

AFT-NRCS Economic and Environmental Case Studies: Providing Evidence for Soil Health Investment

Speakers

1. Dr. Michelle Perez – AFT Water Initiative Director & Project Leader
2. Florence Swartz – Consulting Economist & former NRCS-NY Economist for Brian Brant, AFT Ag Conservation Innovations Director & Author, Ohio Case Studies
3. Aaron Ristow – AFT NY Stewardship Program Manager & Author, New York Case Studies
4. Ben Wiercinski – AFT Agricultural Economist & Author, Pennsylvania Case Study
5. Sarah Blount – AFT Midwest Conservation Technician & Author, of an Illinois Predictive Assessment

Soil Health Stewardship
Session #4
Soil Health: Basics,
Practices, Benefits, &
Barriers – Part 2
September 8, 2021
1 to 2:45 pm Eastern

Session Objectives

- Familiarize participants with AFT-NRCS Soil Health Economic and Environmental Case Studies, which provide calculated estimates of the
 - costs,
 - benefits, and
 - return on investment (ROI) experienced by “soil health successful farmers,” and
 - estimates of water quality and
 - climate benefits
- Discuss ways these materials can be used with landowners and producers to encourage soil health practice adoption



Agenda

1 – 1:15 pm	Objectives, Findings, Options for Use – Michelle Perez (15 min)
1:15 – 1:25	Ohio Case Studies – Florence Swartz for Brian Brandt (10 min)
1:25 – 1:35	New York Case Studies – Aaron Ristow (10 min)
1:35 – 1:45	Illinois Predictive Assessment – Sarah Blount (10 min)
1:45 – 1:55	Pennsylvania Case Study – Ben Wiercinski (10 min)
1:55 – 2:05	Farmer Guest: Morgan Bond, B & R Farms, PA (10 min)
2:05 to 2:25	Q&A + Discussion (20 min)
2:25 to 2:30	R-SHEC & P-SHEC Tool Kits – Michelle (5 min)
2:30 to 2:40	Online Economic Tool Demo – Flo (10 min)



PROJECT BACKGROUND

Why quantify soil health outcomes?

- Scientific evidence exists that no-till or reduced tillage, cover crops, nutrient management, & conservation crop rotations improve soil health, reduce runoff, lower climate emissions, & sequester carbon
- Not enough information about economic benefits associated with better soil health
- Ag community (growers, landowners, ag retailers, bankers, corporations with sustainability goals, etc.) want to know the “bottom line”



AFT's 2018 USDA Conservation Innovation Grant (CIG) Project Goals



Drive adoption of soil health practices by:

- ✓ Estimating the net economic & environmental benefits associated with adoption of soil health practices by **developing two new economic tools (R-SHEC & P-SHEC) & using available water quality & climate tools (NTT & COMET)**
- ✓ Packaging results in 2-page compelling **case studies**
- ✓ Empowering fellow conservationists to produce their own **case studies** featuring local, “**soil health successful**” producers or **predictive assessments** featuring “**soil health curious**” producers
- ✓ **Theory of change:** The more local evidence there is, the “faster” we get more farmers to “yes” on more acres

Meet the AFT CIG Project Team



Michelle Perez, PhD
Project Leader
Water Initiative Director



Florence Swartz
Project Economist
Retired NRCS NY
Economist

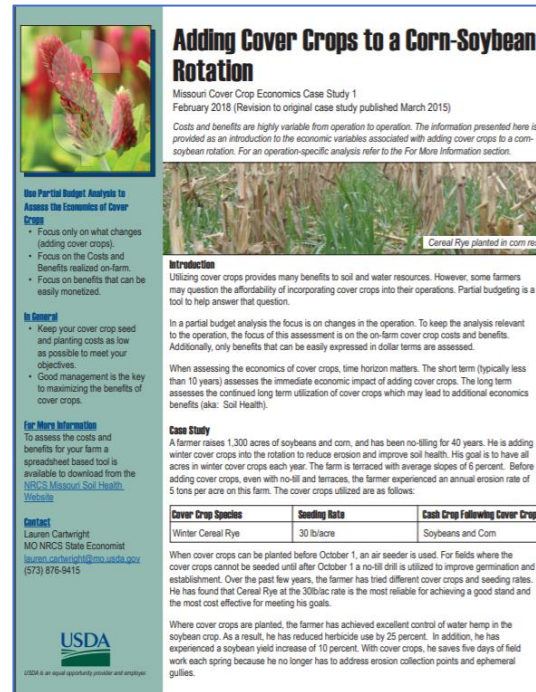


Sat Darshan Khalsa, PhD
AFT Almond Consultant
Assistant Project Scientist
UC Davis

Terrific economic case studies that preceded those by AFT



2 NRCS-NY
2 pages each
Partial Budget Analysis



5 NRCS-MO
2 pages each
Partial Budget Analysis




4 NACD-Datu
16 pages each
Partial Budget Analysis



3 EDF-K-Coe ISOM
4 pages each
Farm Enterprise Analysis

Tailored our case studies after Flo's NRCS-NY case studies



United States
Department of
Agriculture

ECONOMIC C

Farmer Profile: John Kemmerens

Introduction

Angel Rose Dairy is situated in the hills of the town of Bainbridge in Chenango County, New York. In just over two miles from the bank of the Susquehanna River to John Kemmerens' farm, the land gains 500 feet in elevation and continues its rise behind the farm house and barns. The farm's topography is perhaps John's single most influential management factor. The Kemmerens' 300 acres of cropland contains mostly Lord'sburg, Mardin, and Volusia soils. The majority of the cropland has 3 to 15 percent slopes with an average of 25%. When John's father bought the farm in 1968 it was pretty obvious that keeping the ground covered at all times was important for preventing the soil from washing away. They hoped that strip cropping would allow them to farm their steeper land but decided not to try it after seeing their seedlings erode out during moderate rainfall.

As a result, in 1975 prior to development of the availability of Glyphosate, the Kemmerens were among the first farmers in the area to start experimenting with no-till. They bought a no-till drill and tried seeding hay into a strip using 2,4-D six months beforehand and Gramoxone just prior to the seeding with results. Ten years later, they began no-till their corn using a borrowed planter and bought their own no-till planter the following year.

