

Resource Assessment Tools: COMET-Farm and Planner

**Soil Health Stewardship
Session #7
Resource Assessment
Tools
September 9, 2021
9:45 to 10:30 pm Eastern**

Speaker

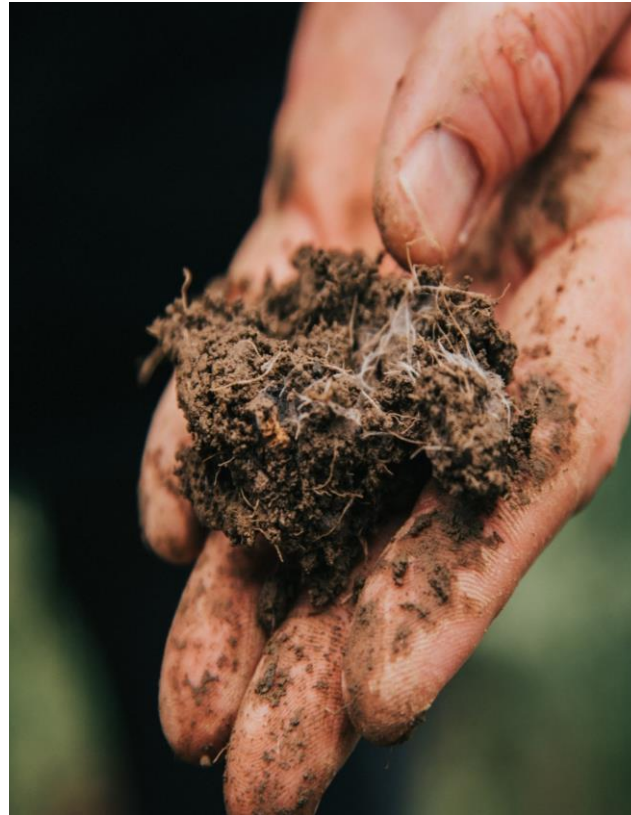
Aaron Ristow

New York Agricultural Stewardship Program Manager

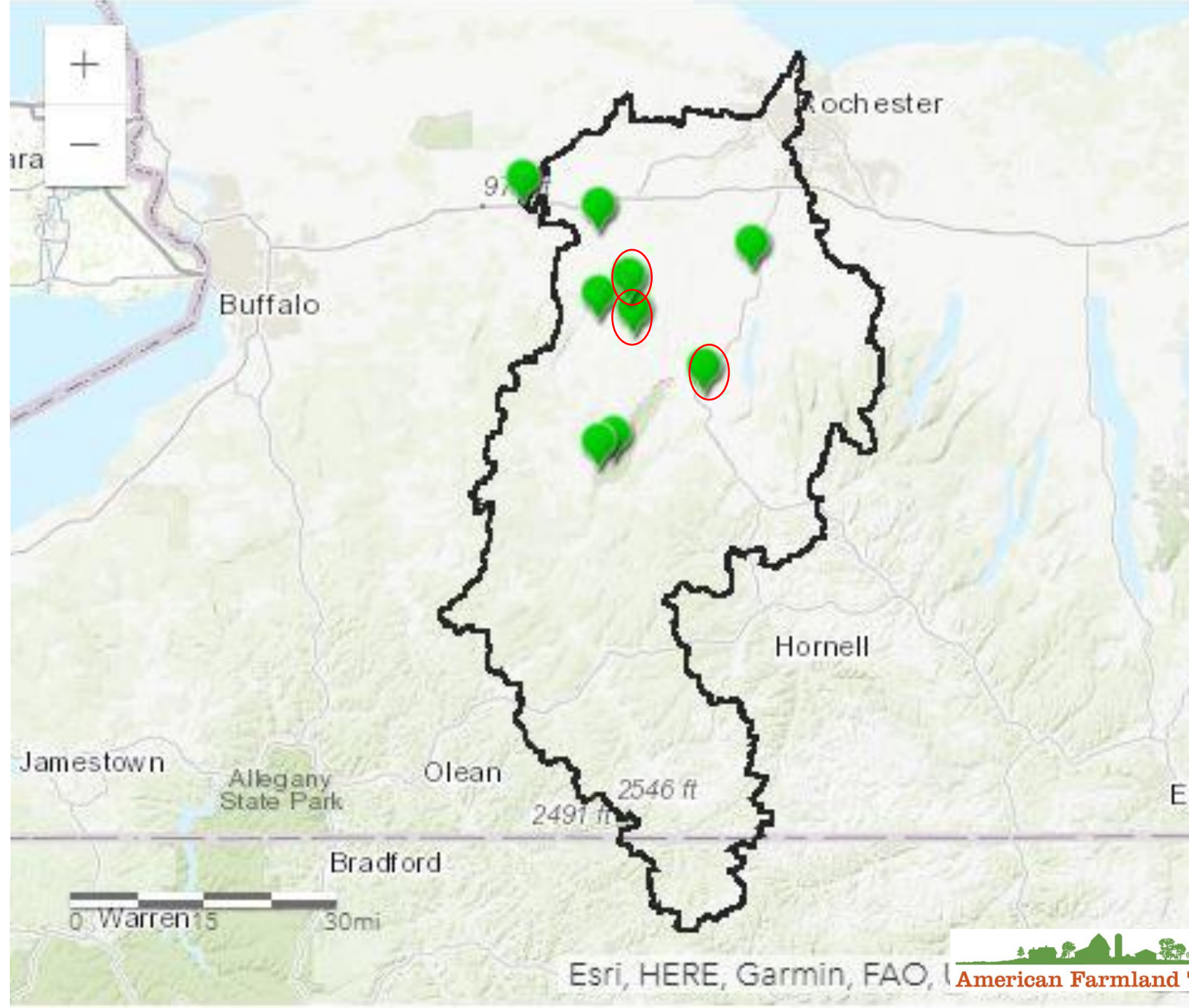
Genesee River Watershed Demonstration Farm Network



