



# Cover Crops, Farm Economics, and Policy

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**I** ILLINOIS

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# Topics

1. Social and private benefits of cover crops
2. Farm-level returns and costs
3. Policy

# Societal benefits

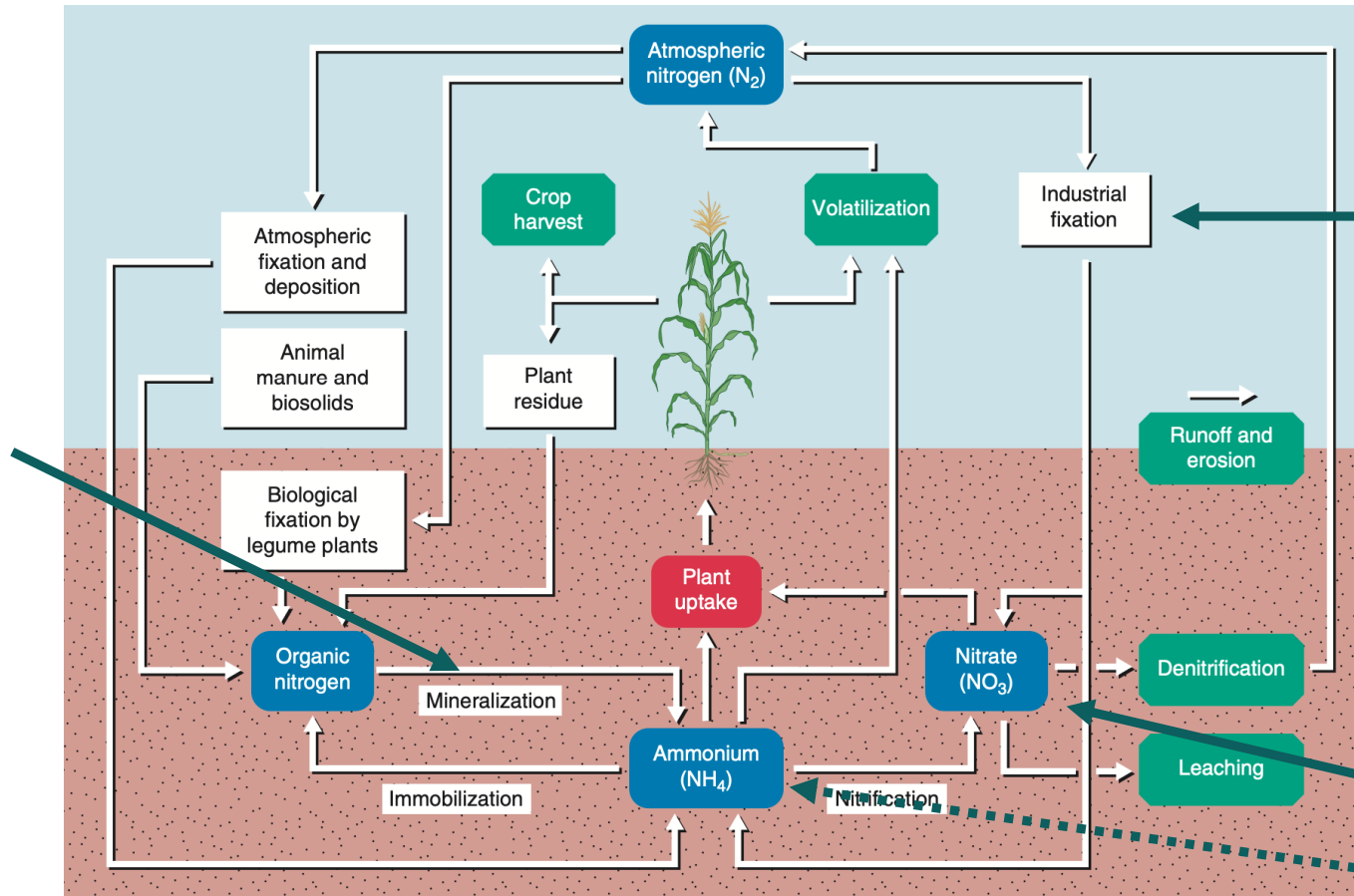
1. Reductions in soil erosion
2. Soil carbon sequestration
  - Growth in cover crop sequesters carbon (usually no-till)
  - Nascent carbon markets may encourage cover crop use
3. Nutrient (nitrogen) effluent reduction