While this change significantly reduced erosion on their steepest ground during the growing season, continued erosion problems after corn harvest prompted the Kemmerens to become early cover crop adopters, first trying it in 1980 through a cover crop seed program offered by the Chenango County Soil and Water Conservation District. The


Angel Rose Dairy Partial Budgeting Analysis

Increases in Net Income				Decreases in Net Income			
Increase in Income				Decrease in Income			
Item	Value	Acres ¹	Total	Item	Value	Acres	Total
Yield Increase, Corn	\$61	100	\$6,100	None identified			
Total Increased Income			\$6,100	Total Decreased Income			\$0
Decrease in Cost				Increase in Cost			
Item	Value	Acres	Total	Item	Value	Acres	Total
Nitrogen Reduction	\$23	100	\$2,300	Cover before Corn	\$95	100	\$9,500
Planting Cost Savings, Corn	\$29	100	\$2,900	Cover before Hay	\$50	50	\$2,500
Planting Cost Savings, Hay	\$74	50	\$3,700				
Reduced Erosion, Corn & Hay ²	\$21	150	\$3,150				
Reduced Nurse Crop Cost, Hay	\$40	50	\$2,000				
Total Decreased Cost			\$14,050	Total Increased Cost			\$12,000
Total Increased Net Income			\$20,150	Total Decreased Net Income			\$12,000
Total Acres Farmed			350	Total Acres Farmed			350
Per Acre Increased Net Income			\$58	Per Acre Decreased Net Income			\$34
Total Net Benefit = \$8,150							
Per Acre Net Benefit = \$24							

Conservation Service

losing houghts

The Kemmerens' focus on soil health and forage production is paid off in many ways. In addition to realizing a 100% return on investment by adopting soil health practices, they have won multiple awards for high quality forage and John has become a sought after speaker at various soil health related events. In addition, John is one of only three recipients to be given the Responsible Farm Management Award at the National No-Till Conference in past January. While all of this recognition is appreciated by John and his family, their goal has always been to get as much from the land as possible by taking care of the soil under their feet. This focus has allowed them to increase their soil's productivity while cutting costs, leading to more sustainable farming both economically and environmentally.



New York
Natural
Resources
Conservation
Service

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October 2018

A photograph of a young boy, a man, and an older man at a farm. The boy is sitting on a concrete fence, wearing a blue t-shirt with red and white stripes and blue jeans. The man is leaning against the fence, wearing a red and blue plaid shirt. The older man is leaning against the fence, wearing a green cap and a light-colored shirt. A cow is in the foreground, partially obscured by the fence. The background shows green trees and a clear sky.

ECONOMIC METHODS

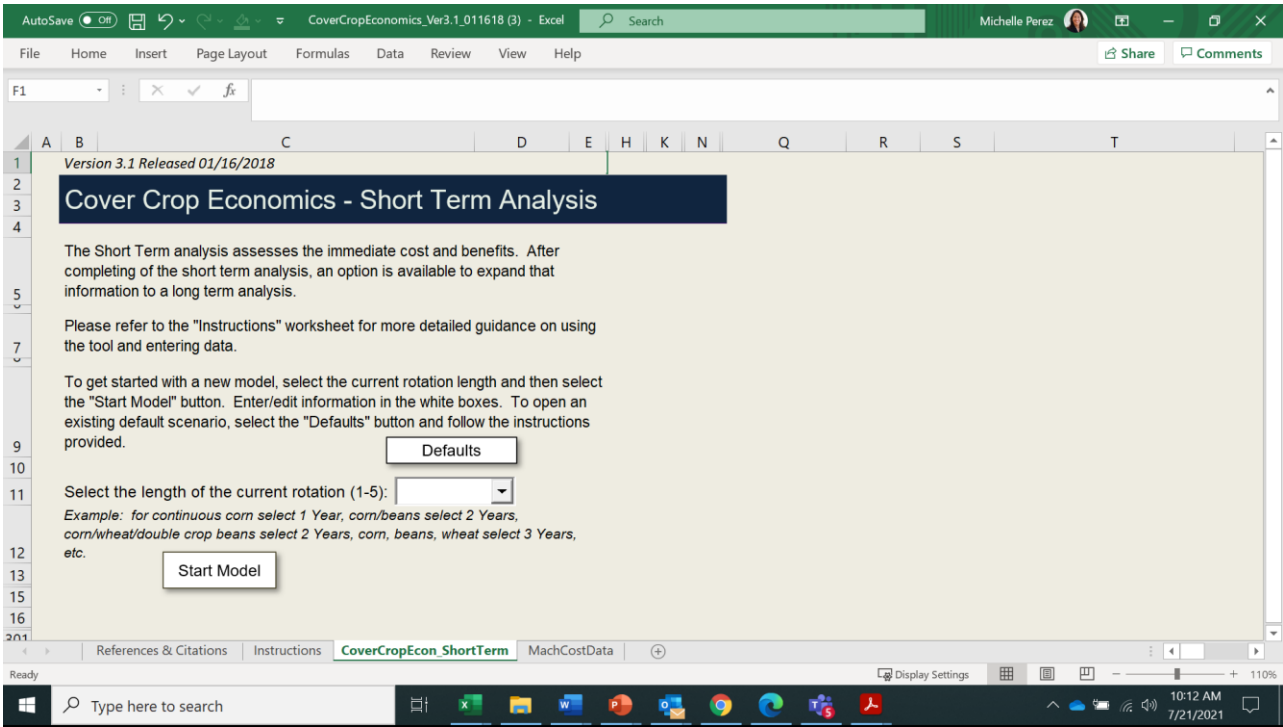
To teach a partial budget analysis, Flo developed a calculator based on the NRCS Cover Crops Tool

Level III T-Chart

T-Chart, Level III, Cropland – Soil Quality Improvement	
Name: Sandy Clayton Location: Columbia Basin, Oregon Date: 2008	Resource Concerns/Benchmark Condition: 600 acres of cropland producing 70 bushels wheat and 50 bushels barley per acre in a two year rotation. Conventional tillage, nutrient and pest management. Resource concerns include: Sheet & Rill Soil Erosion, Organic Matter Depletion, Compaction, Surface Water Contaminants, Plant Productivity, and Wildlife.
Conservation Treatment: Conservation Crop Rotation (Winter Wheat/Canola/Spring Barley) Residue Management (Direct Seed/No-Till) Pest Management (Annual Grasses and Aphids) Nutrient Management (Fertilizer Management)	
Positive Effects	Negative Effects
Reduced Costs <ul style="list-style-type: none">Change in Crop Rotation = \$25/ac/yr2-year Conventional Rotation<ul style="list-style-type: none">Winter Wheat \$100/ac/yrSpring Barley \$50/ac/yr3-year No-Till Rotation<ul style="list-style-type: none">Winter Wheat \$130/ac/yrCanola \$100/ac/yrSpring Barley \$70/ac/yrDecreased fertilizer applied 20 Lbs N/Ac 20 Lbs/Ac * \$.75/Lb / 3 Yrs = \$5/ac/yrReduce six tillage passes over the field: \$10/Pass * 6 Passes / 3 Yrs = \$20/ac/yrReduce fuel and labor (included in the reduced tillage passes)	Increased Costs <ul style="list-style-type: none">No-Till Drill = \$25,000, amortized at 5 Yr. loan, 6% interest, 600 Acres = \$9.90/Ac/Yr. (not included in crop budgets, amortization explained below)Pest Management \$10.10/Ac/Yr.Nutrient/Fertilizer Management = \$2/ac/yr Reduced Revenue <ul style="list-style-type: none">Possible lost grazing opportunities
Increased Revenue <ul style="list-style-type: none">Wheat yield increase (no estimate available)Financial Assistance Payment \$10/ac/yr	
Other <ul style="list-style-type: none">Improved soil and water qualityUpland bird habitat improvement	
Total Dollar Benefits = \$35/ac/yr	Total Dollar Costs = \$22/ac/yr
\$35/ac/yr Total Benefits - \$22/Ac/Yr Total Costs = \$13/ac/yr Net Benefits	