- Learn from local farmers with successful soil health implementation
- Learn about changes in economic benefits and costs from their real-life experiences
- Learn about observed changes in soil quality like erosion or water runoff
- Learn how to integrate into current system
- Share technology, information and lessons learned with stakeholders



Genesee River Demo Farm Network





9 AFT-NRCS SOIL HEALTH ECONOMIC & ENVIRONMENTAL CASE STUDIES

9 Soil Health Case Studies

front

2 CA almond



Soil Health Case Study

Ralf Sauter, Okuy Farms, CA

Introduction

Ralf Sauter and his family grow almonds on 140 acres of flat, sandy land and in Northern California. The land has been in the family for over 100 years and is protected from development by a conservation easement. Ralf and his family have been growing almonds for over 100 years and have been successful in maintaining the land for future generations. Ralf and his family have been successful in maintaining the land for future generations.

Soil Health, Economic, Water Quality, and Climate Benefits

In the 10 years since Ralf took over the orchard, he has implemented a series of practices that have improved the soil health, economic, water quality, and climate benefits of the orchard. Ralf has implemented a series of practices that have improved the soil health, economic, water quality, and climate benefits of the orchard.

USDA

American Farmland Trust

2 IL corn-soybeans



Soil Health Case Study

Larry, Adam, and Beth Thorndyke, Thorndyke Farms, IL

Introduction

Larry Thorndyke started growing crops over 40 years ago in the middle of the Upper Midwest. He and his family have been successful in maintaining the land for future generations. Larry and his family have been successful in maintaining the land for future generations.

Soil Health, Economic, Water Quality, and Climate Benefits

Larry and his family have implemented a series of practices that have improved the soil health, economic, water quality, and climate benefits of the orchard. Larry and his family have implemented a series of practices that have improved the soil health, economic, water quality, and climate benefits of the orchard.

USDA

American Farmland Trust

2 OH corn-soybeans



Soil Health Case Study

Eric Niemeyer, MadMax Farms, OH

Introduction

Eric Niemeyer and his family have been growing crops for over 40 years in the middle of the Upper Midwest. Eric and his family have been successful in maintaining the land for future generations. Eric and his family have been successful in maintaining the land for future generations.

Soil Health, Economic, Water Quality, and Climate Benefits

Eric and his family have implemented a series of practices that have improved the soil health, economic, water quality, and climate benefits of the orchard. Eric and his family have implemented a series of practices that have improved the soil health, economic, water quality, and climate benefits of the orchard.

USDA

American Farmland Trust

3 NY diversified row crop systems



Soil Health Case Study

Jay Swede, Gary Swede Farm LLC, NY

Introduction

Jay Swede and his family have been growing crops for over 40 years in the middle of the Upper Midwest. Jay and his family have been successful in maintaining the land for future generations. Jay and his family have been successful in maintaining the land for future generations.

Soil Health, Economic, Water Quality, and Climate Benefits

Jay and his family have implemented a series of practices that have improved the soil health, economic, water quality, and climate benefits of the orchard. Jay and his family have implemented a series of practices that have improved the soil health, economic, water quality, and climate benefits of the orchard.

USDA

American Farmland Trust



Soil Health Case Study

Steve Gould, Har-Go Farms, NY

Introduction

Steve Gould and his family have been growing crops for over 40 years in the middle of the Upper Midwest. Steve and his family have been successful in maintaining the land for future generations. Steve and his family have been successful in maintaining the land for future generations.

Soil Health, Economic, Water Quality, and Climate Benefits

Steve and his family have implemented a series of practices that have improved the soil health, economic, water quality, and climate benefits of the orchard. Steve and his family have implemented a series of practices that have improved the soil health, economic, water quality, and climate benefits of the orchard.

USDA

American Farmland Trust



Soil Health Case Study

Tom and Dan Rogers, CA

Introduction

Tom and Dan Rogers have been growing almonds for over 40 years in the middle of the Upper Midwest. Tom and Dan Rogers have been successful in maintaining the land for future generations. Tom and Dan Rogers have been successful in maintaining the land for future generations.

