

Cover Crops: A “Win-Win” Strategy for Farmers and the Environment

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**Illinois
Priority
Watersheds
to
Reduce
Nutrient
Loss**



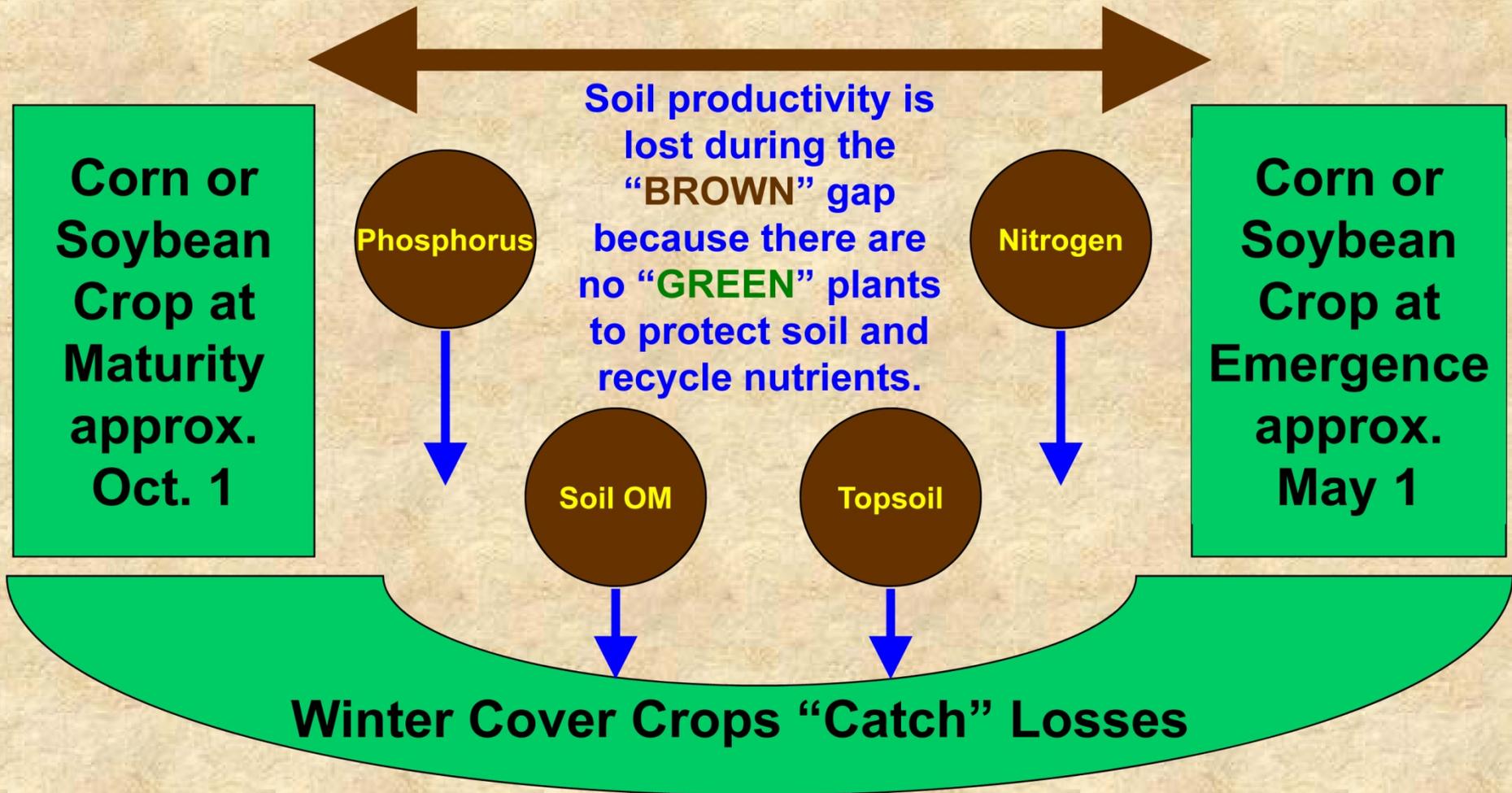
| Watershed | Target Nutrient |
|--|-----------------------------|
| Lake Bloomington | Total Phosphorus Nitrate |
| Lake Vermillion | Total Phosphorus Nitrate |
| Lake Decatur | Total Phosphorus Nitrate |
| Vermillion River (Illinois Basin) | Nitrate |
| Salt Fork Vermillion River (Wabash Basin) | Nitrate |
| Lake Mauvaille Terre | Total Phosphorus Nitrate |



Environmental Benefits of Using Cover Crops

- Reduced erosion
- Reduced nitrate leaching
- Reduced phosphorus losses
- Increased organic matter
- Improved infiltration and aeration
- Reduced weed competition

Corn and Soybeans have a 7 Month “BROWN” Gap



Cover Crops Fill the “BROWN” Gap with “GREEN” Plants

2012

Macon County, IL Cover Crop Demonstration

Purpose: Show at field scale the benefits of using cover crops for the soil, new seeding techniques, and the benefits of grazing for livestock producers.

