



COMET-Farm Training for SWCDs: Cropland

October 29, 2025



COMET
Farm



Natural Resources Conservation Service
U.S. DEPARTMENT OF AGRICULTURE

Estimate your whole farm and ranch carbon sequestration and greenhouse gas emissions using COMET-Farm

Describe your farm and ranch management to generate an estimate comparing soil carbon and greenhouse gas emissions between scenarios

[Projects](#)



- Estimation of whole farm greenhouse gas emission and carbon sequestration
- Helps compare scenarios
 - If a farm implements X BMP, greenhouse gas emissions will change Y amount



- Developed for the USDA by scientists at Colorado State University
- Whole-farm greenhouse gas (GHG) accounting tool
- Web-based and free
- Can be used in a variety of systems
 - Today's focus is cropland
 - But many other systems are possible



- COMET-Farm Home
 - <https://comet-farm.com/home>
- COMET-Farm Manual
 - https://comet-farm.com/COMET-Farm_Manual.pdf
 - Cropland instructions begin on page 19
- Data Inputs Sheet
 - <https://cometfarm.freshdesk.com/support/solutions/articles/64000179572-data-entry-steps-for-cropland-project>



- Other Recorded Trainings for COMET-Farm
 - Agroforestry (Silvopasture)
 - Animal Agriculture (Prescribed Grazing and Feed Management)



- Cropland BMP training
 - Background on COMET-Farm
 - Navigating the COMET-Farm Website
 - COMET-Farm organization
 - Project walkthrough
 - Reporting

Why is COMET-Farm a part of our project?



- 10% of total project acres must be run through COMET-Farm
- No individual requirement for each SWCD
- But COMET-Farm provides benefits
 - More information for grower/producer
 - More precise results
 - Practice implementation may be unique



- Conservation Crop Rotation (328)
- Cover Crops (340)
- Nutrient Management (592)
- Pasture and Hay Planting (512)
- No-till and reduced till (329, 345)

Getting Started

Registering for a COMET-Farm Account



Welcome

Register for COMET-Farm Account

☐

I have read and agree to the [Terms and Conditions](#)*

☐

Subscribe to COMET-Quarterly Newsletter and Tool Updates

Register Account

Registering for a COMET-Farm Account



Welcome

Register for COMET-Farm Account

First Name (Required) *

Last Name (Required) *

Email (Required) *

Password *

Confirm Password *

Sector

Company /Organization Name (Optional)

☐

I have read and agree to the [Terms and Conditions](#) *

☐

Subscribe to COMET-Quarterly Newsletter and Tool Updates

Register Account

Email needs to be
verified before
continuing.



Guide: Select Accounting Activities



Cropland, Pasture, Range, Orchards/Vineyards:

Uses DayCent to account for soil-related emissions resulting from management practices such as planting dates, tillage, and fertilizer application. Emission estimates will only relate to soil-related emissions within the defined entity or entities (i.e., fields, pastures, vineyards, etc.).



Animal Agriculture:

Uses empirical calculations to estimate emissions resulting from livestock management practices, such as how the animals are housed or how manure is handled. Emission estimates will only relate to emissions related to livestock within the defined entity (i.e., heads of cattle, poultry, swine, etc.).



Agroforestry:

Uses empirical calculations to estimate emissions resulting from agroforestry practices such as silvopasture systems, riparian buffers, or windbreaks.



Forestry:

Uses empirical calculations to estimate emissions resulting from forestry management practices such as clear-cut harvesting.



- Understanding of key rotation information for the field(s) where the practice(s) are implemented
 - Crops, planting/harvesting dates and information, nutrients, tillage, irrigation, etc.
- Information about the BMP and associated changes in management
- Full input sheet linked earlier in training



Project "Alliance Test" Roadmap [?]



Projects



Field Location



Field Management



Scenario Management



Report

Starting a Project

Starting a Cropland project



Aaron's Projects

Select "New Project" to Begin

BULK ACTION

IMPORT PROJECT

DEMO PROJECT

NEW PROJECT

Starting a project – naming, selecting activity



New Project

1

Project Name (required)

Project Notes (optional)

2

Select Accounting Activities [?]

You may select multiple activities within one project; however, reported emissions will be each generated in their own report.

- ☐  **Cropland, Pasture, Range, Orchards/Vineyards**
- ☐  **Animal Agriculture**
- ☐  **Agroforestry**
- ☐  **Forestry**

Please select at least one activity.

