



# Cover Crops

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National Institute of Food and Agriculture

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*Cropping Systems Coordinated Agricultural Project: Climate Change, Mitigation, and Adaptation in Corn-based Cropping Systems*

# Cover crops to improve resilience?

- A living, growing plant at times of year when we normally have nothing growing.
- Capture sunlight, feed soil organisms, sequester carbon, trap and recycle nutrients, improve soil quality
- Make better use of the resources and time available!

So, choose your cover crop to meet  
your main purposes  
(no one cover crop does everything!)

- Oh, there are so many interesting cover crops to choose from! Where do I start?



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SUSTAINABLE  
**CORN.ORG**  
CROPS, CLIMATE, CULTURE AND CHANGE



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## Brassicas



Legumes

# Why is the Sustainable Corn Team using cereal rye as the cover crop?

- a. Most winter hardy-- **YES**
- b. Most widely adaptable--**YES**
- c. No management challenges-- **NO!!**
- d. Didn't know how to grow anything else
- e. Wanted to make good bread from product

# What is (or would be) **YOUR main** purpose for growing cover crops?

- |                        |                  |
|------------------------|------------------|
|                        | <u>Rye</u>       |
| a. Reduce erosion      | <b>Excellent</b> |
| b. Scavenge residual N | <b>Excellent</b> |
| c. Produce (fix) N     | <b>NO</b>        |
| d. Build soil health   | <b>Excellent</b> |
| e. Control weeds       | <b>Excellent</b> |

# Cover crops are part of a system!

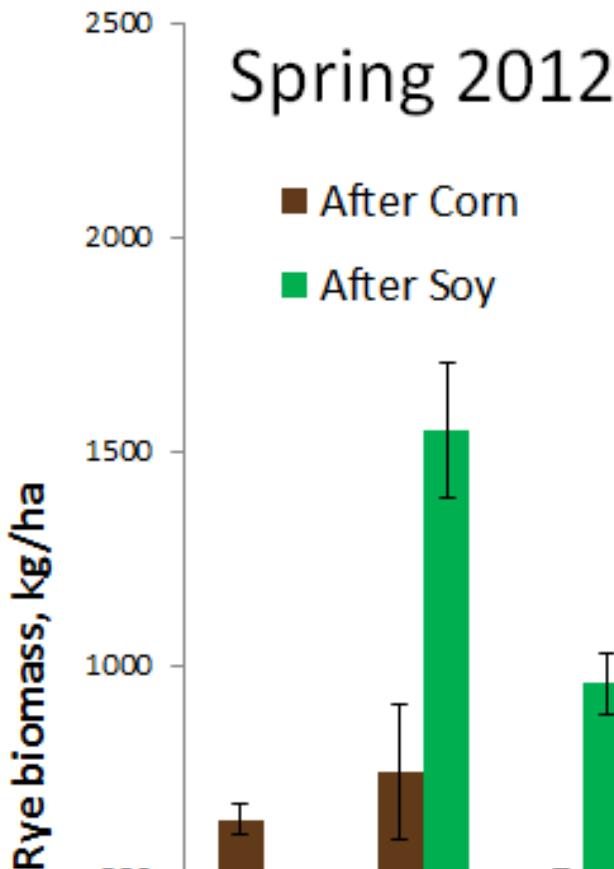
- Different potential benefits and challenges for each type of cover crop
- Must adapt cropping system, including nutrient mgmt, NT/tillage system, manure, pest mgmt, crop rotation
- Learning curve— need to do homework!