Soil Health, Economic, Water Quality, and Climate Benefits

Tom and Dan Rogers have implemented a series of practices that have improved the soil health, economic, water quality, and climate benefits of the orchard. Tom and Dan Rogers have implemented a series of practices that have improved the soil health, economic, water quality, and climate benefits of the orchard.

USDA

American Farmland Trust



Soil Health Case Study

Jim, Julie, and Josh Ifft, Ifft Yorkshires, IL

Introduction

Jim Ifft and his family have been growing crops for over 40 years in the middle of the Upper Midwest. Jim and his family have been successful in maintaining the land for future generations. Jim and his family have been successful in maintaining the land for future generations.

Soil Health, Economic, Water Quality, and Climate Benefits

Jim and his family have implemented a series of practices that have improved the soil health, economic, water quality, and climate benefits of the orchard. Jim and his family have implemented a series of practices that have improved the soil health, economic, water quality, and climate benefits of the orchard.

USDA

American Farmland Trust



Soil Health Case Study

Dan Lane, Homewood Farms, OH

Introduction

Dan Lane and his family have been growing crops for over 40 years in the middle of the Upper Midwest. Dan and his family have been successful in maintaining the land for future generations. Dan and his family have been successful in maintaining the land for future generations.

Soil Health, Economic, Water Quality, and Climate Benefits

Dan and his family have implemented a series of practices that have improved the soil health, economic, water quality, and climate benefits of the orchard. Dan and his family have implemented a series of practices that have improved the soil health, economic, water quality, and climate benefits of the orchard.

USDA

American Farmland Trust



Soil Health Case Study

John and Jim Macauley, Macauley Farms LLC, NY

Introduction

John and Jim Macauley have been growing crops for over 40 years in the middle of the Upper Midwest. John and Jim Macauley have been successful in maintaining the land for future generations. John and Jim Macauley have been successful in maintaining the land for future generations.

Soil Health, Economic, Water Quality, and Climate Benefits

John and Jim Macauley have implemented a series of practices that have improved the soil health, economic, water quality, and climate benefits of the orchard. John and Jim Macauley have implemented a series of practices that have improved the soil health, economic, water quality, and climate benefits of the orchard.

USDA

American Farmland Trust

3 NY diversified row crop systems

3 NY diversified row crop systems

Steve Gould, HaR-Go Farms, NY

[illegible]

Positive Effects					Negative Effects				
Increased Income					Increased Expenses				
Item	PER ADR	ADR1	ADR2	ADR3	Item	PER ADR	ADR1	ADR2	ADR3
Net Income	1,000	1,000	1,000	1,000	Net Expense	1,000	1,000	1,000	1,000
Start of Month					Total Demand Income				
Decrease in Cost					Decrease in Loss				
Item	PER ADR	ADR1	ADR2	ADR3	Item	PER ADR	ADR1	ADR2	ADR3
Net Cost	1,000	1,000	1,000	1,000	Net Loss	1,000	1,000	1,000	1,000
Start of Month					Total Demand Loss				
Increased Revenue					Increased Profit				
Item	PER ADR	ADR1	ADR2	ADR3	Item	PER ADR	ADR1	ADR2	ADR3
Net Revenue	1,000	1,000	1,000	1,000	Net Profit	1,000	1,000	1,000	1,000
Start of Month					Total Demand Profit				
Increased Net Income					Increased Net Profit				
Item	PER ADR	ADR1	ADR2	ADR3	Item	PER ADR	ADR1	ADR2	ADR3
Net Income	1,000	1,000	1,000	1,000	Net Profit	1,000	1,000	1,000	1,000
Start of Month					Total Demand Profit				
Increased Net Profit					Increased Net Income				
Item	PER ADR	ADR1	ADR2	ADR3	Item	PER ADR	ADR1	ADR2	ADR3
Net Profit	1,000	1,000	1,000	1,000	Net Income	1,000	1,000	1,000	1,000
Start of Month					Total Demand Profit				
Annual Net Income: \$1,000					Annual Net Profit: \$1,000				
Total Net Income in This Study Area: \$100					Total Net Profit in This Study Area: \$100				
Annual Net Income Per ADR: \$100					Annual Net Profit Per ADR: \$100				
Annual Changes in Total Net Income: \$1,000									
Annual Changes in Per ADR Net Income: \$100									
Return on Investment: 10%									

[illegible]

For more information about this study or to discuss soil health practices, please contact

A photograph showing two individuals, one wearing a plaid shirt and orange gloves, and the other wearing a blue hoodie and a cap, examining a large fish in a body of water. The fish is held by the person in the plaid shirt, and the person in the blue hoodie is looking at it. The background is a body of water with ripples.

ENVIRONMENTAL ANALYSIS

Nutrient Tracking Tool – Water Quality

The screenshot shows a web browser window with the URL <https://ntt.tiaer.tarleton.edu/welcomes/new?locale=en>. The page title is "NTT - Nutrient Tracking Tool (Version 20-2)".