NRCS Cover Crops Decision Support Tool

Developed by Lauren Cartwright, NRCS-MO & Bryon Kirwan, NRCS-IL



[Soil Health | NRCS Missouri \(usda.gov\)](https://www.usda.gov/nrcs/missouri)
(Keywords: NRCS MO cover crop tool)



Partial Budget Analysis Overview

- Partial budget analysis:
 - Estimates the economic effect (benefits and costs) of variables affected by a change in a farming operation
 - For this study, PBA compares costs & benefits “before” & “after” soil health practice implementation
 - Developed a 21-page Questionnaire (Word) & an 11-tab Economic Calculator (Excel) to conduct the PBA
 - Uses national datasets for crop, machinery, fertilizer, etc. prices rather than farmer-specific prices
- Primary effects evaluated:
 1. Machinery
 2. Fertilizer
 3. Pesticide
 4. Yield
 5. Erosion repair
 6. Learning costs
 7. Other

Meet the Authors of the AFT Case Studies



Justin Bodell
CA Stewardship Manager



Paul Lum
CA Project Manager



Aaron Ristow
NY Ag Stewardship
Program Manager



Brian Brandt
Ag Innovations Director, OH



Emily Bruner, PhD
Midwest Science Director, IL

Newest additions to the AFT Case Studies and Predictive Assessment Team



Ellen Yeatman
Reviewing Economist
Water Resources Specialist



Ben Wiercinski
Author of FRPP Case
Studies & Predictive
Assessments
Ag Economist



Sarah Blount
Author of Illinois Predictive Assessment
Midwest Conservation Technician

A photograph showing two individuals, likely researchers or fishermen, examining a large fish. One person, wearing a blue hoodie and a cap, is holding the fish. The other person, wearing a plaid shirt and orange gloves, is pointing at the fish's mouth. The background is a body of water. A semi-transparent dark band across the middle of the image contains the text "METHODS FOR ENVIRONMENTAL ANALYSIS" in white, bold, uppercase letters.

METHODS FOR ENVIRONMENTAL ANALYSIS

Nutrient Tracking Tool – Water Quality

The screenshot displays the Nutrient Tracking Tool (Version 20-2) web application. The browser window shows the URL <https://ntt.tiaer.tarleton.edu/welcomes/new?locale=en>. The application has a dark blue header with the title "NTT - Nutrient Tracking Tool (Version 20-2)". Below this, a "Welcome" section provides an overview of the tool's purpose: to estimate nutrient and sediment losses from crop and pasture, developed by the Texas Institute for Applied Environmental Research (TIAER) at Tarleton State University with funding from USDA's Office of Environmental Markets. A "Sign in" section includes input fields for "Email" and "Password", "Sign in" and "New User" buttons, and a "Forgot Password?" link. To the right of the text is a large image of wheat stalks with the text "Nutrient Tracking Tool (Version 20-2)" overlaid. Below the main content area are four icons with labels: "About NTT", "What's New", "Presentations", and "Contact Us". At the bottom, a "Related Tools" section contains links for "Page Instructions", "Documentation", "Validation", "Help", "FAQ", and "Contact Us". The Windows taskbar at the bottom shows the search bar and various application icons, with the system clock indicating 5:08 PM on 7/22/2020.


COMET-Farm Tool – GHGs

Farm

Natural Resources Conservation Service

USDA Library

Accounting System.




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

[Need Help?](#)

Related Tools

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

Thank you to Bianca Moebius-Clune, NRCS Soil Health Division Director, for putting NRCS' logo on the case studies to increase their use by conservationists with farmers!



Soil Health Case Study

Eric Niemeyer, MadMax Farms, OH

Introduction

Eric Niemeyer's MadMax Farms lies in the middle of the Upper Scioto Watershed in Ohio. Eric is a first-generation farmer in his 15th farming season producing corn and soybeans. He has learned many lessons the hard way by trying different ideas and learning what practices work best on his 1,250-acre operation.

His soils are mainly silt and clay loams. Although many of his fields have flat or slightly rolling terrain, Eric saw the impact of erosion when gullies formed in low areas or where soil washed away in areas of concentrated water flow. More importantly, he recognized that using conventional tillage practices made it difficult to consistently grow a profitable crop.

Consequently, Eric spent time educating himself at workshops, field days, and conferences, and by reading about soil health practices. When Eric decided he needed to change how he farmed, he sought the help of Charlie Walker, his right-hand man and a longtime no-till innovator. Following Charlie's advice, Eric converted his cropland to no-till and adopted variable rate fertilizer application technology (VRT) in 2011. To address surface or sub-surface drainage issues, Eric repaired sub-surface drainage tile, gullies, and eroded areas. He also began taking soil tests every two years instead of every four.

In 2014, he started planting cover crops on his entire farm. Eric prefers using multi-species mixes and customizes them based on whether he is planting corn or soybeans. In addition, he fine-tunes his soybean recipe based on what health outcomes he is trying to achieve. These include breaking up compaction layers, increasing



water infiltration, increasing organic matter, and improving nutrient availability. Eric became such a believer in cover crops that he started a cover crop consulting business in 2014. He also seeds cover crops for other farmers using his customized, high clearance seeder during the growing season. Eric continues educating himself about soil health practices for his farm and for his consulting businesses. Half of Eric's significant learning costs

have been attributed to his farm operation and included in this study.

Soil Health, Economic, Water Quality, and Climate Benefits

Combining cover cropping, no-till, and VRT has produced many benefits. Eric can see and smell the improvements in soil health, which he believes have led in part to increased yields. Since 2014, his per acre yields have gone from 165 to 195 bushels for corn and from 45 to 65 bushels for soybeans. He estimates at least half of these improvements are the result of his soil health management system and attributes the rest to good weather and better varieties.

Better soil health has also led to better nutrient cycling, improved weed management, and less disease and insect pressure. These changes, along with more precise nitrogen (N) applications allowed Eric to cut N for corn by over 5%. More importantly, he has been able to cut phosphorus (P) and potassium applications by 50% for both corn and soybeans. As a result, he is saving almost \$18 per acre each year on fertilizer. Better soil health has allowed Eric to reduce his soybean seeding rate, saving \$5 per acre. Similarly, he has nearly eliminated the need for residual herbicides

JULY 2019

Farm at a Glance

COUNTY: Marion & Delaware Counties, OH

WATERSHED: Upper Scioto Watershed

CROPS: Corn & soybeans

FARM SIZE: 1,250 acres

SOILS: Silt loam & clay loam soils, flat to slightly rolling terrain with slopes from 0 to 10%

SOIL HEALTH PRACTICES: No-till, cover crops, nutrient management



NRCS agreed to co-brand the case studies!