# First challenge– getting cover crops to grow!

- Reliable establishment, and adequate growth, often cited as challenges



# Rye growth

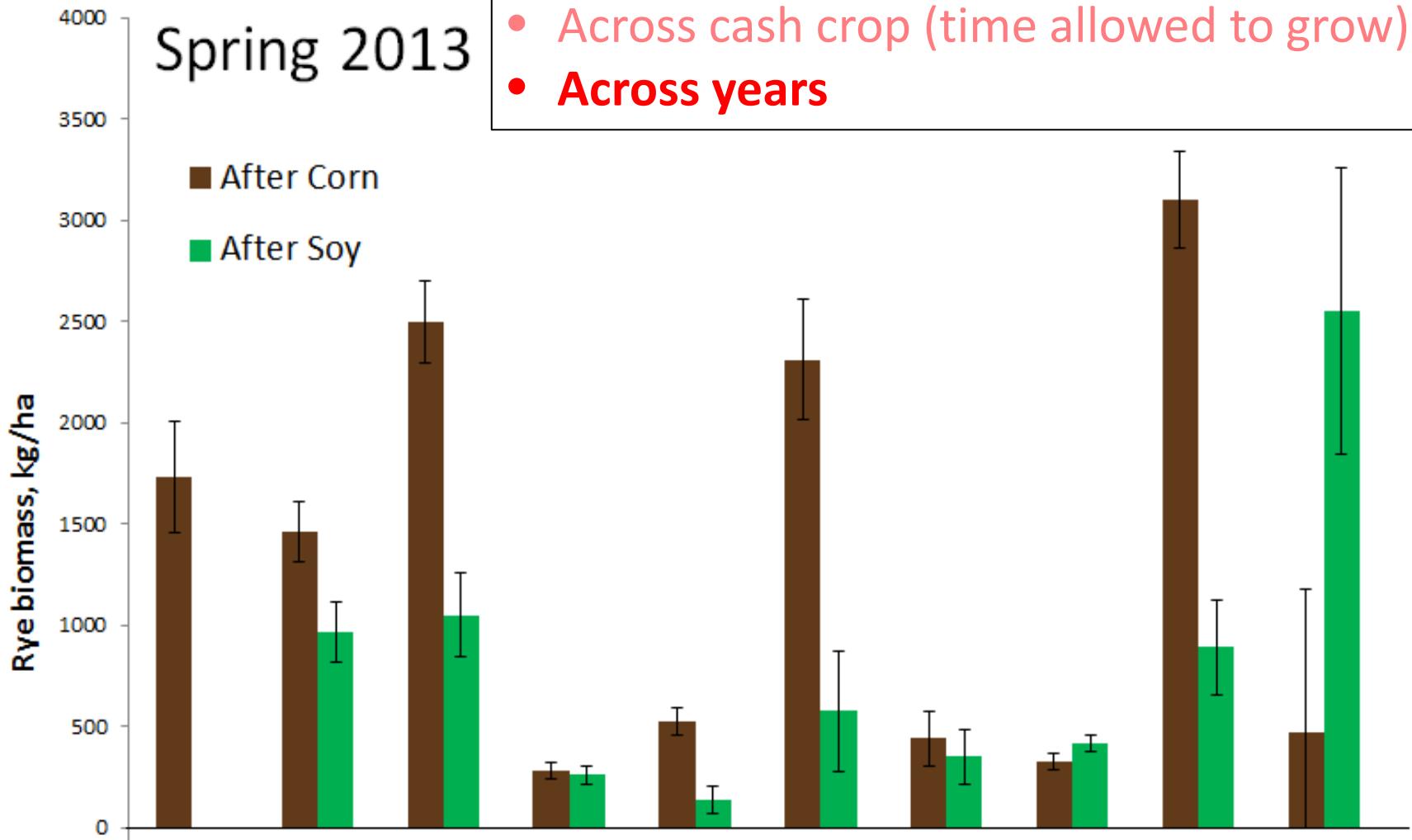


Varies:

- Across region
- Across cash crop (time allowed to grow)

