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U.S. Farmer Decisions on Cover Crop Adoption

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Cereal Rye Followed by Soybeans

Cowpea in Corn-Soybean-Wheat Rotation

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OSU South Centers

Piketon, Ohio

Summary of Soil Health Benefits

Summary of soil health management system benefits reported by 100 farmers.

Benefits Reported	% Responding Yes
Increased Yield	67
Reduced Applied Fertilizer	83
Increased Crop Resilience	97
Increased Field Access	93
Improved Loan, Land, or Insurance Terms	41
Improved Water Quality	100
Protects License to Operate	98
Increased Soil Organic Matter	54

Soil Health Institute, 2021

United States Farmers are Business Managers First

Change farming and land use practices when data indicates improvement in net income, and other considerations

Adoption of cover crops is gradual, currently about 5% of all U. S. farmers have adopted

Economic analysis of cover crops is a long-term proposition

Consider as an investment such as installation of drainage tile or irrigation

Perspective also should be broader, what is sustainable … holistic, generational thinking

National Cover Crop Survey

SARE
Sustainable Agriculture Research & Education
www.sare.org

- Conducted by Conservation Technology Information Center – funded by USDA/SARE
- Data reported for 2012 – 2016 Crop Years
- Surveys completed by about 2,000 farmers each year
- National in scope across major crop states
- Full report at sare.org/covercropsurvey

Yield Increase with Cover Crops

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Percent increase in yield for corn and soybeans following cover crops versus comparably managed fields with no cover crops[1]

CROP YEAR	CORN	SOYBEANS
2012	9.6%	11.6%
2013	3.1%	4.3%
2014	2.1%	4.2%
2015	1.9%	2.8%
2016	1.3%	3.8%

[1] Data is from the SARE/CTIC National Cover Crop Surveys conducted annually for crop years 2012–2016.

Yield Increase Over the Years

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Percent increase in corn and soybean yields after one, three and five years of consecutive cover crop use on a field, based on a regression analysis of data for crop years 2015 and 2016[1]

	ONE YEAR	THREE YEARS	FIVE YEARS
Corn	0.52%	1.76%	3%
Soybeans	2.12%	3.54%	4.96%

[1]Figures shown are an average of yields from the 2015 and 2016 growing seasons, with yield data obtained from about 500 farmers each year through the SARE/CTIC National Cover Crop Survey.

Cost of Seeding Cover Crops

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Cost of seeding cover crops

ITEM	COST PER HECTARE
Cover crop seed	$25–$124
Seeding the cover crops	$12–$44
Termination	$0–$25
Subtotal range	**$37-$193**
Median cost from survey	**$91**

Cover Cropping Costs & Profits-Corn

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Impact of cover crops on costs, returns and net profit for corn following one, three and five years of cover crop use and with various management scenarios

BUDGET ITEM	YEARS OF COVER CROPPING		
All figures are per hectare	One	Three	Five
Estimated input savings when using cover crops			
Fertilizer[1]	$0	$34.84	$54.11
Weed control[2]	$0–$37.07	$24.71–$61.78	$24.71–$61.78
Erosion repair[3]	$4.94–$9.88	$4.94–$9.88	$4.94–$9.88
Subtotal	**$4.94–$46.95**	**$64.49–$106.50**	**$83.76–$125.77**
a. Savings on inputs (the low end of the subtotal range from above)	$4.94	$64.49	$83.77
b. Income from extra yield in normal weather year (survey data)[4]	$8.99	$30.44	$51.89
c. Cost of seed and seeding (survey data)[5]	$91.43	$91.43	$91.43
Net return in a normal weather year (a + b - c)	**-$73.45**	**$3.50**	**$44.23**

Cover Cropping Costs & Profits-Soybeans

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Impact of cover crops on costs, returns and net profit for soybeans following one, three, and five years of cover crop use and with various management scenarios

BUDGET ITEM	YEARS OF COVER CROPPING		
All figures are per hectare	One	Three	Five
Estimated input savings when using cover crops			
Fertilizer[1]	$0	$15.57	$20.76
Weed control[2]	$0–$37.07	$24.71–$61.78	$24.71–$61.78
Erosion repair[3]	$4.94–$9.88	$4.94–$9.88	$4.94–$9.88
Subtotal	**$4.94-$46.95**	**$45.22-$87.23**	**$50.41-$92.42**
a. Savings on inputs (the low end of the range from above)	$4.94	$45.22	$50.41
b. Income from extra yield in normal weather year (survey data)[4]	$28.29	$47.25	$66.17
c. Cost of seed and seeding (survey data)[5]	$91.43	$91.43	$91.43
Net return in a normal weather year (a + b - c)	**-$58.20**	**$1.04**	**$40.91**

Factors that can enhance economics of Cover Crop Adoption

Vary from farm-to-farm and by specific field

- Herbicide resistant weeds
- Grazing livestock on cover crops
- Soil compaction problems
- To facilitate transition to no-tillage methods
- Soil moisture retention/reduced irrigation
- Fertilizer costs/ manure nutrient sequestered
- Incentive payments are available