United States Department of Agriculture
Natural Resources Conservation Service



United States Department of Agriculture
Natural Resources Conservation Service





9 AFT-NRCS SOIL HEALTH ECONOMIC & ENVIRONMENTAL CASE STUDIES

9 Soil Health Case Studies (front)

2 CA almond



Soil Health Case Study

Ralf Sauter, Okuyee Farms, CA

Introduction

Ralf Sauter and his family grow almonds on 140 acres of flat, sandy land and in National County, California. The land has been in the family for over 100 years and is protected from development by a conservation easement. Their parent grew up, Ralf took over the operation from his mother in 2006. Now, when he and his wife moved their family from Colorado to the San Joaquin Valley.

John is the president of the Trust. Marned Resources Conservation District also protected the use of cover, erosion, and water management practices. Ralf and his family have been growing almonds for over 100 years. Ralf and his family have been growing almonds for over 100 years. Ralf and his family have been growing almonds for over 100 years.

Soil Health, Economic, Water Quality, and Climate Benefits

In the 10 years since Ralf took over the orchard, he implemented a 20% increase in soil health, which is a combination of organic matter, water infiltration, and soil structure. Ralf and his family have been growing almonds for over 100 years. Ralf and his family have been growing almonds for over 100 years. Ralf and his family have been growing almonds for over 100 years.

USDA

United States Department of Agriculture
National Resource Conservation District

American Farmland Trust

Farm at a Glance

COUNTY: National
CROP: Almonds
ACRES: 140
ESTABLISHED: 1900s
COVER CROPS: None
SOIL HEALTH PRACTICES: None
WATER MANAGEMENT: None
EROSION CONTROL: None
CLIMATE BENEFITS: None

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 wife, Beth, and son, Adam, have been growing crops for over 40 years. They have been growing crops for over 40 years. They have been growing crops for over 40 years.

Soil Health, Economic, Water Quality, and Climate Benefits

Larry and Adam first started in 2011 with cover crops. They have been growing crops for over 40 years. They have been growing crops for over 40 years. They have been growing crops for over 40 years.

USDA

United States Department of Agriculture
National Resource Conservation District

American Farmland Trust

Farm at a Glance

COUNTY: Ford County, IL
CROP: Corn, Soybeans
ACRES: 1,000
ESTABLISHED: 1970s
COVER CROPS: None
SOIL HEALTH PRACTICES: None
WATER MANAGEMENT: None
EROSION CONTROL: None
CLIMATE BENEFITS: None

2 OH corn-soybeans



Soil Health Case Study

Eric Niemeyer, MadMax Farms, OH

Introduction

Eric Niemeyer's MadMax Farms has been in the middle of the Upper Midwest for over 40 years. He and his wife, MadMax, have been growing crops for over 40 years. They have been growing crops for over 40 years. They have been growing crops for over 40 years.

Soil Health, Economic, Water Quality, and Climate Benefits

Eric and MadMax first started in 2011 with cover crops. They have been growing crops for over 40 years. They have been growing crops for over 40 years. They have been growing crops for over 40 years.

USDA

United States Department of Agriculture
National Resource Conservation District

American Farmland Trust

Farm at a Glance

COUNTY: Madison County, OH
CROP: Corn, Soybeans
ACRES: 1,000
ESTABLISHED: 1970s
COVER CROPS: None
SOIL HEALTH PRACTICES: None
WATER MANAGEMENT: None
EROSION CONTROL: None
CLIMATE BENEFITS: None

3 NY diversified row crop systems



Soil Health Case Study

Jay Swede, Gary Swede Farm LLC, NY

Introduction

Jay Swede, his father, John, and his brother, Gary, have been growing crops for over 40 years. They have been growing crops for over 40 years. They have been growing crops for over 40 years.

Soil Health, Economic, Water Quality, and Climate Benefits

Jay and Gary first started in 2011 with cover crops. They have been growing crops for over 40 years. They have been growing crops for over 40 years. They have been growing crops for over 40 years.

USDA

United States Department of Agriculture
National Resource Conservation District

American Farmland Trust

Farm at a Glance

COUNTY: Seneca County, NY
CROP: Corn, Soybeans, Wheat, Alfalfa
ACRES: 1,000
ESTABLISHED: 1970s
COVER CROPS: None
SOIL HEALTH PRACTICES: None
WATER MANAGEMENT: None
EROSION CONTROL: None
CLIMATE BENEFITS: None



Soil Health Case Study

Steve Gould, Har-Go Farms, NY

Introduction

Steve Gould, his father, John, and his brother, Gary, have been growing crops for over 40 years. They have been growing crops for over 40 years. They have been growing crops for over 40 years.

Soil Health, Economic, Water Quality, and Climate Benefits

Steve and Gary first started in 2011 with cover crops. They have been growing crops for over 40 years. They have been growing crops for over 40 years. They have been growing crops for over 40 years.

USDA

United States Department of Agriculture
National Resource Conservation District

American Farmland Trust

Farm at a Glance

COUNTY: Seneca County, NY
CROP: Corn, Soybeans, Wheat, Alfalfa
ACRES: 1,000
ESTABLISHED: 1970s
COVER CROPS: None
SOIL HEALTH PRACTICES: None
WATER MANAGEMENT: None
EROSION CONTROL: None
CLIMATE BENEFITS: None



Soil Health Case Study

Tom and Dan Rogers, CA

Introduction

Tom Rogers and his brother, Dan, have been growing almonds for over 40 years. They have been growing almonds for over 40 years. They have been growing almonds for over 40 years.

Soil Health, Economic, Water Quality, and Climate Benefits

Tom and Dan first started in 2011 with cover crops. They have been growing almonds for over 40 years. They have been growing almonds for over 40 years. They have been growing almonds for over 40 years.

USDA

United States Department of Agriculture
National Resource Conservation District

American Farmland Trust

Farm at a Glance

COUNTY: National
CROP: Almonds
ACRES: 140
ESTABLISHED: 1900s
COVER CROPS: None
SOIL HEALTH PRACTICES: None
WATER MANAGEMENT: None
EROSION CONTROL: None
CLIMATE BENEFITS: None



Soil Health Case Study

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

Introduction

Jim Ifft started farming in 1970 and currently farms with his wife, Julie, and son, Josh. They have been growing crops for over 40 years. They have been growing crops for over 40 years. They have been growing crops for over 40 years.

Soil Health, Economic, Water Quality, and Climate Benefits

Jim and Julie first started in 2011 with cover crops. They have been growing crops for over 40 years. They have been growing crops for over 40 years. They have been growing crops for over 40 years.