Cancel

Enter Management

Setting a baseline – (at least) 5 baseline years



New Project

1

Project Name (required)

Project Notes (optional)

2

Select Accounting Activities ?

You may select multiple activities within one project; however, reported emissions will be each generated in their own report.

☒

Cropland, Pasture, Range, Orchards/Vineyards

☐

Animal Agriculture

☐

Agroforestry

☐

Forestry

Please s

3

Cropland, Pasture, Range, Orchard/Vineyard Baseline Years

Baseline Start Year: Baseline Start

Baseline End Year: Baseline End

Cancel

Enter Management

For 2024 practice implementation, set baseline to end in 2023



Project "Alliance Test" Roadmap [?]



Projects



Field Location



Field Management



Scenario Management



Report



Project "Alliance Test" Roadmap [?]



Projects



Field Location



Field Management



Scenario Management



Report

Field location – field boundaries



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Draw field boundary

Map View

350th Ave

Project "Alliance Test" Roadmap ②

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Projects

Field Location

Field Management

Scenario Management

Report

Field location – drawing a polygon



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Map View

Most commonly used

350th Ave

Project "Alliance Test" Roadmap ②

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Field Location

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Field Management

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Scenario Management

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Report

Field location – uploading shape file



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Map View

350th Ave

Upload Shape File

Project "Alliance Test" Roadmap ②

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Projects

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Field Location

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Field Management

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Scenario Management

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Report



Choosing the field provides climate (precipitation, temperature, etc.) and soils data to the model.

350th Ave

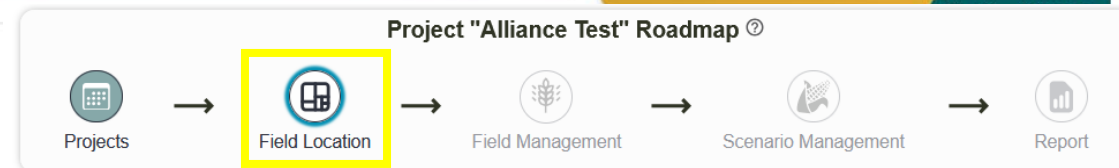
Map View

Project "Alliance Test" Roadmap 2

Projects → **Field Location** → Field Management → Scenario Management → Report

Fields (2/50)	Acres	Edit
Soy	74	
CS	146	

Finished Defining Fields





Project "Alliance Test" Roadmap ?



Projects



Field Location



Field Management



Scenario Management



Report



1 Select Field ?

Using the dropdown menu below or the interactive map, select each field to add crops and management.

Select a field
Soy



2 Historic Management: Soy ?

Using the dropdown menus, select the historic management that best represents the management of this field prior to the baseline period.

Pre-1980 Management

Select management

Was this field enrolled in Conservation Reserve Program (CRP) prior to the baseline period?

☐ Yes ☒ No

1980 to the Beginning of Baseline Period Management

Select management

Save

Project "Alliance Test" Roadmap ?



Projects



Field Location



Field Management



Scenario Management



Report



1 Select Field ?

Using the dropdown menu below or the interactive map, select each field to add crops and management.

Select a field
Soy



2 Historic Management: Soy ?

Using the dropdown menus, select the historic management that best represents the management of this field prior to the baseline period.

Pre-1980 Management

Select management

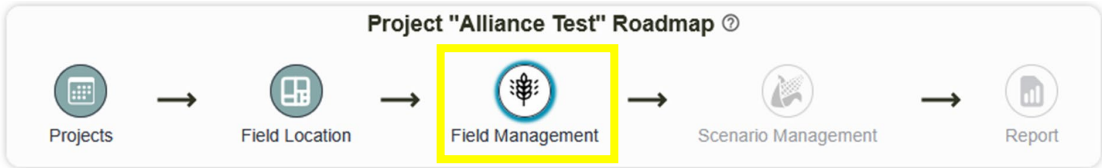
Was this field enrolled in Conservation Reserve Program (CRP) prior to the baseline period?

☐ Yes ☒ No

1980 to the Beginning of Baseline Period Management

Select management

Save





1 Select Field ?

Using the dropdown menu below or the interactive map, select each field to add crops and management.

Select a field
Soy




Data
Incomplete


Data
Complete


Selected

2 Historic Management: Soy ?

Using the dropdown menus, select the historic management that best represents the management of this field prior to the baseline period.

