Soil Health Benchmark Study:

Maintaining Field Management Records - Row Crop

For the current calendar year, research collaborators maintain field management records for each of their three research fields on (1) planting and termination dates, (2) soil disturbance and equipment activity,, (3) soil amendments, (4) animal and grazing activity, and (5) pesticide records (row crop farmers only). These are standard records that many research collaborators are likely already maintaining. *Maintaining field management records is required for research collaborators.*

Your records allow us to calculate soil health management indicators, like days of living cover, days of cover crops, tillage intensity index, and organic matter inputs, for your farm and soil health research fields. These indicators can provide deeper understanding of how your management practices impact your soil health outcomes. For details on how we calculate some of these indicators, please see our Comprehensive Methods Guide, found on the [soil health research collaborator webpage](#).

Field management records are due by **January 20, 2024.** Please submit your records to your study coordinator using the several options below on or before this date. Please review these instructions, example tables, and table notes carefully.

How to maintain (and submit) field records

You have several options for maintaining and submitting field records. Records can be maintained and submitted using an online survey tool, template forms that we provide, or your own digital or paper records, so you do not have to change your record-keeping system.

- **Preferred method: Our online survey tool through SurveyStack.** <u>This is especially preferred for submitting records.</u> *All farmers with an email address receive an invitation to join this web platform to access the survey.*

    Why use this method: You can access your survey throughout the year using your desktop computer or smartphone to enter your field management records. This tool uses the same format as our other record templates, but there are also features that make entering your records easy—like drop down selection boxes and the ability to quickly copy similar entries. We're also able to more quickly organize and analyze your records, which means we can send you insights and reports sooner!

If you would like guidance in submitting your field management records through SurveyStack, please reach out to Pasa's research team at researchteam@pasafarming.org; 814-349-9856.

- **Alternative method: Use our field management record templates.**
  - For downloadable electronic record templates or printable record templates, please visit the soil health research collaborator webpage: https://pasafarming.org/soil-health-research-collaborators/
  - For print copies to be mailed to you, please reach out to your study coordinator. (For print copies to be mailed to you, please reach out to your study coordinator (for Pasa: researchteam@pasafarming.org; 814-349-9856)

- **Alternative method: Use your own records.** If you are submitting your own records, please review the field records protocol to make sure that all necessary information is provided.

Improve your record keeping with farmOS: With this flexible, online record keeping system, you can keep track of all your records throughout the year, and then send us the necessary information at the end of the season. Contact Pasa's research team for more information.

What field records to keep

Please see page 5 for examples of field management record tables and detailed notes. Here is an overview of what should be included in the field management records for each designated research field:

1. **Planting and termination dates:**

   (These records allow us to calculate the days of living cover and days of cover crop for the entire year for your research fields.)

   a. **All fields:** These records include planting and termination dates for any cash crops and cover crops growing during the year in your research fields.

      i. This includes any perennial covers or cover crops overwintered from the previous fall.

      ii. If possible, please approximate any future winter kill and termination dates for the appropriate crops.

       i. Please include the species for any cover crop mixes or if available, the commercial brand name of the mix.

b. Vegetable fields: These records should focus on in-field operations only—transplant seeding dates in the greenhouse are not necessary to record for this study.

c. Row crop fields: These records should also include crop yields, seeding rates, and seed prices which we are using for a soil health economic benchmarking project.

       i. For cover crop mixes, please list each species in a separate row if the cover crop mix is a personal blend, so that we can capture the appropriate rates and prices. If it's a commercial mix, it does not have to be entered in separate rows, but please include the commercial brand name as well.

d. Fields or paddocks for pastured livestock: Even if your research fields are in perennial pasture, please account for these fields.

       i. Please give us an approximate date of perennial pasture establishment and a species mix, if known.

       ii. Any pasture reseeding should also be noted in these records.

2. **Soil disturbance and equipment activity:**

   (These records allow us to calculate a tillage intensity rating for the entire year for your research fields.)

   a. All fields: These records include all tractor or human-powered equipment and machinery that enter each research field and can cause compaction or can disturb the soil in some way.

          i. This includes all tillage equipment, planters, harvesters, cultivators, sprayers, mowers, and human-powered equipment like cultivation hoes. Please do your best to provide all of this information!

          ii. Please provide the approximate tillage depth and an approximate speed (in miles per hour)of each tractor event. Designate depth by the terms: shallow, medium, deep. Designate speed by the terms: slow, medium, fast.

          iii. When making multiple passes, record each individual pass as a separate soil disturbance or equipment activity event.

          iv. Optional: If desired you can provide the make and/or model of equipment used. This can be helpful when matching your equipment to our list.