Welcome

Welcome to the Nutrient Tracking Tool (NTT) – a tool to estimate nutrient and sediment losses from crop and pasture. NTT was developed by the Texas Institute for Applied Environmental Research (TIAER) at Tarleton State University with funding and technical support from USDA's Office of Environmental Markets.

Sign in

Email

Password

[Sign in](#) [New User](#)

[Forgot Password?](#)

Nutrient Tracking Tool (Version 20-2)

Logos for Texas Institute for Applied Environmental Research and USDA United States Department of Agriculture are displayed.

Navigation Links:

- About NTT
- What's New
- Presentations
- Contact Us

Related Tools

[Page Instructions](#) [Documentation](#) [Validation](#) [Help](#) [FAQ](#) [Contact Us](#)

The Windows taskbar at the bottom shows the search bar and various application icons. The system clock indicates 5:08 PM on 7/22/2020.

COMET-Farm Tool – GHGs

COMET
Farm



United States Department of Agriculture
Natural Resources Conservation Service



Whole Farm and Ranch
Carbon and Greenhouse Gas
Accounting System.

(Sign in or Register)



HOME TOOL INFO HELP

What is COMET-Farm?

COMET-Farm is a whole farm and ranch carbon and greenhouse gas accounting system.

The tool guides you through describing your farm and ranch management practices including alternative future management scenarios. Once complete, a report is generated comparing the carbon changes and greenhouse gas emissions between your current management practices and future scenarios.

Start Using COMET-Farm



Why should I use
COMET-Farm?



USDA GHG
methods



What information
do I need?



How are my
results calculated?



Is my information
safe?



How do I use
COMET-Farm?



Overview video

Related Tools

Need Help?

Thank you to the External Reviewers of the Case Studies!

■ NRCS Economists

- **Lynn Knight**, Economist, East Region
- **Bryon Kirwan**, Illinois State Economist
- **Lakeitha Ruffin**, Oregon State Economist
- **Richard Iovanna**, FPAC Economist
- **Sophia Glenn**, FPAC Economist
- **Sarah Cline**, FPAC Economist

■ NRCS Soil Health Specialists

- **Zahangir Kabir**, West Regional SH Specialist
- **James Hoorman**, NE Regional SH Specialist
- **Candy Thomas**, NRCS SH Specialist
- **Justin Morris**, NRCS SH Specialist
- **Barry Fisher**, NRCS SH Specialist

■ University Economists

- **John Hanchar**, Cornell Cooperative Extension
- **Gary Schnitkey**, University of Illinois
- **Brent Sohngen**, Ohio State University

■ NTT Reviewer

- **Mindy Selman**, USDA Office of Ecosystem Markets

■ COMET-Farm Reviewers

- **Matthew Stermer, Mark Easter, & Haley Nagle**
Colorado State University

Environmental Benefits of Soil Health Practices Across Three New York Farms

Water Quality Improvement

All 3 row crop farms observed reduced soil and water runoff

On selected field for the 3 NY farms, NTT estimated:

- Weighted average reduction in N losses were **49%** (range was 40 to 70)
- Weighted average reduction in P losses were **80%** (range was 39 to 92)
- Weighted average reduction in sediment losses were **83%** (range was 29 to 99)