Pre-1980 Management

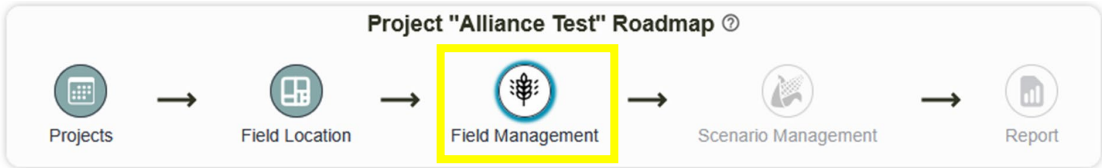
Select management

Was this field enrolled in Conservation Reserve Program (CRP) prior to the baseline period?
☐ Yes ☒ No

1980 to the Beginning of Baseline Period Management

Select management

Save





1 Select Field ?

Using the dropdown menu below or the interactive map, select each field to add crops and management.

Select a field

Soy



2 Historic Management: Soy ?

Using the dropdown menus, select the historic management that best represents the management of this field prior to the baseline period.

Pre-1980 Management

Select management

Was this field enrolled in Conservation Reserve Program (CRP) prior to the baseline period?

☐ Yes ☒ No

1980 to the Beginning of Baseline Period Management

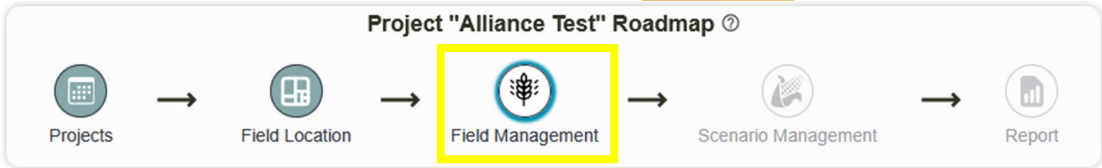
Select management

Non-Irrigated: Annual Crops in Rotati

1980 to the Beginning of Baseline Period Tillage

Select a tillage

Save



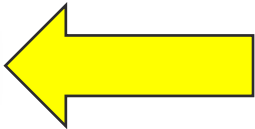


3 Baseline Crops & Management: Soy[?]



- 1. Using the dropdown menu for each year, or using the "Crop Template" button, add crop(s) that were **planted** for each year.
COMET cannot support multiple crops growing at the same time, with the exception of predefined cover crop blends and cover crops in an orchard/vineyard system.
- 2. Using the "pencil" icon, edit or add management for each crop year.
- 3. If no crop is **planted** in a given year, select fallow as your "crop".
- 4. When applicable, use the  to copy management from one year/field to another.

Crop Rotation Builder



Year	Planted Crop 1 *	Planted Crop 2	Planted Crop 3
2019	Select a crop...	Select a crop...	Select a crop...
2020	Select a crop...	Select a crop...	Select a crop...



Crop Rotation Builder [?]

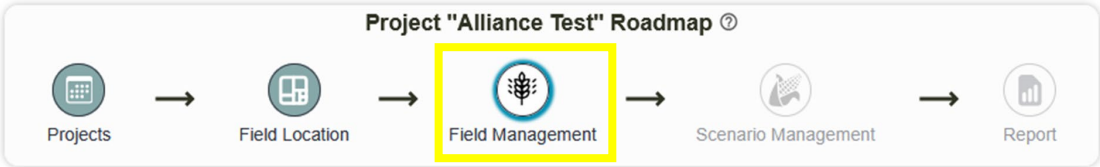
The Crop Rotation Builder allows users to build a crop rotation with pre-defined management data for select dates. Default data includes typical planting dates, harvest dates, irrigation rates, residue removal, and fertilizer application rates and dates appropriate for the field's location. Users may modify or delete any default management from the rotation builder. Using the rotation builder after you have added crop and management details to a baseline or scenario **will result in overwriting the existing rotation** with Rotation Builder defaults.