USDA

United States Department of Agriculture
National Resource Conservation District

American Farmland Trust

Farm at a Glance

COUNTY: Livingston, IL
CROP: Corn, Soybeans
ACRES: 1,000
ESTABLISHED: 1970s
COVER CROPS: None
SOIL HEALTH PRACTICES: None
WATER MANAGEMENT: None
EROSION CONTROL: None
CLIMATE BENEFITS: None



Soil Health Case Study

Dan Lane, Homewood Farms, OH

Introduction

Dan Lane Homestead Farms has been in the Upper Midwest for over 40 years. He and his wife, Homewood, have been growing crops for over 40 years. They have been growing crops for over 40 years. They have been growing crops for over 40 years.

Soil Health, Economic, Water Quality, and Climate Benefits

Dan and Homewood first started in 2011 with cover crops. They have been growing crops for over 40 years. They have been growing crops for over 40 years. They have been growing crops for over 40 years.

USDA

United States Department of Agriculture
National Resource Conservation District

American Farmland Trust

Farm at a Glance

COUNTY: Madison County, OH
CROP: Corn, Soybeans
ACRES: 1,000
ESTABLISHED: 1970s
COVER CROPS: None
SOIL HEALTH PRACTICES: None
WATER MANAGEMENT: None
EROSION CONTROL: None
CLIMATE BENEFITS: None



Soil Health Case Study

John and Jim Macauley, Macauley Farms LLC, NY

Introduction

John Macauley, his father, Jim, and his brother, Jeff, have been growing crops for over 40 years. They have been growing crops for over 40 years. They have been growing crops for over 40 years.

Soil Health, Economic, Water Quality, and Climate Benefits

John and Jeff first started in 2011 with cover crops. They have been growing crops for over 40 years. They have been growing crops for over 40 years. They have been growing crops for over 40 years.

USDA

United States Department of Agriculture
National Resource Conservation District

American Farmland Trust

Farm at a Glance

COUNTY: Seneca County, NY
CROP: Corn, Soybeans, Wheat, Alfalfa
ACRES: 1,000
ESTABLISHED: 1970s
COVER CROPS: None
SOIL HEALTH PRACTICES: None
WATER MANAGEMENT: None
EROSION CONTROL: None
CLIMATE BENEFITS: None

IL corn-soybeans 2 OH corn-soybeans

3 NY diversified row crop systems

2 IL corn-soybeans

3 NY diversified row crop systems

Steve Gould, HaR-Go Farms, NY

\$11 per acre per year or by \$4,780 annually on the 450-acre study area, achieving an

The Goodfellowized two tillage passes by switching to no-till for hay establishment, saving over \$10 per acre annually and \$6 per acre each year since they no longer need to plow rocks. The use of no-till and cover crops also decreased sheet and soil erosion by 0.8 tons per acre per year, worth about \$646 per acre per year based on the value of soil and water conservation. Running off? Soil loss was minimal to begin with, because the hay provides perennial cover for three years.

While incurring annual costs from planting cover crops (\$906/60 acres), the farm is increasing their forage (about \$180 per acre) and getting less loss from erosion. Invest count? The \$260 per acre per year for injecting manure on 270 acres of hay and

The Goodfellow family has been able to optimize land use for cover crops and reduce erosion in barn workshops, with his crew.

The USDA's NRCS was used to take advantage of the benefits on the study site. A full-time management consultant, Russ and Linda, are 29%, and Farm Tool is 71% health care.

Positive Effects					Negative Effects				
Increase in income					Decrease in income				
Costs	Net income	Net income	Net income	Total	Costs	Net income	Net income	Net income	Total
Fixed value of remaining inventory	1,000	0	0	1,000	None	0	0	0	0
Variable value of remaining inventory	1,000	0	0	1,000	None	0	0	0	0
Costs					Costs				
Decrease in Cost					Decrease in Cost				
Costs	Net income	Net income	Net income	Total	Costs	Net income	Net income	Net income	Total
Cost of inventory	10,000	0	0	10,000	Cost of inventory	10,000	0	0	10,000
Cost of handling	10,000	0	0	10,000	Cost of handling	10,000	0	0	10,000
Cost of storage	10,000	0	0	10,000	Cost of storage	10,000	0	0	10,000
Cost of insurance	10,000	0	0	10,000	Cost of insurance	10,000	0	0	10,000
Cost of depreciation	10,000	0	0	10,000	Cost of depreciation	10,000	0	0	10,000
Cost of maintenance	10,000	0	0	10,000	Cost of maintenance	10,000	0	0	10,000
Cost of repair	10,000	0	0	10,000	Cost of repair	10,000	0	0	10,000
Cost of replacement	10,000	0	0	10,000	Cost of replacement	10,000	0	0	10,000
Cost of disposal	10,000	0	0	10,000	Cost of disposal	10,000	0	0	10,000
Cost of liquidation	10,000	0	0	10,000	Cost of liquidation	10,000	0	0	10,000
Cost of sale	10,000	0	0	10,000	Cost of sale	10,000	0	0	10,000
Cost of interest	10,000	0	0	10,000	Cost of interest	10,000	0	0	10,000
Cost of taxes	10,000	0	0	10,000	Cost of taxes	10,000	0	0	10,000
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Cost of gross	10,000	0	0	10,000	Cost of gross	10,000	0	0	10,000
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small-scale research units that measure the environmental performance of individual firms and their products, services, and processes. The study also includes a detailed analysis of the environmental performance of the world's largest corporations, as well as a detailed analysis of the environmental performance of the world's largest corporations, as well as a detailed analysis of the environmental performance of the world's largest corporations.

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

- Aaron Ristow, American Farmland Trust, New York Agricultural Stewardship Program Manager, aristow@farmlandtrust.org, 315-748-5050
- USDA NRCS Grassland Ecosystem Office, 29 Liberty Street, Suite 1, Batavia, NY 14020, 585-343-2363

To read more about this study, visit farmlandtrust.org/soilhealth

100%

An aerial photograph of a river meandering through a landscape of agricultural fields and dense forests. The river is a central feature, winding from the top left towards the bottom left. The surrounding land is a mix of golden-brown harvested fields and vibrant green pastures and forests. A semi-transparent dark banner is overlaid horizontally across the middle of the image, containing the text 'OVERARCHING FINDINGS' in white, bold, sans-serif capital letters.

