates a reduction of 10 lbs/acre of Nitrogen for the corn crop due to the change in Nutrient Management activities.*)

Table : Reductions or Increases of Primary Nutrient Inputs and/or Manure/Compost by Crop

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Cash Crop** | **N Reduction or Increase (lb/ac)** | **P Reduction or Increase (lb/ac)** | **K Reduction or Increase (lb/ac)** | **Manure/Compost Reduction or Increase (ton/ac)** |
| *E.g., Corn* | *- 10 lb/ac* | *0* | *0* |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

1. **If you apply manure or compost and purchase it off farm:**
	* How much do you pay per ton?
	* What type of manure or compost do you purchase?
2. Identify in table below any **reductions or increases** **in pesticides by crop** due to a change in Nutrient Management activities by providing the benchmark cost/acre (include chemical and application costs) for each pesticide category *before* you changed Nutrient Management activities and an estimated percent reduction or increase *due to* changing Nutrient Management activities. (*The example illustrates a 15% reduction in herbicide use in the soybean crop due to adopting Nutrient Management.)*

Table : Reductions or Increases in Pesticide Costs due to a Change in Nutrient Management Activities

|  |  |  |  |
| --- | --- | --- | --- |
| **Cash Crop** | **Herbicides** | **Insecticides** | **Fungicides** |
| **Benchmark Cost ($/ac)** | **% Change****(+/-)** | **Benchmark Cost ($/ac)** | **% Change****(+/-)** |  **Benchmark Cost ($/ac)** | **% Change****(+/-)** |
| *E.g., Soybean* | *$15/ac* | *-15%* | *0* | *0* | *0* | *0* |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

1. If you previously received or are currently receiving **financial assistance** for changing your Nutrient Management activities, please complete table below (*see example in the first gray row for guidance*):

***Note:*** *Any financial assistance payments listed are not included in the partial budget analysis because cost-share is temporary and not received by all but can be noted in the footnote of PBA table.*

Table : Financial Assistance History for Nutrient Management

|  |  |  |  |
| --- | --- | --- | --- |
| **Start Year and Ending Year** | **Source of Funding** | **Payment per Acre** | **Acres Enrolled** |
| *E.g., 2017 - 2020* | *NRCS - EQIP* | *$15* | *500* |
|  |  |  |  |
|  |  |  |  |

1. Describe in table below any **other benefits, costs,** **or changes in activities** that were not needed or added due to change in Nutrient Management activities *(e.g., increased frequency of soil testing)*:

Table : Other Benefits, Costs, or Changes in Activities due to a Change in Nutrient Management Activities

|  |  |  |
| --- | --- | --- |
| **Description of Other Benefit(s)** | **$/acre** | **Number of Acres Affected** |
|  |  |  |
|  |  |  |
| **Description of Other Cost(s)** | **$/acre** | **Number of Acres Affected** |
|  |  |  |
|  |  |  |

**COVER CROPS**

**TIP:** *If a particular effect cannot be attributed solely to adoption of cover crops, the user can enter it on the Combined Practice Effects section.*

1. Please provide in table below your **history of using Cover Crops** **by cash crop in the Study Area** (*see example in the first gray row for guidance*):

Table : History of Using Cover Crops

|  |  |  |  |
| --- | --- | --- | --- |
| **Cash Crop Following Cover Crop** | **First Year Using Cover Crop** | **Acres of Cover Crop in First Year** | **Current Cover Crop Acres** |
| *E.g., Soybeans* | *2016* | *40 acres* | *200 acres* |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

1. Please provide in table below information about **current Cover Crops** **by cash crop in the Study Area**, and below the table describe your cover crop management practices.