Average field size: 16 acres

Range: 10-25 acres

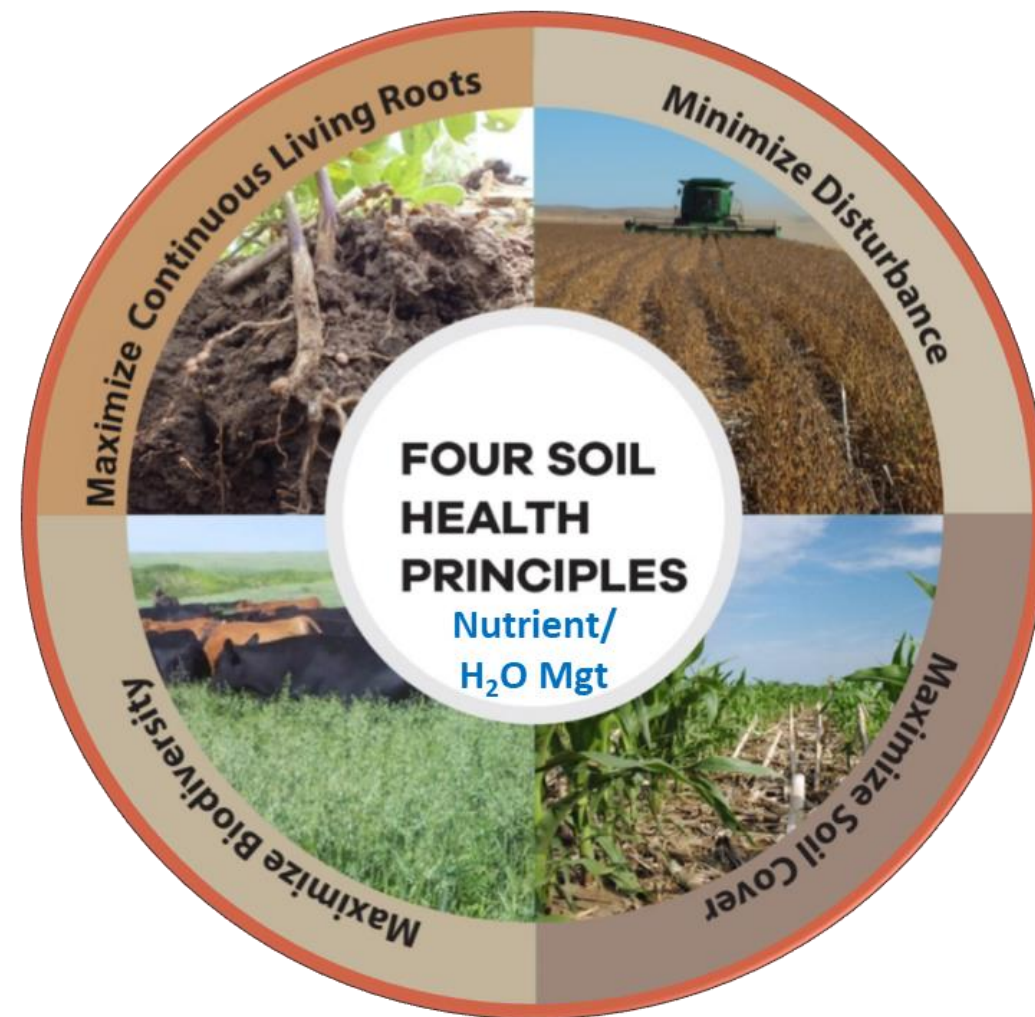
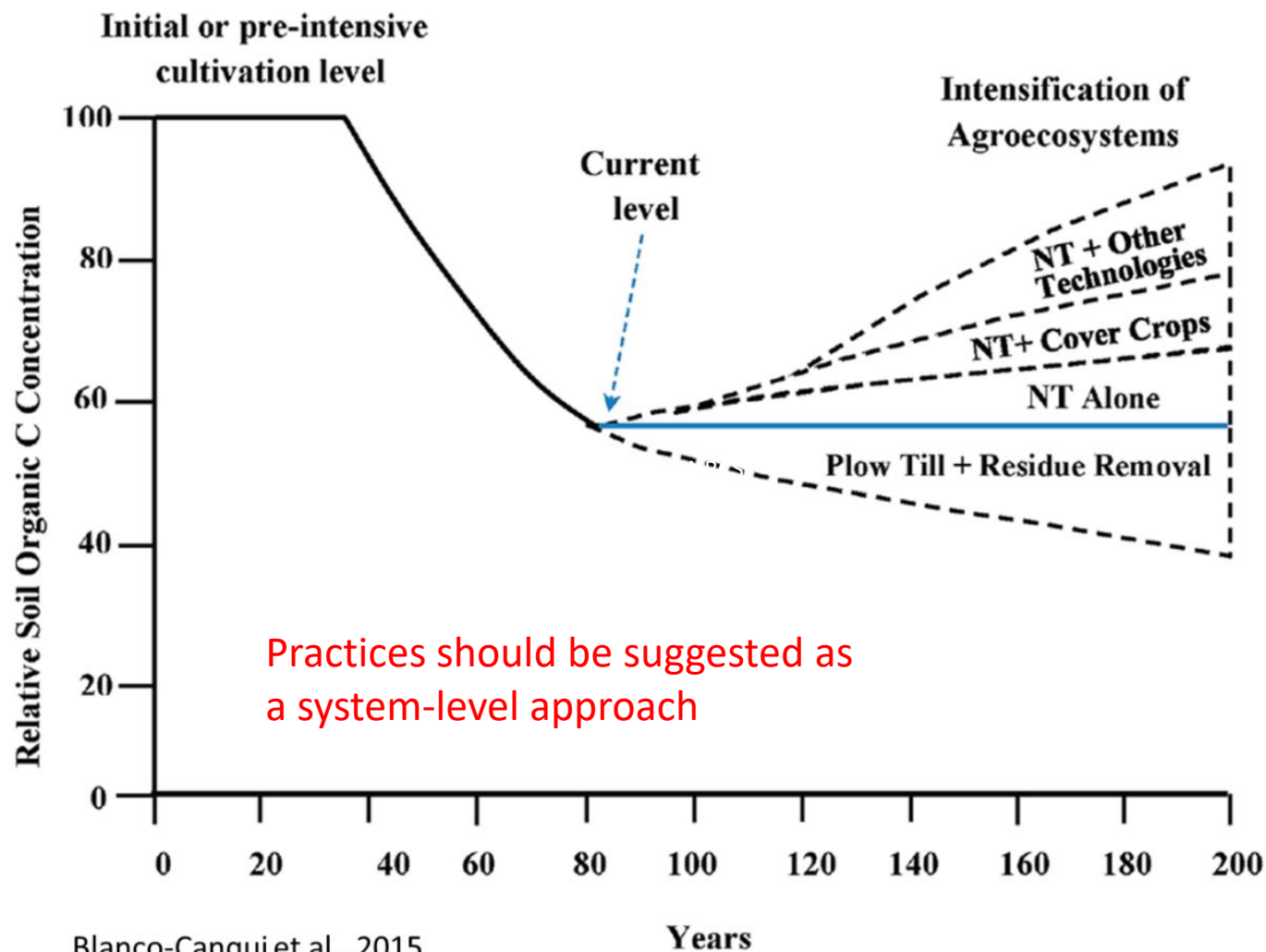
Climate Improvement