Graph from A. Kravchenko

# Rye growth



Graph from A. Kravchenko

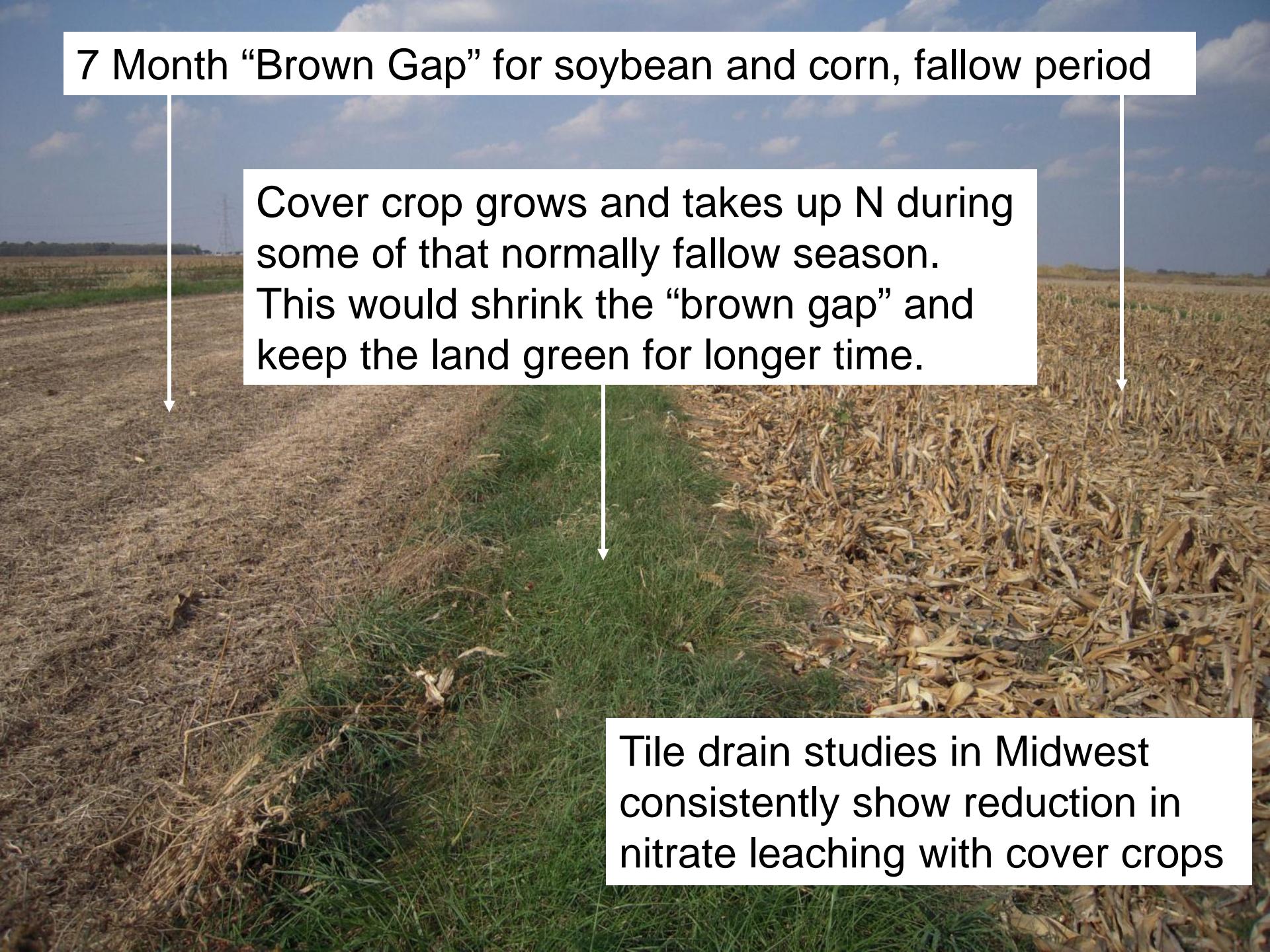
# For larger adoption in Midwest,....

- Need to further develop ways to:
  - Improve reliability of establishment
  - Get more growth (Roots? Shoots?)
  - Manage the system to reduce risks
- Different seeding methods and timings, as discussed at Field Day this morning, are part of that effort by many folks in region

# How do covers increase resilience?

- Water quality- reduce nitrate leaching
  - Off-site. Short-term (ie, NOW) ([see magazine](#))

## 7 Month “Brown Gap” for soybean and corn, fallow period



Cover crop grows and takes up N during some of that normally fallow season. This would shrink the “brown gap” and keep the land green for longer time.

Tile drain studies in Midwest consistently show reduction in nitrate leaching with cover crops

# How do covers increase resilience?

- Water quality- reduce nitrate leaching
  - Off-site. Short-term (ie, NOW) ([see magazine](#))
- Build soil organic matter
  - Long-term. Many benefits of SOM to productivity. ([see magazine](#))
- Scavenge N that would otherwise be lost
  - Long-term. Goes into **YOUR** soil bank acct.
- Reduce erosion
  - Long-term. Keeps your expensive soil on **YOUR** farm.