Crop	Irrigation	Tillage-System Intensity Pre-plant	Tillage-System Intensity Post Harvest	Delete
Select a crop Soybean	*	Select Tillage Intensity Reduced Till (III)	Select Tillage Intensity No Till (III)	
Select a crop Corn	*	Select Tillage Intensity Reduced Till (III)	Select Tillage Intensity No Till (III)	

Cancel

+Add Crop

Save



Field Management – entering crop information



Year	Planted Crop 1 *		Planted Crop 2		Planted Crop 3	
2014	Select a crop... Soybean		Select a crop...		Select a crop...	
2015	Select a crop... Corn		Select a crop...		Select a crop...	
2016	Select a crop... Soybean		Select a crop...		Select a crop...	
2017	Select a crop... Corn		Select a crop...		Select a crop...	
2018	Select a crop... Soybean		Select a crop...		Select a crop...	
	Select a crop...		Select a crop...		Select a crop...	





Define Baseline Management ?

Define **Soybean** Baseline Management in year **2019** for **Soy**.

What if I don't know my exact management details?

√ Planting and Harvest *

√ Tillage System Intensity and Field Operations

√ Fertilizer and/or Organic Amendment Applications

√ Irrigation Events

√ Grazing Events

√ Liming Event



Field Management – pre-populated data



^ Planting and Harvest *

Planting Date ?

Planting Date
05/20/2019



Harvest/Kill Date

Harvest/Kill Date
10/08/2019



Grain/Fruit/Seed/Root/Tuber? ?



Dry Matter Removal

0 %

Yield¹

42

bu/ac



+ Add Harvest Event



Project "Alliance Test" Roadmap ?



Projects



Field Location



Field Management



Scenario Management



Report

Field Management – pre-populated data



^ Planting and Harvest *

Planting Date ?

Planting Date
05/20/2019



Harvest/Kill Date

Harvest/Kill Date
10/08/2019



Grain/Fruit/Seed/Root/Tuber? ?



Dry Matter Removal

0 %

Yield¹

bu/ac



+ Add Harvest Event



While pre-populate data based on county-averages can be useful, field-specific data reduces uncertainty

Project "Alliance Test" Roadmap ?



Projects



Field Location



Field Management



Scenario Management



Report

Field Management – pre-populated data



^ Planting and Harvest *

Planting Date ?

Planting Date
05/20/2019



Harvest/Kill Date

Harvest/Kill Date
10/08/2019



Grain/Fruit/Seed/Root/Tuber? ?



Dry Matter Removal

0 %

Yield¹

bu/ac



Project suggestion: use typical field-scale data for each farm

+ Add Harvest Event



Project "Alliance Test" Roadmap ?



Projects



Field Location



Field Management



Scenario Management



Report



Define Baseline Management ?

Define **Soybean** Baseline Management in year **2019** for **Soy**.

What if I don't know my exact management details?

√ Planting and Harvest *

√ Tillage System Intensity and Field Operations

√ Fertilizer and/or Organic Amendment Applications

√ Irrigation Events

√ Grazing Events

√ Liming Event



Field Management – field specific inputs



Year	Planted Crop 1*	Planted Crop 2	Planted Crop 3
------	-----------------	----------------	----------------

Copy year's management ?

If you would like to copy management details for all crops planted in a single year to another year/field for the Baseline scenario, select the other years and fields in the table below. Copying management to another field/year where management is already entered will overwrite the existing management. Copied management cannot be undone, but users may make changes to management following the copy.

- ☒ year to be copied
- ☐ year has data

Field Location	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Soy		☐	☒	☐	☐	☐	☐	☐	☐	☐	☐

Select a crop...



Project "Alliance Test" Roadmap [?]



Projects



Field Location



Field Management



Scenario Management



Report



1 Scenario Management [?]

Add/View/Edit Scenario

✓  Create New Scenario

Project "Alliance Test" Roadmap [?]



Projects



Field Location



Field Management



Scenario Management



Report



2 Select Field [?]

Using the dropdown menu below or the interactive map, select each field to add crops and management.

Select a field

Soy




Data
Incomplete


Data
Complete


Selected



Scenario Management – entering changes in management



3 cover crop Crops & Management: Soy ?



Using the dropdown menu for each year, or using the Crop Rotation Builder, add crops(s) for each year. Then Edit or Add Management for each crop year using the icon to the right of the crop drop down menu.

Crop Rotation Builder

Conservation Practice Advisor ?

Year	Planted Crop 1 *	Planted Crop 2	Planted Crop 3
2025	Select a crop... ▼	Select a crop... ▼	Select a crop... ▼
2026	Select a crop... ▼	Select a crop... ▼	Select a crop... ▼
2027	Select a crop... ▼	Select a crop... ▼	Select a crop... ▼
2028	Select a crop... ▼	Select a crop... ▼	Select a crop... ▼

Scenario Management – entering changes in management



3 cover crop Crops & Management: Soy[?]