Table : Cover Crop Type, Seeding Rate, Establishment Cost, Termination Cost, and Other Cover Crop Costs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Cash Crop following Cover Crop** | **Cover Crop Type****(list all species in a mix)** | **Current Acres of Cover Planted\*** | **Cover Crop Seed ($/ac)** | **Establishment Cost ($/ac)** | **Termination Cost (description & $/ac)** | **Other Costs****(description & $/ac)**  |
| *E.g., Soybeans* | *Cereal Rye* | *100* | *$20* | *$25* | *$25* |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

*\*Current acres of cover planted should match previous table entries.*

* **Describe your cover crop management practices (including seeding rate in lbs/ac):**
1. Complete table below if you have observed a **yield decrease or increase** in any cash crops due to adopting Cover Crops in the Study Area. We suggest only entering changes in average yield below if Cover Cropping is the only soil health practice analyzed, otherwise enter yield impacts in the Combined Practice Effects tab. Remember, we are only looking for the change in cash crop yield due to cover crops, not because of other changes to cash crop production like increased plant population or changing seed varieties. (*The example illustrates that the average benchmark corn yield (150 bu/ac) increased by 5% due to planting cover crop before corn.*)

Table : Observed Change in Average Yield by Crop due to Adoption of Cover Crops

|  |  |  |
| --- | --- | --- |
| **Cash Crop** | **Benchmark Average Yield before Adopting Cover Crops (bu/ac or tons/ac)** | **Change in Average Yield** **due to Adopting Cover Crops****(+/- % change, bu/ac, or tons/ac)** |
| *E.g., Corn* | *E.g., 150 bu/ac* | *E.g., +20%, 30 bu/ac* |
|  |  |  |
|  |  |  |
|  |  |  |

1. **Is this estimated or reported yield?** \_\_\_\_\_\_ Estimated \_\_\_\_\_\_Yield Monitor
2. **Add any comments about weather impacts (drought year or wet spring) on yield:**
3. Identify in table below any **reductions or increases in primary nutrient inputs (N, P, K) used for a cash crop due to adopting Cover Crops.** *(The example illustrates a reduction of 30 lbs/ac of N for corn following a legume Cover Crop.)*

Table : Reductions or Increases in Primary Nutrient Inputs (N, P, K) by Cash Crop due to Adopting Cover Crops

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Cash Crop** | **N Reduction or Increase (lb/ac)** | **P Reduction or Increase (lb/ac)** | **K Reduction or Increase (lb/ac)** | **Additional Notes** |
| *E.g., Corn* | *E.g., -30 lbs corn/ac after legume cover crop* | *0* | *0* |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

1. Identify in table below any **reductions or increases** **in pesticide use by cash crop due to adopting Cover Crops** by providing the **benchmark cost/acre** (include chemical and application costs) for each pesticide category *before* you started Cover Cropping and an estimated percent reduction or increase *due to* adopting Cover Crops. **If cost of cover crop termination is included in table above, do not enter increased herbicide cost in table below.**  (*The example illustrates a 15% reduction in herbicide use in soybeans following a Cover Crop.)*

Table : Reductions or Increases in Pesticide Costs by Cash Crop due to Adopting a Cover Crop

|  |  |  |  |
| --- | --- | --- | --- |
| **Cash Crop** | **Herbicides** | **Insecticides** | **Fungicides** |
| **Benchmark Cost ($/ac)** | **% Change (+/-)** | **Benchmark Cost ($/ac)** | **% Change (+/-)** | **Benchmark Cost ($/ac)** | **% Change (+/-)** |
| *E.g., Soybean* | *E.g., $20/ac* | *E.g., -15%* | *0* | *0* | *0* | *0* |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

1. If you observed a **reduction in soil erosion** due to adopting Cover Crops, please answer the following questions:
	1. **Please describe any changes you may have visually observed in erosion on your farm due to adopting cover crops:**
	2. **Please estimate the** **Number of Acres that saw a reduction in the rate of sheet and rill erosion:** \_\_\_\_\_

***Note:*** *This could be the entire area where you are planting Cover Crops in cases where slopes are relatively uniform throughout or, if you are planting cover in a combination of relatively flat areas and steeper ground, the acreage could be the portion encompassed by the steeper ground.*

* 1. **Please provide your observed/estimated reduction in sheet and rill erosion:** \_\_\_\_\_\_\_\_ **Tons/Acre/Year**

***Note:*** *Enter tons of reduced erosion results modeled using any sediment reduction tool, such as the Nutrient Tracking Tool; enter the erosion reduction value from RUSLE-2 analysis if undertaken by your advisor; or any value that seems reasonable based on soil including zero.*