3. **Soil amendments:**

   (These records allow us to calculate total organic matter inputs for the entire year for your research fields.)

   a. **All fields:** These records include all soil amendments applied to research fields, including manure, compost, lime, mulch, and purchased fertilizers.

      i. Please also provide any soil amendments added through irrigation systems or amendments applied as a foliar spray.

      ii. We request the full product name for purchased soil amendments.

      i. For manure or compost products applied on these fields, we request the main ingredients and any analysis results, if available.

   b. **Vegetable fields:** These records should focus on in-field operations only—amendments added to potting mixes for transplant production are not necessary to record for this study.

   c. **Fields or paddocks for pastured livestock:** At this time, we do not ask for records of manure deposited by grazing or pastured animals.

      i. Please include any applications of manure from a barn, storage tank, or sourced from another farm.

      ii. Any bale feeding in pastures or paddocks should be included.

4. **Grazing and pasturing events:**

   (These records allow us to calculate stocking density and grazing intensity indicators for the entire year for your research fields.)

   a. **Fields or paddocks for pastured livestock:** These records include grazing and pasturing events in all research fields, including the number and type of livestock, time spent in a field or paddock, and the number of sub-paddocks for each grazing event, if applicable.

5. **Spray Records** *(Row crop farmers only)***:**

   a. For all row crop fields, we are asking for spray records to be used for a soil health economic benchmarking project. This includes 1) pesticides used for crop burndown, weed control, or pest and disease problems and 2) adjuvants, surfactants,or stabilizers. Please include date, full product name, and total amount applied before dilution.

Row crop and grain farm record table examples

Please note:

- *These tables are meant to be important highlights of what should be included in your field management records. They do not represent the full management history of a working farm in the SHBS.*
- *If using SurveyStack to submit records online, there are a few differences of how to report information from what is shown in the example tables below. These differences are explained in our SurveyStack survey.*

A. Planting and termination dates

Farm	Field ID	Field Area (acres)	Planting Date *1	Crop *2a	Cover Crop *2b	Entire Cover Crop Winterkilled in 23/24? *2c	Area Planted *3	Area Planted Unit *4	Termination Date *5	Seeding Rate *6	Seed Variety or Name *7	Seed Price *8	Yield
Your Farm	F1	12	10.15.22	Winter Rye	Y	N	100	% of field	5.17.23	60 lbs/ac		$25/50 lbs	
Your Farm	F1	12	10.15.22	Vetch	Y	N	100	% of field	5.17.23	25 lbs/ac	AU Merit	$114/50 lbs	
Your Farm	F1	12	5.17.23	Corn	N	N/A	100	% of field	10.25.23	30K/ac	KF 52C20	$185/80 K sds	180 bu/ac
Your Farm	F1	12	11.23.23	annual ryegrass, triticale	Y	N	100	% of field	Spring 2024	100 lbs/ac	King's Triticale Plus	$39/50 lbs	
Your Farm	F2	22	4.15.22	Alfalfa	N	N/A	100	% of field	Fall 2023	22 lbs/ac	Kingfisher 101	$189/50 lbs	4 tons/ac

*1 For direct seeded events, list seeding date; for transplanting events, list transplant date. Exact dates are important, except if the date is from a previous calendar year, in which case your best estimate is acceptable.

*2a For cover crop mixes, please list each species in a separate row if the cover crop mix is a personal blend, so that we can capture the appropriate rates and prices. If it's a commercial mix, it does not have to be entered in separate rows, but please include the commercial brand name as well.

*2b Specify if the crop listed in (2a) is a cover crop with a "Y" for Yes and "N" for No. Cover crops do not include cash crops, hay, or pasture. For example, if wheat is to be harvested for grain and feed, it is considered a cash crop, and thus you would enter "N".

*2c If planting is a cover crop, specify if the entire cover crop will Winterkill in 2023/2024 with "Y" for Yes and "N" for No or if not applicable, "N/A"

*3 For each planting event, report the total area seeded or transplanted. For example, if corn is planted over an entire field, record 100%. If cover crops are planted over a third of the field, record 33%.

*4 Use this column to record the unit for the Area Planted in the previous column. Units of Area Planted can be in acres or percentage of the field. For row crops or cover crops, percentage of the field are the preferred units. For instance, if you are reporting 100% of the field, enter "% of the field here."

*5 Termination dates may coincide with a tillage event, harvest date, herbicide application or an estimated date of winterkill, if applicable. Exact dates are important, except if this date will be in a future calendar year, in which case your best estimate is acceptable.

*6 Lbs/acre or the seed population/acre are the preferred seeding rates.

*7 List the variety or name of the seed in this column, if available.

*8 Use this column to list the dollar price of the seed. These units should match the seeding rate units. Price per pound or price per seed count are the preferred units.