Using the dropdown menu for each year, or using the Crop Rotation Builder, add crops(s) for each year. Then Edit or Add Management for each crop year using the icon to the right of the crop drop down menu.

All management information can be imported from baseline information. Be sure to change any management practices that did change because of the new practice from the Alliance project.

2025

2026

2027

2028

Project "Alliance Test" Roadmap[?]



Projects



Field Location



Field Management



Scenario Management



Report



Apply a Conservation Practice to cover crop on Soy [?]

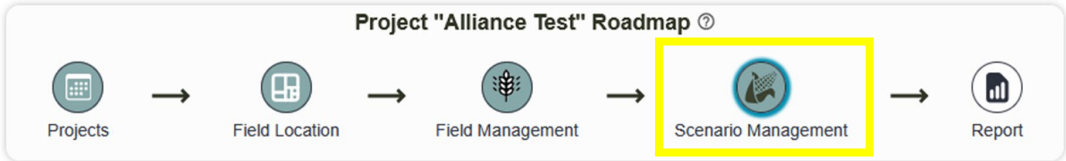
CONSERVATION TILLAGE

☐ Convert to reduced tillage (CPS 345)

- Annual Rye 25% Nitrogen Reduction
- Annual Rye - Legume 37.5% Nitrogen Reduction
- Annual Rye - Legume - Radish 37.5% Nitrogen Reduction
- Austrian Winter Pea 50% Nitrogen Reduction
- Cereal Rye 25% Nitrogen Reduction
- Clover 50% Nitrogen Reduction
- Corn 25% Nitrogen Reduction
- Forage Radish 25% Nitrogen Reduction
- Millet 25% Nitrogen Reduction

FILTER STRIP

☐ Strips & Borders



Scenario Management – pre population of rotation



Year	Planted Crop 1 *		Planted Crop 2		Planted Crop 3	
2024	Select a crop... Corn		Select a crop... Annual Rye (Cover Crop)		Select a crop...	
2025	Select a crop... Soybean		Select a crop... Annual Rye (Cover Crop)		Select a crop...	
2026	Select a crop... Corn		Select a crop... Annual Rye (Cover Crop)		Select a crop...	
2027	Select a crop... Soybean		Select a crop... Annual Rye (Cover Crop)		Select a crop...	
2028	Select a crop... Corn		Select a crop... Annual Rye (Cover Crop)		Select a crop...	
2029	Select a crop... Soybean		Select a crop... Annual Rye (Cover Crop)		Select a crop...	
	Select a crop...		Select a crop...			

Reporting



Project "Alliance Test" Roadmap [?]



Projects



Field Location



Field Management



Scenario Management



Report

Croplands Report Summary

All estimates are summarized in terms of average annual metric tonnes of CO₂-equivalent over the ten-year scenario period. [How are totals, sums, and differences estimated?](#)

☐ Show Uncertainty Report Display:

☒ Dual ☐ Graph ☐ Water Holding Capacity

☐ Emissions Per Acre

View Scenarios

Soy

Source	Baseline	Scenario: cover crop	
	2024 - 2033	2024 - 2033	
	Emissions/Removals	Emissions/Removals	Change
▼ Soy (75 acres - Annual Rye, Soybean, Corn)	15.9	5.4	-10.4
▼ C	-18.8	-23.5	-4.3
Soil	-18.8	-23.5	-4.3
BioChar	0	0	0
▼ CO2	0.9	0.6	-0.3
Liming	0	0	0
Urea Fertilization	0.9	0.6	-0.3
Drained Organic Soils	0	0	0

Croplands Report Summary

All estimates are summarized in terms of average annual greenhouse gas equivalent over the ten-year scenario period. [How are totals, subtotals, and percentages calculated?](#)

☐ Show Uncertainty Report Display:

☒ Dual ☐ Graph ☐ Water Holding Capacity

Emissions before BMP

Emissions after BMP

Difference in emissions

[View Scenarios](#)