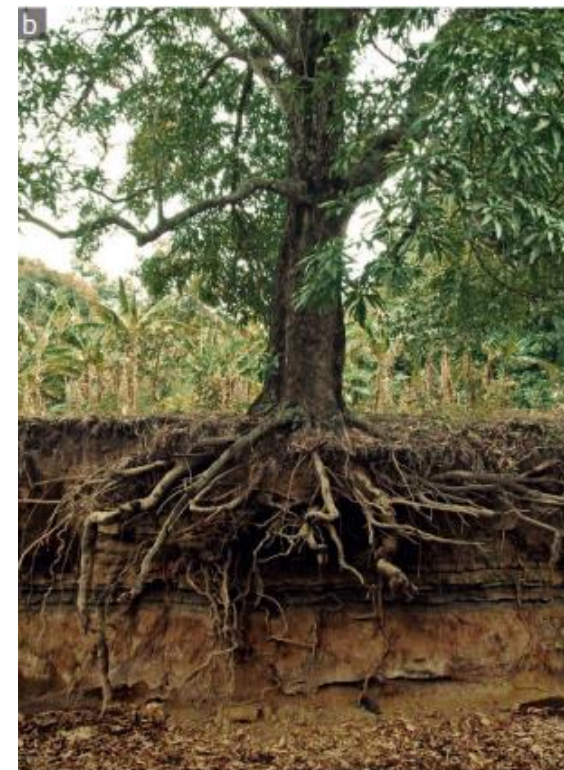
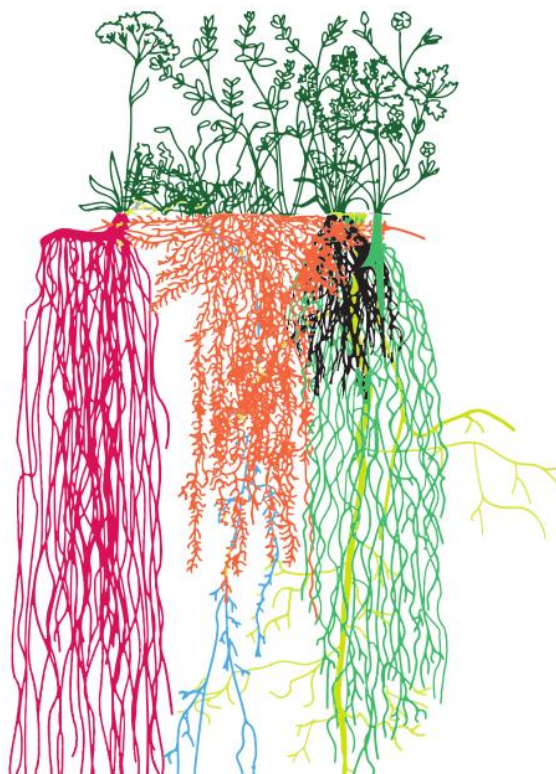
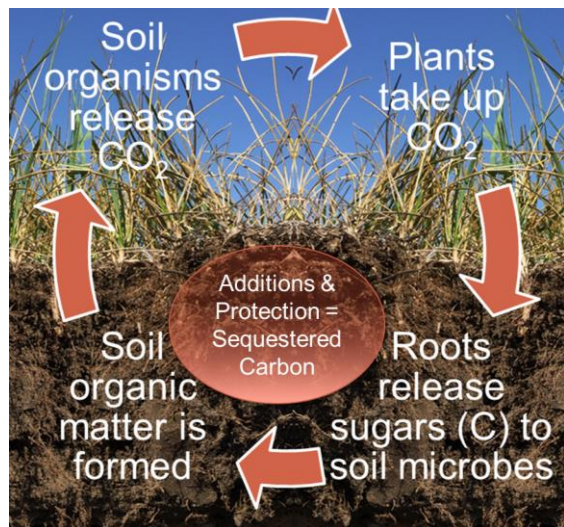
On same selected fields COMET-Farm estimated total GHG emissions

- Weighted average reduction of **366%** (range was 69 to 476)
- Average reduction of **4 cars** off the road annually