Organic nitrogen is mineralized and becomes available to both plants and leaching

Stochastic process that begins in spring

If growing, cover crops capture inorganic N and converts to organic N thereby reducing leaching



Fertilizer generally is in inorganic form

Inorganic forms available for plant and leaching ( $NO_3$ )

**Nitrogen Cycle (figure from Illinois Agronomy Handbook, Figure 9-7)**

# Illinois Nutrient Loss Reduction Strategy



**Goal: 45% Reduction** in Total N & Total P Losses by **2035**

**Interim: 15% Reduction** in NO<sub>3</sub>-N & 25% Reduction in Total P by 2025

# Societal benefits

1. Reductions in soil erosion
2. Soil carbon sequestration
  - Growth in cover crop sequesters carbon (usually no-till)
  - Nascent carbon markets may aid encourage cover crop use
3. Nutrient (nitrogen) effluent reduction
4. Potential private benefits (soil health)

# Economics

## Sustainable Agriculture Research and Education (SARE)

- USDA program
- Suggests that use of cover crops will be profitable after 3 years

# Managing Cover Crops Profitably

THIRD EDITION





# Economics

## Sustainable Agriculture Research and Education (SARE)

- **USDA program**
- **Suggests that use of cover crops will be profitable after 3 years**

## Agricultural Economic Studies

- Zhou et al.
  - Cotton, cover crops not profitable
- Plastina et al.
  - Midwest, corn and soybeans, cover crops not profitable without cost share
- Hughes and Langemeir
  - Indiana, corn, cover crops need to increase nitrogen rate
- Sellars et al.
  - Illinois, corn and soybeans



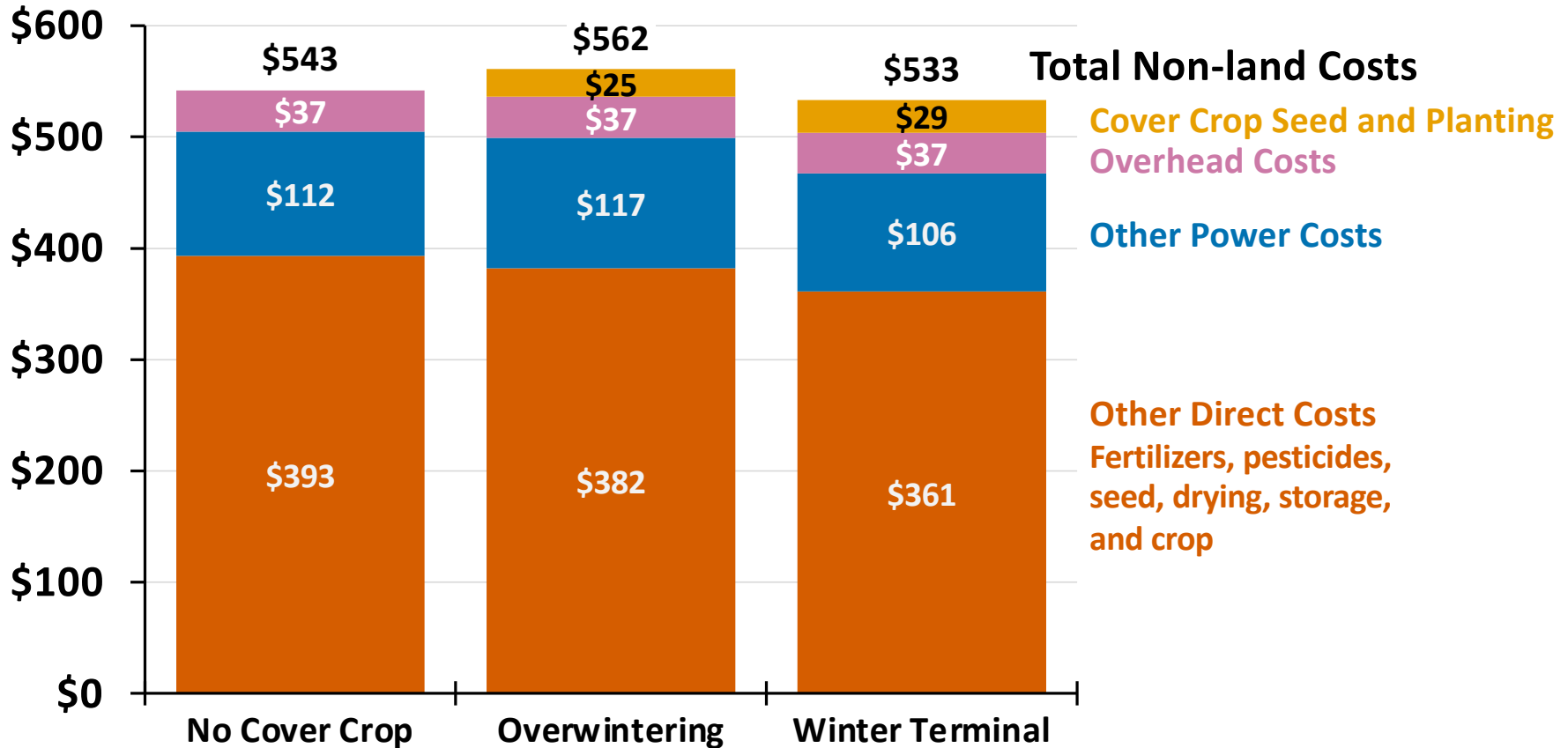
# Cover Crops – Sellars, et al.