Soy

Source	Baseline	Scenario: cover crop	
	2024 - 2033	2024 - 2033	
	Emissions/Removals	Emissions/Removals	Change
▼ Soy (75 acres - Annual Rye, Soybean, Corn)	15.9	5.4	-10.4
▼ C	-18.8	-23.5	-4.3
Soil	-18.8	-23.5	-4.3
BioChar	0	0	0
▼ CO2	0.9	0.6	-0.3
Liming	0	0	0
Urea Fertilization	0.9	0.6	-0.3
Drained Organic Soils	0	0	0

Croplands Report Summary

All estimates are summarized in terms of average annual metric tonnes of CO₂-equivalent over the ten-year scenario period. [How are totals, sums, and differences estimated?](#)

☐ Show Uncertainty Report Display:

☒ Dual ☐ Graph ☐ Water Holding Capacity

☐ Emissions Per Acre

View Scenarios

Soy

Negative (blue) = reduction in emissions
Positive (red) = increase in emissions

Source	Emissions/Removals	Emissions/Removals	Change
▼ Soy (75 acres - Annual Rye, Soybean, Corn)	15.9	5.4	-10.4
▼ C	-18.8	-23.5	-4.3
Soil	-18.8	-23.5	-4.3
BioChar	0	0	0
▼ CO2	0.9	0.6	-0.3
Liming	0	0	0
Urea Fertilization	0.9	0.6	-0.3
Drained Organic Soils	0	0	0

Croplands Report Summary

All estimates are summarized in terms of average annual metric tonnes of CO₂-equivalent over the ten-year scenario period. [How are totals, sums, and differences estimated?](#)

☐ Show Uncertainty Report Display:

☒ Dual ☐ Graph ☐ Water Holding Capacity

☐ Emissions Per Acre

[View Scenarios](#)

Soy

All results are over a 10 year period. Be sure to divide results by 10!

Source	Emissions/Removals	Emissions/Removals	Change
▼ Soy (75 acres - Annual Rye, Soybean, Corn)	15.9	5.4	-10.4
▼ C	-18.8	-23.5	-4.3
Soil	-18.8	-23.5	-4.3
BioChar	0	0	0
▼ CO2	0.9	0.6	-0.3
Liming	0	0	0
Urea Fertilization	0.9	0.6	-0.3
Drained Organic Soils	0	0	0

Source	Baseline	Scenario: No Till	
	2025 - 2034	2025 - 2034	
	Emissions/Removals	Emissions/Removals	Change
▼ Soy (11 acres - Soybean, Corn)	7.1	2	-5.7
> C	1.7	-1.4	-3.6
> CO2	0.1	0	-0.1
> N2O	4.1	2.4	-1.6
> CH4	0	0	0

For Reporting: Change Column



**Be sure to make the numbers positive
when reporting a reduction!**

	Baseline	Scenario: No Till	
Source	2025 - 2034	2025 - 2034	
	Emissions/Removals	Emissions/Removals	Change
▼ Soy (11 acres - Soybean, Corn)	7.1	2	-5.7
> C	1.7	-1.4	-3.6
> CO2	0.1	0	-0.1
> N2O	4.1	2.4	-1.6
> CH4	0	0	0

Please list each FSA Farm#, on it's own individual line. Please do not list multiple Farm numbers in one box. Please include every Farm# that was enrolled in the program.

[illegible]

		Baseline	Scenario: No Till	
Source		2025 - 2034	2025 - 2034	
		Emissions/Removals	Emissions/Removals	Change
▼	Soy (11 acres - Soybean, Corn)	7.1	2	-5.7
>	C	1.7	-1.4	-3.6
>	CO2	0.1	0	-0.1
>	N2O	4.1	2.4	-1.6
>	CH4	0	0	0

Please list each FSA Farm#, on it's own individual line. Please do not list multiple Farm numbers in one box. Please include every Farm# that was enrolled in the program.

[illegible]

	Baseline	Scenario: No Till	
Source	2025 - 2034	2025 - 2034	
	Emissions/Removals	Emissions/Removals	Change
▼ Soy (11 acres - Soybean, Corn)	7.1	2	-5.7
> C	1.7	-1.4	-3.6
> CO2	0.1	0	-0.1
> N2O	4.1	2.4	-1.6
> CH4	0	0	0

Please list each FSA Farm#, on it's own individual line. Please do not list multiple Farm numbers in one box. Please include every farm# that was enrolled in the program.