Managing for Climate Mitigation & Resiliency: System Synergies





Soil Stores 2-3x More CO₂ than the Atmosphere
2-5x More than Vegetation

Potential Target Areas for GHG Capture

US Adoption of 4 Soil Health Practices

(29 recognized & funded by USDA-NRCS for reducing C emissions)

Practice	Capacity (M ac)	Current Adoption (M ac)	Current Adoption (%)
Prescribed Grazing	655	7	1
Cover Crops	396	15	4
No Till	396	104	26
Nitrogen Management	396	138	35

Source: US Ag. Census (NASS, 2019); ERS (2017)
and the Soil Health Institute



Play Video: COMET Farm & COMET Planner Introduction Presentation

<https://www.youtube.com/watch?v=UHL84S6knYs>

A wide-angle photograph of a lush green field filled with various plants, including several bright yellow flowers. The field extends to a distant treeline under a grey, overcast sky. The text 'COMET Planner Demonstration' is overlaid in the center in a large, white, sans-serif font.

COMET Planner Demonstration

Available at: <https://www.youtube.com/watch?v=sC63SJJ3LRM>

COMET-Farm vs. COMET-Planner

<div>COMET Farm</div> <div>USDA United States Department of Agriculture Natural Resources Conservation Service</div> <div>Colorado State University</div> <div>COMET Planner</div>		
	COMET- FARM	COMET- PLANNER
ANALYSIS LEVEL	Detailed, field specific analysis	Regional average estimates tied to conservation practice adoption
BASELINE SCENARIOS	Flexible	Fixed
TIME FOR RESULTS	Varies on project size	4-clicks to generate estimate
API ACCESSIBILITY	✓	✓

COMET-Planner

Key Information

Step 1: Project Name and Location

- Project name, state, county

Step 2: Farming System and associated Conservation Practices

- Cropland Management
- Grazing Lands
- Wood Plantings
- Cropland to Herbaceous Cover
- Restoration of Disturbed Lands

Step 3: Select NRCS Practices and Implementation

- Several Practice Standards, depending on system
- Several Implementation levels of practices, depending on system

Step 4: Acreage Associated with Each Conservation Practice

Results are instant and displayed at bottom of page



COMET-Planner Results

- All estimates are presented as emission reductions relative to baseline management
- Positive values denote a decrease in GHG emissions and negative values denote an increase in GHG emissions
- Soil and biomass carbon stock increases in response to conservation practices are limited in duration
- The carbon dioxide reductions reported should be viewed as average values over a 20-year duration

The greenhouse gas equivalencies calculator can help you understand what reducing carbon dioxide (CO₂) emissions means in everyday terms:

<https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>

COMET-Planner Carbon Sequestration and Greenhouse Gas Estimation Report

Project Name: Swede Farm

State: New York

County: Livingston

Date Created: 09/08/2021 14:35:06

Approximate Carbon Sequestration and Greenhouse Gas Emission Reductions* (tonnes CO₂ equivalent per year)

NRCS Conservation Practices	Acres	Carbon Dioxide	Nitrous Oxide	Methane	Total CO ₂ -Equivalent
Residue and Tillage Management - No-Till (CPS 329) - Intensive Till to No Till or Strip Till on Non-Irrigated Cropland	25	9	1	0	10
Cover Crop (CPS 340) - Add Non-Legume Seasonal Cover Crop (with 25% Fertilizer N Reduction) to Non-Irrigated Cropland	25	3	0	0	3
Nutrient Management (CPS 590) - Improved N Fertilizer Management on Non-Irrigated Croplands - Reduce Fertilizer Application Rate by 15%	25	0	0	0	0
Totals:	75	12	1	0	13

*Negative values indicate a loss of carbon or increased emissions of greenhouse gases

**Values were not estimated due to limited data on reductions of greenhouse gas emissions from this practice

COMET-Farm vs COMET-Planner Results

COMET-Farm Analysis

E GHG Balance Total (tonnes CO ₂ e/yr)				
0	20.2357			
0	13.5601			
0	18.0522	WHEN IN EXCEL, USE THE "CURRENT" MGT SECTION AS THIS REFLECTS THE		
0	-47.6652	DATA YOU OBTAINED & INPUTTED FROM THE INTERVIEWS		
0	5.03942			
0	4.78393			
0	3.02113	Average 2000 to 2003 ("Old values "before SH years	Brown highlights 4 "before" SH y	
0	-4.1762	-2.75338	Get the average total tonnes GHG	
0	-65.2888			
0	-24.3835			
0	-0.37095	From	0.43	cars
0	-16.2424			
0	-20.4791	To	3	cars
0	-3.34402			
0	-12.3492		2.57	additional
0	5.29331			
0	1.12934	Average 2010 to 2013 ("New" values "after" SH years	Green highlights 4 "after SH year	
0	-4.8338	-13.1037	Get the average total tonnes GHG	
0	-104.806			
0	-10.9279	New minus old		
0	-13.894	-10.3503	equals 2 cars off the road	Difference between the two average values
				Link to EPA's Cars Equivalent Calculator:
0	15.01			
0	9.55926	UPDATE 9-30-20: The original reported value was 11.8 metric tonnes which was 2.5 cars		
0	1.2731			
0	37.5628	total % change (2000 to 2003) of (2010 to 2013)		
0	12.1488	4.7591		
0	22.4794			
0	19.1323	% change emmisions for (2010 to 2018)	376% decrease in emissions	
0	29.3195	475.91		
0	-97.9683			