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Unique Case: Brandt Farm

Long time leader of no-till and cover crop adoption in Ohio

- Over 40 years experience with cover cropping methods
- About 1000 acres/400 hectares of cropland
- Trials with many species and mixes of cover crops

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Long Term Changes Relative to Conventional practices - Brandt

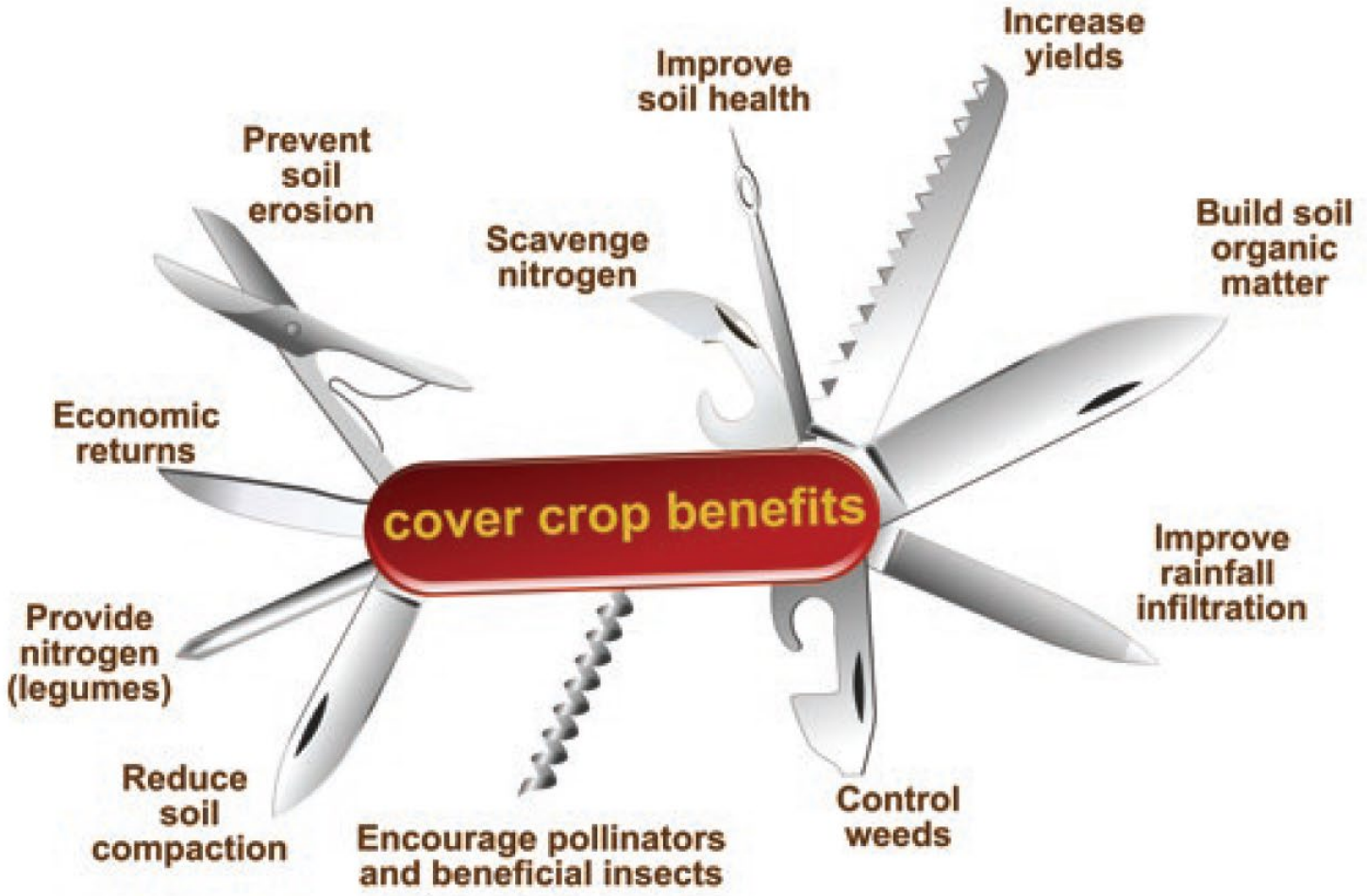
	Percent Change	
	Corn	Soybeans
Variable Costs of production	-42	-47
Yield Change	-7	+19
Return to Land, Labor & Mgmt.	+37	+78

Image by *Farm and Dairy*

Three Year Cumulative Margins

	$ PER Hectare
Conventional Corn/Soy/Corn	2602
No Till Corn/ Soy /NT Corn	2723
No till and cover crop Corn/Soy/Wheat	3093

The Many Benefits of Cover Crops



The many benefits that cover crops provide contribute to increasing yield response and lower input costs over time. *Illustration by Carlyn Iverson*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Original soil quality
(Annually plowed field)
Improved soil quality
(No-till with cover crop)

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Thank You for Listening!

QUESTIONS?