# Risks / Benefits

- Mulch ([see magazine](#))
  - Risk— if too much mulch and season very wet
  - Benefit— more water available in dry season
- Pest management—weeds, insects, diseases may be different- need diff mgmt.
- Crop yield ([see magazine](#))
  - Short-term may not show increase, and sometimes decrease (rye esp.)
  - Long-term investment- yield and yield stability

# How select cover crops?

- **What is your main purpose?**
- **What is your cropping / tillage system?**
  - Current cash crop and next cash crop?
  - No-till, strip till, or other systems?
- **What time windows are available?**
- **How will you seed the cover crop?**
- **Soil types, climate, drought, manure, herbicide carryover, other local issues?**



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## WHAT ARE COVER CROPS?

Cover crops are plants seeded into agricultural fields, either within or outside of the regular growing season, with the primary purpose of improving or maintaining ecosystem quality.

The goal of the *Midwest Cover Crops Council* (MCCC) is to facilitate widespread adoption of cover crops throughout the Midwest, to improve ecological, economic, and social sustainability.

## WHAT DO COVER CROPS DO FOR THE ENVIRONMENT?

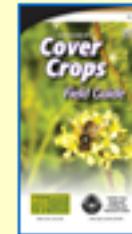
- Enhance biodiversity
- Increase soil infiltration, leading to less flooding,
- Attract honey bees and beneficial insects

## Selector Tools

► NEWS ◄

Take a chance to view some of the [upcoming webinars relating to soil health](#) from NRCS (Jan-Aug 2014)

[Cover Crops Field Guide from MCCC & Purdue University](#)



- [About the guide](#)
- [Order your copy now!](#)

## Illinois: Henry County Seeding Dates

## Location Information

## Cash Crop Information

## Soil Information

## Attribute Information

## Goal #1 Nitrogen Scavenger

Goal #2 Soil Builder

Goal #3 Select an attribute

▼

Select cover crop to create information sheet 50% HV/50% Oats

**Submit**

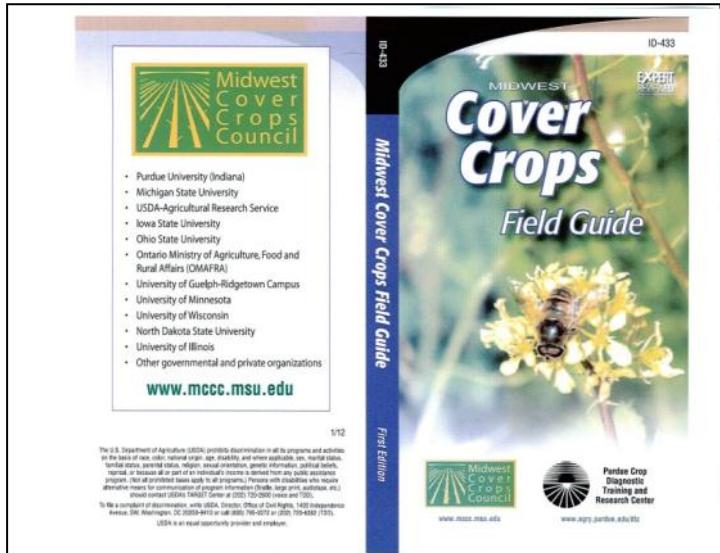
**Attribute Ratings: 0-Poor, 1-Fair**      **Reliable Establishment**      **Freeze Risk to Establishment**      **Frost Seeding**

**2-Good, 3-Very Good, 4-Excellent** **Cash Crop Growing Period: Requires Aerial Seeding or Interseeding of Cover Crop**

# Bottom line— Cover crops....

- May increase resilience, esp. long-term
- Pose some challenges/risks
  - Learning curve
  - Greater management needed
- Provide water quality benefits downstream
- More research needed to realize the full potential of cover crops in Midwest

# Resources



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**2<sup>nd</sup> Edition available ~October 1<sup>st</sup>!**

**WELCOME TO THE MIDWEST COVER CROPS COUNCIL WEBSITE**

The goal of the *Midwest Cover Crops Council* (MCCC) is to facilitate widespread adoption of cover crops throughout the Midwest, to improve ecological, economic, and social sustainability.

**WHO WE ARE?**

The MCCC is a diverse group from academia, production

**NEWS**

[Cover crops prevented planting update for IL, IN, MI, and OH \(6/10/11\)](#)

[OH and IN Senators Letter to USDA-Risk Management regarding cover crops and crop insurance](#)

[www.mccc.msu.edu](http://www.mccc.msu.edu)

**Cover Crop Selector Tools**