* 1. **Is mechanical erosion repair** **a typical part of your Study Area operation?** (Y/N) \_\_\_\_\_\_\_\_
		1. If yes, has adopting Cover Crops reduced the need for erosion repairs? (Y/N) \_\_\_\_\_\_\_\_
		2. If yes, please provide:
			1. An estimate of the **total annual DECREASE in mechanical erosion repair cost** due to adopting Cover Crops within your Study Area: - \_\_\_\_\_\_\_\_ **$/year**
			2. A **description** of the mechanical erosion repair activities within your Study Area that used to be carried out on an annual basis, and how/why the activities changed:
1. If you previously received or are currently receiving **financial assistance** for Cover Cropping, please complete table below (*see example in the first gray row for guidance*):

***Note:*** *Any financial assistance payments listed are not included in the partial budget analysis because cost-share is temporary and not received by all but can be noted in the footnote of PBA table.*

Table : Financial Assistance History for adopting Cover Crops

|  |  |  |  |
| --- | --- | --- | --- |
| **Start Year and Ending Year** | **Source of Funding** | **Payment per Acre** | **Acres Enrolled** |
| *E.g., 2017 - 2020* | *NRCS - EQIP* | *$15* | *500* |
|  |  |  |  |
|  |  |  |  |

1. Describe in table below any **other benefits, costs, or changes in activities** that were not needed or added due to adopting Cover Crops *(e.g., reduced irrigation cost due to better water holding capacity):*

Table : Other Benefits, Costs, or Changes in Activities due to Adopting Cover Crops

|  |  |  |
| --- | --- | --- |
| **Description of Other Benefit(s)** | **$/acre** | **Number of Acres Affected** |
|  |  |  |
|  |  |  |
| **Description of Other Cost(s)** | **$/acre** | **Number of Acres Affected** |
|  |  |  |
|  |  |  |

**GRAZING & HAYING OF COVER CROPS**

**Please answer the following questions if you graze Cover Crops or harvest Cover Crops for hay in your Study Area:**

1. **Grazing Infrastructure Costs in $/ac:**

|  |  |
| --- | --- |
| * Fence ($/ac):
 | * Watering Facilities ($/ac):
 |
| * Additional Labor and Management ($/ac):
 | * Other Annual Grazing Cost ($/ac):
 |

1. Please describe your **Cover Crop grazing system** in the applicable row(s) in the table below:

Table : Cover Crop Acres Grazed and Grazing Information

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type of Herd** | **Cover Crop Acres Grazed (Acres)** | **Number Days Cover is Grazed** | **Stocking Rate (AU/Ac)** | **Forage Demand (Lb/AU/Day)** |
| Dairy Cows |  |  |  |  |
| Cow/Calf |  |  |  |  |
| Stockers |  |  |  |  |

1. Provide any additional information related to the **benefits or costs of grazing Cover Crops** in your operation (e*.g., number days of fall grazing were extended or ability to start spring grazing earlier by a number of days):*
2. If you **harvested hay from your Cover Crops**:
	* How many acres did you harvest? \_\_\_\_\_\_\_\_\_\_\_
	* What was your hay yield (ton/ac)? \_\_\_\_\_\_\_\_\_\_\_
* What do you estimate are your harvesting costs ($/ac)? \_\_\_\_\_\_\_\_\_\_\_
* What additional costs are incurred? \_\_\_\_\_\_\_\_\_\_\_

**COMBINED PRACTICES EFFECTS**

1. Complete table below if you observed a **yield decrease or increase** in any cash crops due to adopting a combination of soil health practices in the Study Area. (*The example illustrates that the average benchmark corn yield (150 bu/ac) increased by 10% due to adopting a combination of soil health practices.*)

Table : Observed Change in Average Yield by Crop due to Adopting a Combination of Soil Health Practices

|  |  |  |
| --- | --- | --- |
| **Cash Crop** | **Benchmark Average Yield** **Before Adopting Soil Health Practices** **(bu/ac or tons/ac)** | **Change in Average Yield** **Due to Adopting Soil Health Practices****(+/- % change, +/- bu/acre or tons/acre)** |
| *E.g., Corn* | *150 bu/ac* | *+10% increase* |
|  |  |  |
|  |  |  |
|  |  |  |