OVERARCHING FINDINGS

Yield & Income Benefits of Soil Health Practices Across Seven “Soil Health Successful” Row Crop Farms

- **Improved Yield:**

- 2 farms reported no yield change
- 5 reported yield increases
- Range: 2% to 22% for at least one crop grown

- **Annual Change in Net Income:**

- 7 farms reported increases in income
- Range: \$11 to \$56/ac/yr

- **Return on Investment:**

- 7 farms reported positive ROI
- Range was 18% to 343%



Input Benefits & Costs of Soil Health Practices Across Seven Row Crop Farms

- **Changes to Fertilizer Costs:**

- 1 farm increased costs
- 4 farms reduced costs
- 2 farms saw no change in costs
- Range in savings: \$18 to \$66/ac/yr

- **Changes to Machinery, Fuel, and Labor Costs due to Change in Tillage:**

- 1 farm reported no change
- 6 farms reduced costs
- Range: \$14 to \$72/ac/yr



Input Benefits & Costs of Soil Health Practices Across Seven Row Crop Farms

- **Pesticide Usage:
(Herbicide, Insecticide, and Fungicide)**

- 3 farms reported no change
- 4 reported changes
 - 2 farms increased; Range: \$5 to \$11/ac/yr
 - 2 farms decreased; Range: \$15 to \$19/ac/yr

- **Learning Costs:**

- Ranged from \$415 to \$12,940/yr or
44 cents to \$10.35/ac/yr



Environmental Benefits of Soil Health Practices Across All Farms

- **Water Quality Improvement:**

All 7 row crop farmers *observed* reduced soil and water runoff

On selected fields for 7 row crop farms plus one almond grower, NTT estimated:

- Average reduction in N losses was 61% (range was 23 to 72%)
- Average reduction in P losses was 73% (range was 33 to 92%)
- Average reduction in sediment losses was 81% (range was 37 to 99%)

- **Climate Improvement:**

On selected fields of 7 row crop farmers and both almond growers, COMET-Farm estimated total GHG emissions were reduced an average of 158% (range was 16 to 560%)



A close-up photograph of a bee on a red and yellow flower. The bee is positioned on the right side of the flower, facing left. The flower has many petals with a gradient from red to yellow. The background is blurred green foliage. A semi-transparent dark horizontal band is overlaid across the middle of the image, containing the text.

WAYS TO USE THE CASE STUDIES WITH YOUR FRPP LANDOWNERS & FARMERS

Options for Conversations & Handouts

- Reach out & establish a working relationship with conservation professionals to:
 1. Share the case studies & materials
 2. Introduce your landowners/farmers to for assistance on the next step in their SH journey
- Print Case Studies & use as Handouts
- Print the 4 Slides with Summary Results for 7 Row Crop Farmers (IL, OH, NY) as a Handout
- Print the “Stories via Multiple Slides” for 2 OH, 3 NY, and 1 PA case studies (and 1 IL predictive assessment)
- Print the 1 Individual Slides for 2 OH, 3 NY, and 1 PA case studies (and 1 IL predictive assessment)



A man and a young child are crouching in a shallow stream, fishing together. The man, on the left, is holding a red fishing net and looking down at it. The child, on the right, is also looking down and holding the handle of the net. They are both wearing dark clothing and boots. The background is a dense forest with trees and foliage, and the water in the stream is clear and flowing. The overall scene is peaceful and suggests a family activity in nature.

ACCESSING THE CASE STUDIES

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SEARCH | FARMLAND PROTECTION DIRECTORY | DATA & STATS | NEWS

FARMLAND INFORMATION CENTER

Info For ▾ Resources ▾ Browse by State About ▾ Q










Publications




[Back to Publications](#)

Soil Health Case Studies

Nine compelling and easy-to-read two-page soil health economic case studies were developed by American Farmland Trust (AFT) through a 2018 USDA Natural Resources Conservation Service (NRCS) Conservation Innovation Grant (CIG). AFT's project is called, "Accelerating Soil Health Adoption by Quantifying Economic and Environmental Outcomes & Overcoming Barriers on Rented Lands." The case studies feature almond farmers in California, corn-soybean farmers in Illinois and Ohio, and diversified crop farmers in New York.

DOWNLOADABLE DOCUMENTS

-  **California, Okuye Farms - Soil Health Case Study**
0.33 Mb
-  **California, Rogers Farm - Soil Health Case Study**
0.3 Mb
-  **Illinois, Ifft Yorkshires Farms - Soil Health Case Study**
0.39 Mb
-  **Illinois, Thorndyke Farms - Soil Health Case Study**
0.42 Mb
-  **New York, HaR-Go Farms - Soil Health Case Study**
1.02 Mb
-  **New York, Macauley Farms - Soil Health Case Study**
0.44 Mb
-  **New York, Swede Farm LLC - Soil Health Case Study**
0.39 Mb
-  **Ohio, Homewood Farms - Soil Health Case Study**
0.32 Mb
-  **Ohio, MadMax Farms - Soil Health Case Study**
0.37 Mb



Download the case studies from AFT's site

<https://farmlandinfo.org/publications/soil-health-case-studies/>

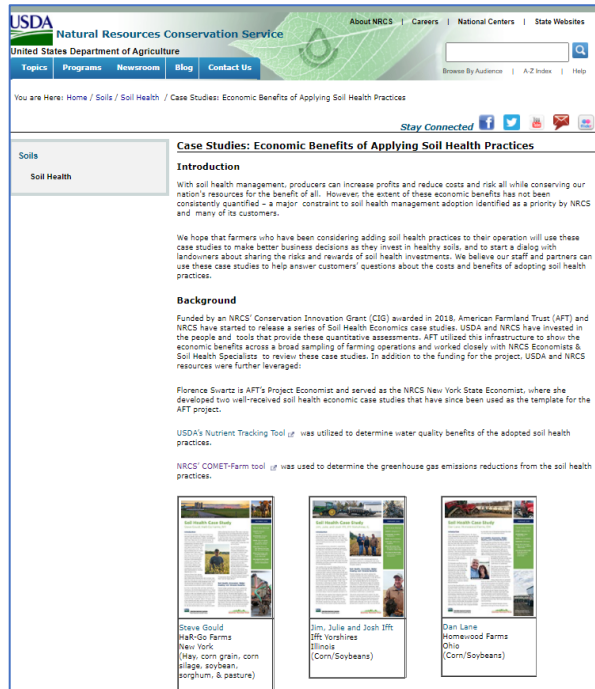
Keyword search:

"AFT soil health case studies"

"AFT economic case studies"