B. Soil disturbance and equipment activity

Farm	Field ID	Field Area (Acres)	Date	Implement *1	Disturbance Depth *2 "N/A" "shallow" "medium" "deep"	Speed *3 "slow" "medium" "fast"	Area Covered *4	Area Covered Unit *5
Your Farm	F1	12	3.10.23	Manure Spreader	N/A	fast	100	% of field
Your Farm	F1	12	5.17.23	Tank Sprayer	N/A	fast	100	% of field
Your Farm	F1	12	5.17.23	John Deere 7000 30" Planter	shallow	medium	100	% of field
Your Farm	F1	12	10.25.23	Combine	N/A	medium	100	% of field
Your Farm	F1	12	11.23.23	John Deere 3800 Grain Drill	shallow	medium	100	% of field
Your Farm	F2	22	5.28.23	Haybine	N/A	medium	100	% of field
Your Farm	F2	22	5.28.23	Rake	N/A	fast	100	% of field
Your Farm	F2	22	5.28.23	Baler	N/A	fast	100	% of field
Your Farm	F2	22	6.04.23	Lime Spreader	N/A	medium	100	% of field

*1 Please include applicable details that will help us understand the equipment you are using. For example, instead of putting "cultivator" you could put "two row shovel cultivator" or optionally, a make or model.

*2 If applicable, please provide the approximate depth of disturbance for 0 enter "none", 0.5-4" enter "shallow", 5-8" enter "medium", 9"+ enter "deep"

*3 Please provide the approximate speed of equipment for slow=under 2mph, medium=2-5mph, fast=5+

*4 Report the total area covered by equipment activity. For instance, if you pass over a third of the field with a seeding drill, report 33% and do not attempt to estimate the actual area disturbed by the cultivator shanks vs. the undisturbed row space. If mowing an entire pasture, simply report 100%. If you make multiple passes, record each individual pass as a separate event.

*5 Use this column to record the unit for Area Covered in the previous column. Units of Area Covered can be in acres, percentage of the field, or other units that are convenient for your record keeping. Acres or percentage of the field are the preferred units. For instance, if you are reporting 33% as the Area Covered, enter "%" here.

C. Soil and fertilizer amendments

Farm	Field ID	Field Area (acres)	Date	Product Name (*1)	Brand	Area Covered (*2)	Area Covered Unit (*3)	Quantity (*4)	Quantity Unit (*5)	% moisture content *6	% total N (as is) *6	% total P (as is) *6
Your Farm	F1	12	3.10.23	Dairy Manure		100	% of field	40	tons	58	0.3	0.2
Your Farm	F1	12	5.21.23	28-0-0 UAN		100	% of field	1400	lbs			
Your Farm	F2	22	6.04.23	AG-Dolomite Lime	Bakers	100	% of field	12	tons			

*1 Please provide the detailed product name and if available, please send us analysis results for any manure or compost products applied on your fields. For any compost product, please list the main ingredients.

*2 For soil amendments, report the total area covered with amendment application equipment. For instance, if a manure spreader is used to apply manure to a third of a field, report 33%.

*3 Use this column to record the unit for Area Covered in the previous column. Units of Area Covered can be in Acres, percentage of the field, or other units that are convenient for your record keeping. For instance, if you are reporting 33% as the Area Covered, enter "%" here.

*4 It is preferable to report the total quantity applied of each amendment (e.g. tons or pounds). You can also report the rate (e.g. tons/ac). If you are applying liquid, please report the quantity prior to any dilution.

*5 Use this column to record the unit for the Quantity in the previous column. For instance, if you are reporting 1.5 tons, enter "tons" here.

*6 Use these sections to record key information from analysis results for any manure or compost products, if available.

D. Pesticide records

Farm	Field ID	Field Area (acres)	Date	Brand and Product Name (*1)	Area Covered (*2)	Area Covered Unit (*3)	Quantity of Product (*4)	Quantity Unit (*5)
Your Farm	F1	12	6/30/23	RoundUp Power Max 3	100	% of field	20	fl oz/ac
Your Farm	F2	22	8/1/23	Entrust	100	% of field	22	oz

*1 Please provide the detailed brand and product name.

*2 Report the total area covered with the product application equipment. For instance, if a sprayer is used to apply a pesticide to a third of a field, report 33%.

*3 Use this column to record the unit for Area Covered in the previous column. Units of Area Covered can be in bed feet, Acres, percentage of the field, or other units that are convenient for your record keeping. For instance, if you are reporting 33% as the Area Covered, enter "%" here.

*4 Please report the quantity prior to any dilution. It is preferable to record the total quantity applied to the field of each product (e.g. ounces or pounds). You can also report the rate (e.g. oz per acre).

*5 Use this column to record the unit for the Quantity in the previous column. For instance, if you are reporting 20 oz, enter "oz" here.