* 1. **Is this estimated or reported yield?** \_\_\_\_\_\_ Estimated \_\_\_\_\_\_Yield Monitor
	2. **Add any comments about the impact of the weather (drought year or wet spring) on yield:**
1. Identify in table below any **reductions or increases** **in primary nutrient inputs (N, P, K)** **by crop** due to adopting a combination of soil health practices in the Study Area. *(The example illustrates a reduction of 30 lbs/acre of Nitrogen based on new Nutrient Management activities and adopting a legume Cover Crop prior to corn.)*

Table : Reductions or Increases in Primary Nutrient Inputs due to the Combination of Soil Health Practices

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Cash Crop** | **N Reduction or Increase (lb/ac)** | **P Reduction or Increase (lb/ac)** | **K Reduction or Increase (lb/ac)** | **Additional Notes** |
| *E.g., Corn* | *-30lbs due to NM and legume cover crop* | *0* | *0* |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

1. Identify in table below any **reductions or increases** **in pesticides** **by crop** due to adopting a combination of soil health practices in the Study Area by providing the benchmark cost/acre (include chemical and application costs) for each pesticide category *before* you adopted soil health practices and the percent reduction or increase *due to* adopting soil health practices. (*The example illustrates a 50% increase in herbicide cost from a benchmark cost of $20/acre in the soybean crop where cover cropping and reducing tillage increased herbicide expenses.)*

Table : Reductions or Increases in Pesticide Costs due to Adopting the Combination of Soil Health Practices

|  |  |  |  |
| --- | --- | --- | --- |
| **Cash Crop** | **Herbicides** | **Insecticides** | **Fungicides** |
| **Benchmark Cost ($/ac)** | **% Change (+/-)** | **Benchmark Cost ($/ac)** | **% Change (+/-)** | **Benchmark Cost ($/ac)** | **% Change (+/-)** |
| *E.g., Soybean* | *$20/ac* | *+50% due to No-Till and Cover Crop* | *0* | *0* | *0* | *0* |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

1. If you observed a **reduction in soil erosion** due to the combination of soil health practices adopted in the Study Area, please answer the following questions:
	1. **Please describe any changes you may have visually observed in erosion on your farm:**
	2. **Please estimate the Number of Acres that saw a reduction in the rate of sheet and rill erosion:** \_\_\_\_\_\_

***Note:*** *This could be the entire Study Area in cases where slopes are relatively uniform throughout or, if the area is comprised of a combination of relatively flat areas and steeper ground, the acreage could be the portion encompassed by the steeper ground.*

* 1. Please provide your **observed/estimated reduction in sheet and rill erosion:** \_\_\_\_\_\_\_\_ **Tons/Acre/Year**

***Note:*** *Enter tons of reduced erosion results modeled using any sediment reduction tool, such as the Nutrient Tracking Tool; enter the erosion reduction value from RUSLE-2 analysis if undertaken by your advisor; or any value that seems reasonable based on soil including zero.*

* 1. **Is mechanical erosion repair a typical part of your Study Area operation?** (Y/N) \_\_\_\_\_\_\_\_
		1. If yes, has adopting these practices reduced the need for erosion repairs? (Y/N) \_\_\_\_\_\_\_\_
		2. If yes, please provide:
			1. An estimate of the **total annual DECREASE in mechanical erosion repair cost** due to adopting these soil health practices within your Study Area: - \_\_\_\_\_\_\_\_\_\_\_\_ **$/year**
			2. A **description** of the mechanical erosion repair activities within your Study Area that used to be carried out on an annual basis, and how/why the activities changed with adoption of the soil health practices:
1. Describe in table below any **other benefits, costs, or other changes in activities** that were not needed or added due to adopting soil health practices *(e.g., additional management costs*):