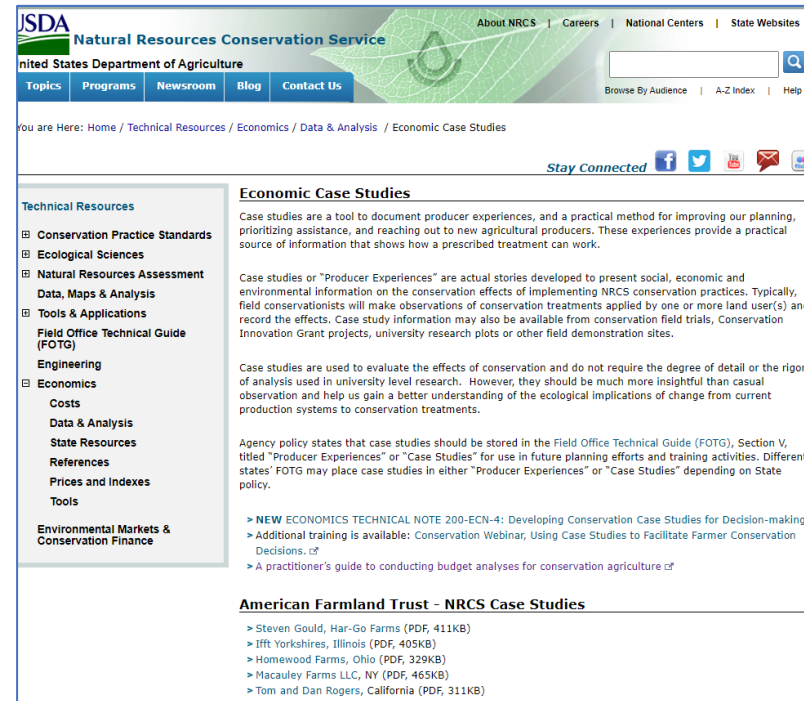
Download the case studies from 2 NRCS sites

NRCS / Home / Soils / Soil Health / Case Studies: Economic Benefits of Applying Soil Health Practices



[https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/health/?cid=NRCSEPRD1470394;](https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/health/?cid=NRCSEPRD1470394)

NRCS / Home / Technical Resources / Economics / Data & Analysis / Economic Case Studies



[https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/econ/data/?cid=nrcseprd1298423.](https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/econ/data/?cid=nrcseprd1298423)

Keyword search:
“NRCS economic case studies”

An aerial photograph of a rural landscape. A paved road runs diagonally from the bottom left towards the top center. To the right of the road, there are large, vibrant green agricultural fields. A small farmstead with a red barn and several smaller buildings is situated near the road. In the bottom left corner, there's a small cluster of trees and a blue swimming pool. The overall scene is a mix of cultivated land and natural vegetation.

ACCESSING THE RETROSPECTIVE SOIL HEALTH ECONOMIC TOOL KIT TO DEVELOP YOUR OWN CASE STUDIES

Getting into the Retrospective Tool Kit

(just updated July 13, 2021!)

- For background, start here:

<https://farmland.org/soil-health-case-studies-methods/>

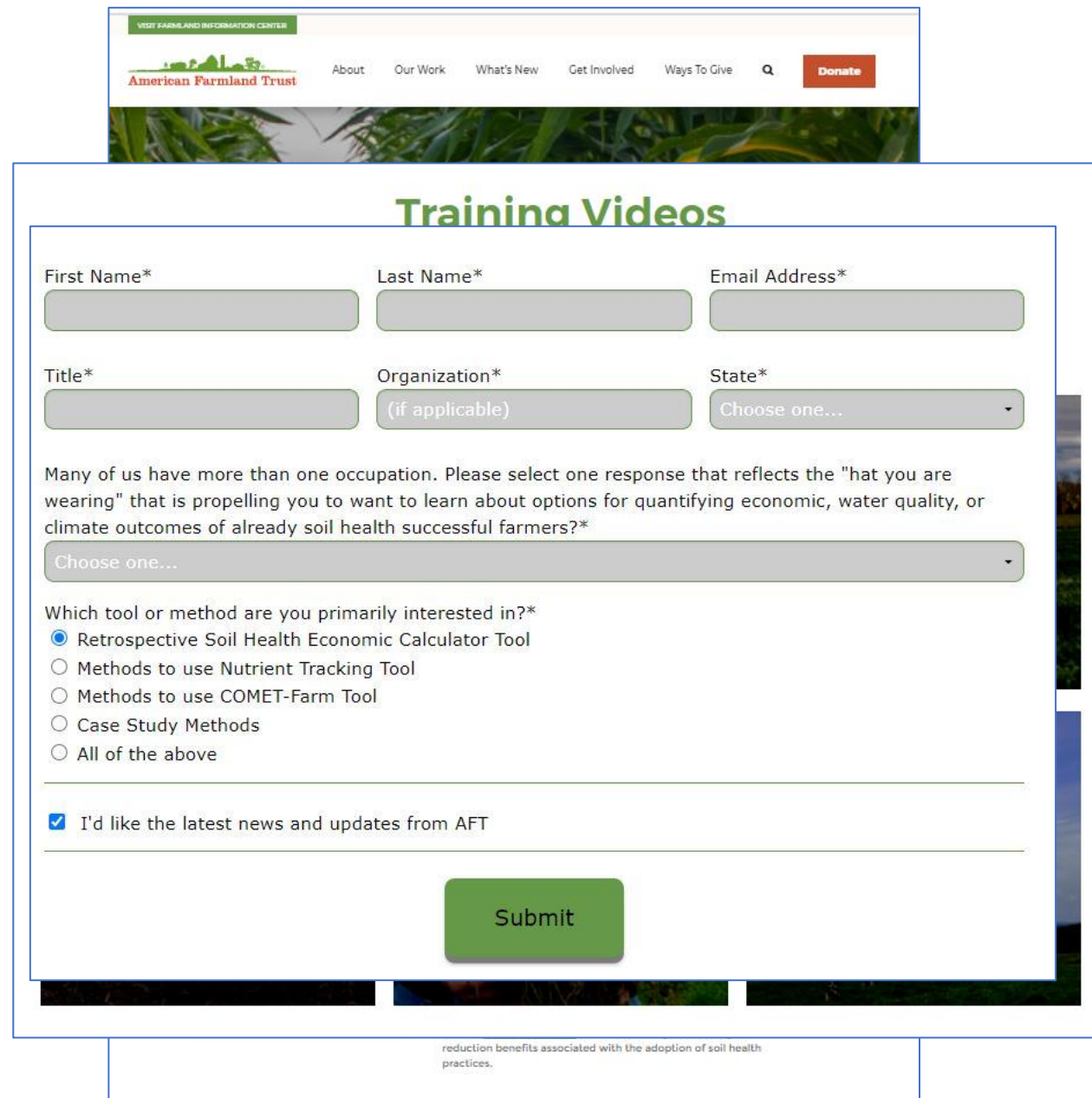
- Watch training videos from 2020 SWCS workshop

- To gain access, fill out form here:

https://farmland.salsalabs.org/sh_casestudies_methods/index.html

Keyword search:

“AFT soil health tool kit”



The screenshot shows the American Farmland Trust website with a navigation bar including links for 'About', 'Our Work', 'What's New', 'Get Involved', 'Ways To Give', a search icon, and a 'Donate' button. Below the navigation bar is a banner image of green crops. The main content area is titled 'Training Videos' and contains a registration form. The form has fields for 'First Name*', 'Last Name*', 'Email Address*', 'Title*', 'Organization*' (with '(if applicable)' below it), and 'State*' (a dropdown menu with 'Choose one...' selected). Below these fields is a paragraph: 'Many of us have more than one occupation. Please select one response that reflects the "hat you are wearing" that is propelling you to want to learn about options for quantifying economic, water quality, or climate outcomes of already soil health successful farmers?*' followed by a dropdown menu with 'Choose one...' selected. Then, there is a question: 'Which tool or method are you primarily interested in?*' with five radio button options: 'Retrospective Soil Health Economic Calculator Tool' (selected), 'Methods to use Nutrient Tracking Tool', 'Methods to use COMET-Farm Tool', 'Case Study Methods', and 'All of the above'. Below this is a checkbox labeled 'I'd like the latest news and updates from AFT' which is checked. At the bottom of the form is a green 'Submit' button. At the very bottom of the page, there is a small text box that reads: 'reduction benefits associated with the adoption of soil health practices.'

reduction benefits associated with the adoption of soil health practices.