	FSA Farm#	State	Conservation Practice	County	GHG Reduction	CO2 Reduction	CH4 Reduction	N2O Reduction

COMET Farm Modeling Tool Version Number

**Add CO₂, CH₄, N₂O to get total.
Do NOT use the total on COMET-Farm
(the does not match project guidelines).**

	Baseline	Scenario: No Till	
Source	2025 - 2034	2025 - 2034	
	Emissions/Removals	Emissions/Removals	Change
▼ Soy (11 acres - Soybean, Corn)	7.1	2	X
> C	1.7	-1.4	-3.6
> CO2	0.1	0	-0.1
> N2O	4.1	2.4	-1.6
> CH4	0	0	0

Please list each FSA Farm#, on it's own individual line. Please do not list multiple Farm numbers in one box. Please include every farm# that was enrolled in the program.

	FSA Farm#	State	Conservation Practice	County	GHG Reduction	CO2 Reduction	CH4 Reduction	N2O Reduction

**Add CO₂, CH₄, N₂O to get total.
Do NOT use the total on COMET-Farm
(the does not match project guidelines).**



- We are reporting reductions
 - Blue (negative) in COMET-Farm means reduction: report as positive
 - Red (positive) in COMET-Farm means emissions: report as negative
- Add CO₂, CH₄, and N₂O together to get total reductions
- Reductions are reported on a 10-year scale: we want annual, so divide by 10 on all numbers before reporting

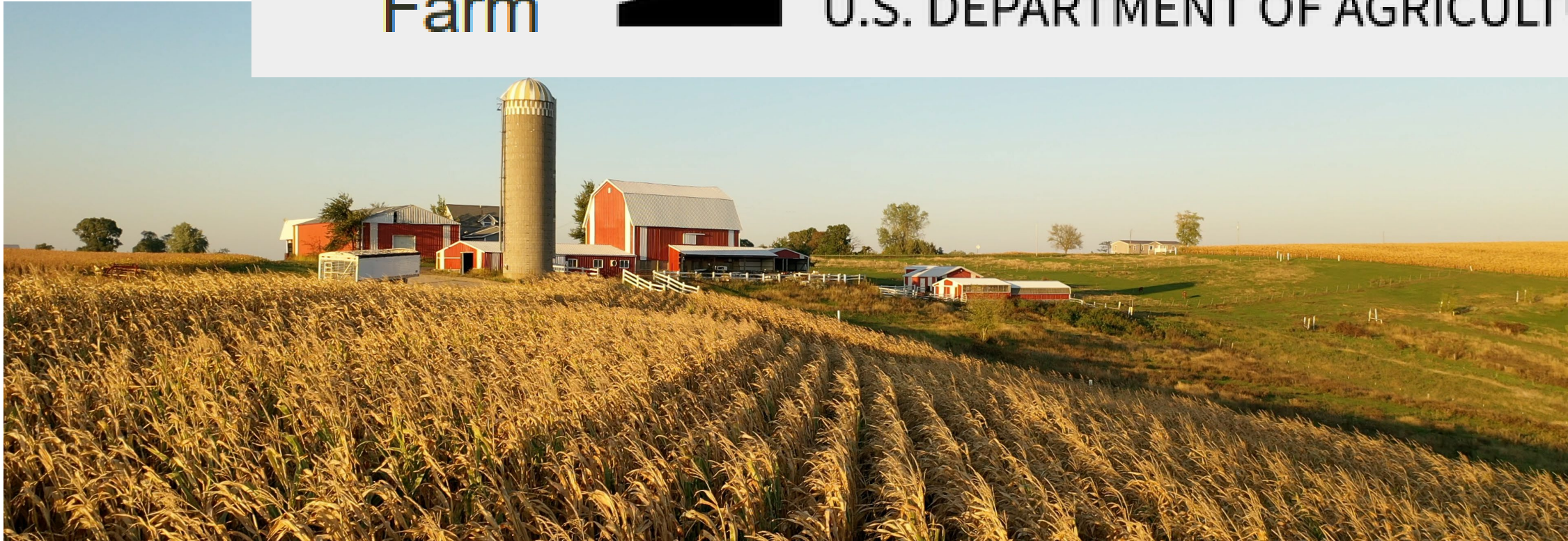
Questions?



COMET
Farm



Natural Resources Conservation Service
U.S. DEPARTMENT OF AGRICULTURE





- Other Recorded Trainings for COMET-Farm
 - Agroforestry (Silvopasture)
 - Animal Agriculture (Prescribed Grazing and Feed Management)
- Email me: afrankl@houstoneng.com