Table : Other Benefits, Costs, or Changes in Activities due to Adopting the Combination of Soil Health Practices

|  |  |  |
| --- | --- | --- |
| **Description of Other Benefit(s)** | **$/acre** | **# Acres Affected** |
|  |  |  |
|  |  |  |
|  |  |  |
| **Description of Other Cost(s)** | **$/acre** | **# Acres Affected** |
|  |  |  |
|  |  |  |
|  |  |  |

**CONSERVATION CROP ROTATION (CCR)**

**WARNING:** *At this time, the adoption of a Conservation Crop Rotation cannot be analyzed with other soil health practices due to data discrepancies. Users can only analyze a Conservation Crop Rotation as a sole soil health practice. Additionally, corn silage cannot be analyzed here because there is no net income data for corn silage. See R-SHEC Tool for more info (specifically, the “ONLY CCR” tab).*

1. Please complete the following information about your **crop rotation history** if you changed your crop rotation to improve your soil health (i.e., Conservation Crop Rotation)**:**

**Benchmark Crop Rotation:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Current Crop Rotation:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**First Year Adopted:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_ **First Year Acreage:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_ **Current Acreage:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Complete table below if you observed a **yield** **decrease or increase** in any cash crops due adopting a CCR in the Study Area. Remember, we are only looking for the change in yield due to adopting a CCR, not because of other changes to production like increased plant population or changing seed varieties. (*The example illustrates that the average benchmark corn yield (150 bu/ac) increased by 30% due to adopting a CCR.*) **Please note that the R-SHEC Tool’s calculation of change in net income with a CCR accounts for the yield differences between crops.**

Table : Observed Change in Average Yield by Crop with Adoption of a Conservation Crop Rotation (CCR)

|  |  |  |
| --- | --- | --- |
| **Cash Crop** | **Benchmark Average Yield Before Adopting CCR (bu/acre or tons/acre)** | **Change in Average Yield Due to Adopting CCR****(+/- % change, +/- bu/acre, or tons/acre)** |
| *E.g., Corn* | *E.g., 150 bu/ac* | *E.g., +30% increase* |
|  |  |  |
|  |  |  |
|  |  |  |

1. **Is this estimated or reported yield?** \_\_\_\_\_\_ Estimated \_\_\_\_\_\_Yield Monitor
2. **Add any comments about the impact of the weather (drought year or wet spring) on yield:**
3. Identify in table below any **reductions or increases** **in primary nutrient inputs (N, P, K)** **by crop** due to changing to a Conservation Crop Rotation in the Study Area. *(The example illustrates a reduction of 30 lbs/acre of Nitrogen for the corn following hay when hay is introduced into the rotation.)* **Please note that the net income data accounts for the nutrient differences between crops.**

Table : Reductions or increases in primary nutrient inputs (N, P, K) due to change in crop rotation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Cash Crop** | **N Reduction or Increase (lb/ac)** | **P Reduction or Increase (lb/ac)** | **K Reduction or Increase (lb/ac)** | **Additional Notes** |
| *E.g., Corn after Hay* | *-30 lbs* | *0* | *0* |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

1. Identify in table below any **reductions or increases** **in pesticides** **by crop** due to changing to a CCR by providing the benchmark cost/acre (include chemical and application costs) for each pesticide category *before* you started your Conservation Crop Rotation and an estimated reduction or increase *due to adopting* a CCR. (*The example illustrates a 15% reduction in insecticide use in the soybean crop where use of a CCR breaks the pest cycle.*) Please note that the net income data accounts for the pesticides differences between crops.

Table : Reductions or Increases in Pesticide Costs due to Change in Crop Rotation

|  |  |  |  |
| --- | --- | --- | --- |
| **Cash Crop** | **Herbicides** | **Insecticides** | **Fungicides** |
| **Benchmark Cost ($/ac)** | **% Change** **(+/-)** | **Benchmark Cost ($/ac)** | **% Change** **(+/-)** | **Benchmark Cost ($/ac)** | **% Change** **(+/-)** |
| *E.g., Soybean* |  |  | *$20* | *-15%*  | *0* | *0* |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