Access gained!



American Farmland Trust

Thank you for completing the form!

Here is [a link to the OneDrive folder](#) where you can download any of the resources AFT is providing to assist others in interviewing farmers to quantify economic, environmental, and social outcomes associated with their already adopted soil health practices. You will also receive an email with a link to a OneDrive folder with "Access Granted" subject line. Download all the Tool Kit resources you do not have to re-submit the "Gain Access" form.

If you have questions about these resources, please contact AFT's Soil Health and Water Initiative Director, [Dr. Michelle Perez](#) at mperez@farmland.org. If you have questions with the R-SHEC Tool, please contact [Ellen Yeatman](#), AFT's Water Resource Specialist and Agricultural Economist, at eyeatman@farmland.org.

AFT would appreciate an appropriate attribution should you use any of these resources in your work. Please include the AFT logo and text: "Soil Health Case Study Methods Tool Kit" you use the methods or develop a case study! Thank you!

[Access the Resources](#)

Contact Us

American Farmland Trust
1150 Connecticut Avenue, NW, Suite 600
Washington, DC 20036
(202) 331-7300
info@farmland.org

No No

America

Access Granted: Link AFT Soil Health Tool Kit



Michelle Perez, PhD from American Farmland Trust <info@farmland.org>
To Michelle Perez



5:37 PM

[If there are problems with how this message is displayed, click here to view it in a web browser.](#)



Dear Michelle,

Thank you for completing the form to access American Farmland Trust's Retrospective Soil Health Economic Calculator and accompanying resources, known as the Soil Health Case Study Tool Kit. We will contact you with any updates to the resources.

Here is [a link to the OneDrive folder](#) where you can download any of the Tool Kit resources AFT is providing to assist others in interviewing "soil health successful" row-crop farmers and almond growers to quantify economic, water quality, and climate outcomes associated with their already adopted soil health practices.

If you have questions about these resources, please feel free to contact me, Michelle Perez, AFT's Soil Health Case Study Project Leader and Water Initiative Director, at mperez@farmland.org. For help troubleshooting problems/issues with the resources, please contact Ellen Yeatman, AFT's Water Resources Specialist and Agricultural Economist, at eyeatman@farmland.org.

TRAINING MATERIALS

- Published AFT Soil Health Case Studies
- Soil Health Tool Kit Terms of Use
- Soil Health Tool Kit Materials List
- UPDATED – Row Crop Case Study Tool Kit Training Session Syllabus: 2020 SWCS Workshop
- Row Crop Training PowerPoint
- NEW – Almond Case Study Tool Kit Training Session Syllabus: 2021 AFT-ABC Webinar
- NEW – Almond Training Session DAY 1 PowerPoint (economic methods)
- NEW – Almond Training Session DAY 2 PowerPoint (environmental analysis)

METHODS TO IDENTIFY A "SOIL HEALTH SUCCESSFUL" PRODUCER

- Criteria for Selecting "Soil Health Successful" Producers
- UPDATED – Case Study Introduction & Consent Form for the Producer
- UPDATED – Row Crop Pre-Interview Form
- NEW – Almond Pre-Interview Form
- Tips for Conducting the Interviews
- Tips for Obtaining and Selecting Photos

ECONOMIC METHODS

- UPDATED – Row Crop R-SHEC Questionnaire (Word)
- UPDATED – Row Crop R-SHEC Tool (Excel)
- NEW – Almond R-SHEC Questionnaire (Word)
- NEW – Almond R-SHEC Tool (Excel)
- NEW – Row Crop and Almond Machinery and Fertilizer Costs (Excel & PDF)
- PBA Table Suggested Wording Edits for Row Crops and Almonds (Excel)

ENVIRONMENTAL METHODS

- UPDATED – Row Crop NTT-COMET Data Intake Form
- NEW – Almond NTT-COMET Data Intake Form
- Tips to Tweak Dropdown Menus in NTT-COMET Data Intake Form
- Tips for Analyzing COMET Results
- Excel Demonstration of Analyzing COMET Results

METHODS FOR WRITING AND PRODUCING A CASE STUDY

- Case Study Template
- Guidance for Writing Case Study
- Tips for Obtaining Farmer Review
- Tasks & Hours Estimates for Producing One Case Study

My files > Documents > Soil Health Case Study Methods To

File icon	Name	Modified	Modified By	File size	Sharing
	1 - Training Materials	July 12	Michelle Perez	8 items	Shared
	2 - Methods to Identify a Soil Health Succ...	July 12	Michelle Perez	6 items	Shared
	3 - Economic Methods	July 12	Michelle Perez	6 items	Shared
	4 - Environmental Methods	July 12	Michelle Perez	5 items	Shared
	5 - Methods for Writing & Producing a C...	July 12	Michelle Perez	4 items	Shared



NEW TOOLS UNDERWAY

AFT's Economic Tools

Retrospective Soil Health Economic Tool

- For use with “soil health successful” producers
- To conduct a retrospective partial budget analysis
- To produce 2-page case studies
- Updated July 2021

Predictive Soil Health Economic Tool

- For use with “soil health curious” producers
- To conduct a predictive short-term partial budget analysis & a long-term benefits analysis
- To produce 7-page predictive assessments
- Public release this Fall

Online Soil Health Economic Tool

- A simpler, easier-to-use version of both retrospective and predictive tools
- We hope to:
 - Test the new tool with Illinois & Ohio farmers
 - Launch the new tool in 2022



DEMO OF ONLINE ECONOMIC TOOLS

An underwater photograph showing a pair of hands gently holding a rainbow trout. The fish is positioned horizontally, with its head to the right and tail to the left. The hands are visible from the wrists up, with fingers supporting the fish's body. The background is a clear, greenish-blue water with some light reflections on the surface. The bottom of the frame shows dark, mossy rocks.

Thank you!

*Please give us
feedback!*

Over time, please let us know if you're using the case studies to encourage FRPP landowners or farmers to adopt soil health practices. Contact: mperez@farmland.org

*We look forward to your feedback on this Case Study Session #4!
Find link in end-of-day email from Pathable.
Thank you for your feedback!*