COMET-Planner Report

COMET-Planner Carbon Sequestration and Greenhouse Gas Estimation Report

Project Name: Swede Farm

State: New York

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Totals:	75	12	1	0	13

*Negative values indicate a loss of carbon or increased emissions of greenhouse gases

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For more information on how these estimates were generated, please visit www.comet-planner.com.

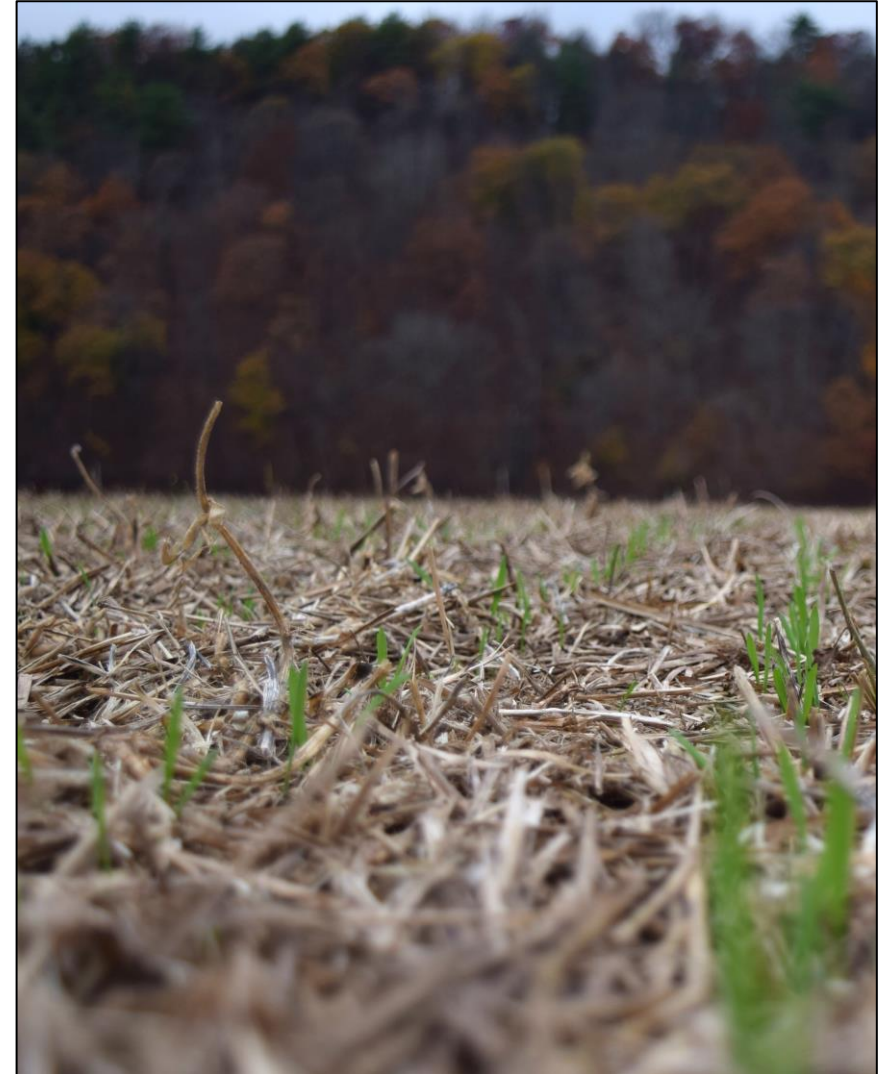


COMET TIPS

TIPS FOR CONDUCTING COMET ANALYSIS

Identifying farmers

- Farmers who have expressed an interest in environmental benefits
- Farmers with a good story/large contrasts between before and after
- Farmers with a history of practice
- Farmers with good records
- Farmer who have other conservation practices in place
- Farmers willing to put their business out there
- Farmers willing to travel and speak about their journey in front of peers
- Farmers respected in their community



TIPS FOR COMET ANALYSIS

Interviewing Farmers

- Schedule visits
- Timing the interview is important; likely only done during winter
- Show interest/be curious
- Identify farm type, practices
- Record interview
- Set aside up to an hour
- Give them an idea of the questions that will be asked before the interview



TIPS FOR CONDUCTING COMET ANALYSIS

Sharing results

- Have a compelling story, seek contrasts
- Must record interview
- Pick out great quotes from your interview
- Make stories as simple as possible
- Have a talented, expert team in place





Contact Info



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aristow@farmland.org
315.748.5029

Download the case studies at:
farmland.org/soilhealthcasestudies