1. If you observed a **reduction in soil erosion** due to changing to Conservation Crop Rotation, please answer the following questions:
	1. **Please describe any changes you may have visually observed in erosion on your farm due to adopting a CCR:**
	2. **Please estimate the Number of Acres that saw a reduction in the rate of sheet and rill erosion:** \_\_\_\_\_\_

*Note: This could be the entire acreage of your rotation in cases where slopes are relatively uniform throughout or, where the rotation is comprised of a combination of relatively flat areas and steeper ground, the acreage could be the portion encompassed by the steeper ground.*

* 1. **Please provide your observed/estimated reduction in sheet and rill erosion:** \_\_\_\_\_\_\_\_ **Tons/Acre/Year**

***Note:*** *Enter tons of reduced erosion results modeled using any sediment reduction tool, such as the Nutrient Tracking Tool; enter the erosion reduction value from RUSLE-2 analysis if undertaken by your advisor; or any value that seems reasonable based on soil including zero.*

* 1. **Is mechanical erosion repair a typical part of your Study Area operation?** (Y/N) \_\_\_\_\_\_\_\_
		1. If yes, has changing to a Conservation Crop Rotation reduced the need for erosion repairs? (Y/N) \_\_\_\_\_\_\_\_
		2. If yes, please provide:
			1. An estimate of the **total annual DECREASE in mechanical erosion repair cost** due to changing your crop rotation within your Study Area: - \_\_\_\_\_\_\_\_ **$/year**
			2. A **description** of the mechanical erosion repair activities within your Study Area that used to be carried out on an annual basis, and how/why the activities changed due to changing to a Conservation Crop Rotation:
1. If you previously received or are currently receiving **financial assistance** for implementing a Conservation Crop Rotation, please complete table below (*see example in the first gray row for guidance*):

***Note:*** *Any financial assistance payments listed are not included in the partial budget analysis because cost-share is temporary and not received by all but can be noted in the footnote of PBA table.*

Table : Financial Assistance History for Implementing a Conservation Crop Rotation

|  |  |  |  |
| --- | --- | --- | --- |
| **Start Year and Ending Year** | **Source of Funding** | **Payment per Acre** | **Acres Enrolled** |
| *E.g., 2017 - 2020* | *NRCS - EQIP* | *$5* | *500* |
|  |  |  |  |
|  |  |  |  |

1. Describe in table below **any other benefits, costs, or changes in activities** that were not needed or added due to adopting a Conservation Crop Rotation (*e.g., additional management costs*).

Table : Other Benefits, Costs, or Changes in Activities due to Adopting a Conservation Crop Rotation

|  |  |  |
| --- | --- | --- |
| **Description of Benefit** | **$/acre** | **Number of Acres Affected** |
|  |  |  |
|  |  |  |
|  |  |  |
| **Description of Cost** | **$/acre** | **Number of Acres Affected** |
|  |  |  |
|  |  |  |
|  |  |  |

# Changes in the Soil

This part of the interview records information about how the soil has changed following adoption of soil health practices. As in Section I, your answers will be used in writing the case study itself and is not used by the calculator for determining the change in net income.

1. **Please list the predominate soil types within your Study Area:**
2. **Have you observed changes in your soil properties that you attribute to the soil health practice(s) you have adopted?** If yes, please describe the changes.
3. **Do you have soil organic matter test records from fields in your Study Area?** If yes, please fill out table below.

Table : Study Area Soil Organic Matter Test Records

|  |  |  |  |
| --- | --- | --- | --- |
| **Year of Soil Test** | **Soil Organic Matter Value (%)** | **Year of Soil Test** | **Soil Organic Matter Value (%)** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

* 1. **Average SOM value for the years before you started using your first soil health practice:** \_\_\_\_\_\_\_\_

1. **Have the soil health practices made your crop more resilient to extreme weather or pest pressure?** If yes, please fill out table below.

Table : Extreme Weather or Pest Pressure

|  |  |  |  |
| --- | --- | --- | --- |
| **Type of Weather** | **Year Experienced** | **Effect on Crop Yields (by crop)** | **Did Soil Health Practices Help?** |
| Excessive Precipitation |  |  |  |
| Drought |  |  |  |
| Excessive Temperature |  |  |  |
| Pest Pressure  |  |  |  |