Illinois, Corn, High SPR, Average from 2015 to 2021

	Overwintering	Winter Terminal	No Cover Crop
Number of Fields	243	109	3523
Yield per Acre	214	215	221
Soil Productivity Rating	139	139	140
Gross Revenue	\$833	\$834	\$856
Total Non-land Cost	\$562	\$533	\$543
Operator & Land Return	\$271	\$301	\$313

# Cover Crops Costs

Corn, High SPR, Average from 2015 to 2021



# Cover Crops

## Soybean, High SPR, Average from 2015 to 2021

	<b>Overwintering</b>	<b>Winter Terminal</b>	<b>No Cover Crop</b>
<b>Number of fields</b>	588	28	3,066
<b>Yield per acre</b>	68	68	70
<b>Soil Productivity Rating</b>	139	139	140
<b>Gross Revenue</b>	\$666	\$675	\$686
<b>Total Non-land Costs</b>	\$290	\$276	\$266
<b>Operator &amp; Land Return</b>	<b>\$376</b>	<b>\$399</b>	<b>\$420</b>

# Policy

- State programs (Maryland, Iowa, Illinois)
- USDA, NRCS programs
  - Environmental Quality Incentives Program (EQUIP)
  - Conservation Stewardship Program
  - Regional Conservation Partnership Program (RCPP)
- RMA – Pandemic Cover Crop Program (PCCP)
  - \$5 reduction in premium on crop insurance program if plant cover crops
  - Not really insurance, subsidy (or cost share) for crop insurance users



# NRCS Programs

## 2021 Funding and Acres \*

Program	Funding	Acres
	(\$ million)	(million)
EQUIP	\$1,263	11.6
CSP	511	9.7
RCPP	34	.2
<b>Total</b>	<b>\$1,809</b>	<b>21.6</b>

\* Includes more practices than cover crops

## Facts

- Significantly correlated with cover crops use
- Low funding, impacts few acres
- Have awareness and transaction cost issues
  - Farmers not aware
  - Filling out the application time consuming
  - Documenting results

## Recommendation:

- Implement a Federal cover crop introduction program
- Provide significant funds (\$/acre) to try cover crops:
  - Low transaction costs
  - \$1 billion per year, \$50 per acre gets 20 million acres
  - Limited length to program

# Summary

- Hope, but no conclusive evidence, that suggests private benefits will cause cover crop adoption
  - Good arguments that it will: Soil health benefits and conservation tillage experience
  - Good arguments that it will not: No studies that have looked at the long-term soil benefits for cover crop use
- Potential benefits justify government policy intervention