Planting Dates: Mid to Late August 2012 using a Hagie high clearance tractor with three different styles of planting equipment - “over the top” and two between the row (rolling basket & twin coulter).

Cooperators: Brown & Brown Farms (David, Joe & Chase Brown)

Partners: Univ. of Illinois Extension, Agricultural Watershed Institute, USDA- NRCS



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Prototype Seeder

Hagie Manufacturing:

- High clearance tractor with a modified nitrogen toolbar to perform 3 seeding treatments at once
- Seed mixture: ryegrass, oilseed radish & red clover



Comparison of the Three Hagie High-Clearance Planting Treatments on Sept. 7, 2012



Time of Seeding Covers and Stage of Crop

Maturity

Light Stress



Row Direction in Standing Crops Affects Interseeded Cover Crops

East-West Rows
Rows



North-South



What Are Covers Doing Below The Soil Surface



Late Harvest

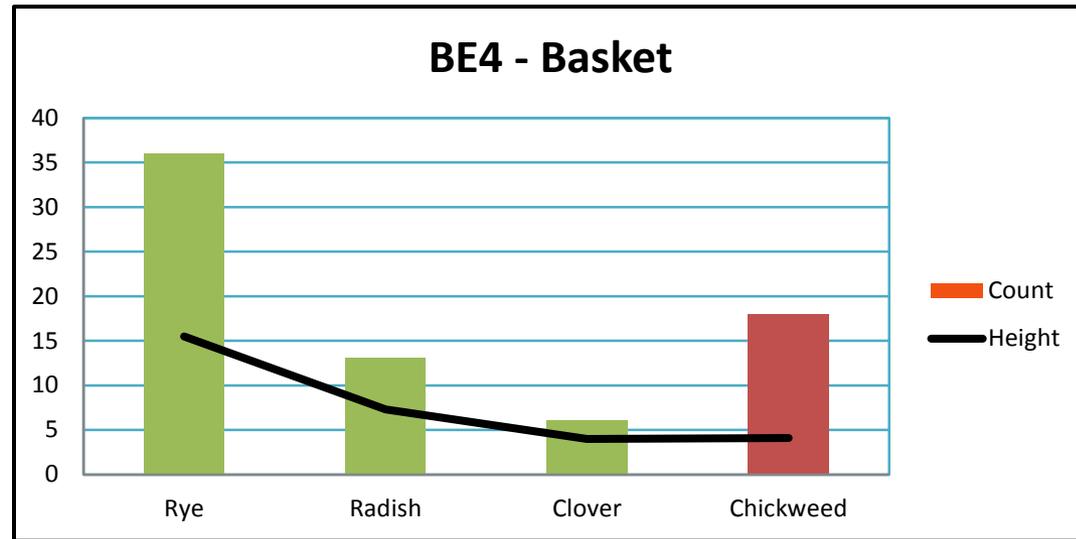


Early Harvest

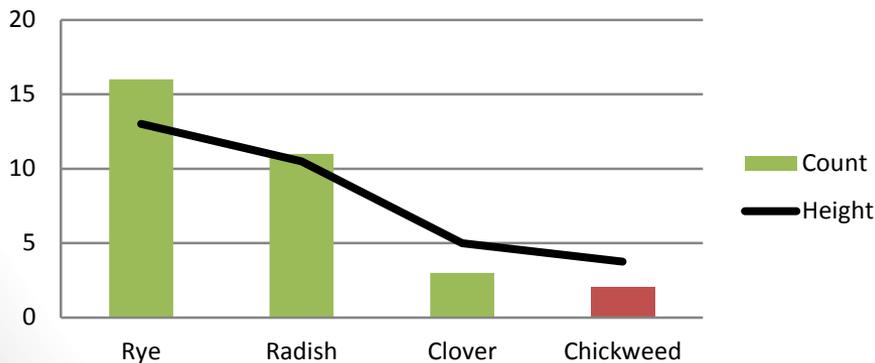


Late Harvest

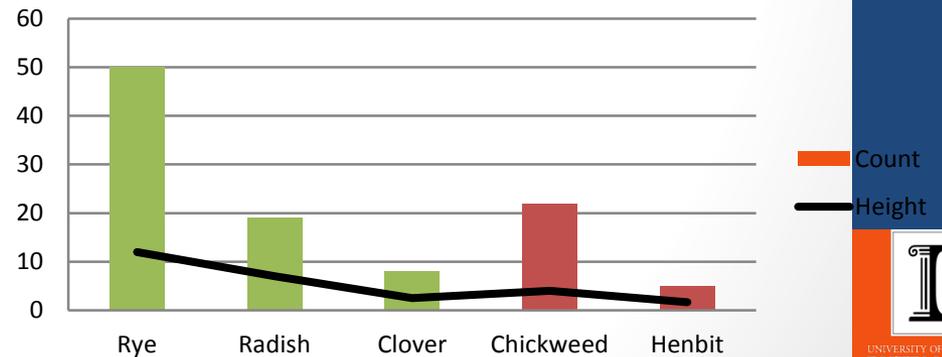
Rolling Basket – Faster Germination, Taller Plants



BE1 - Broadcast

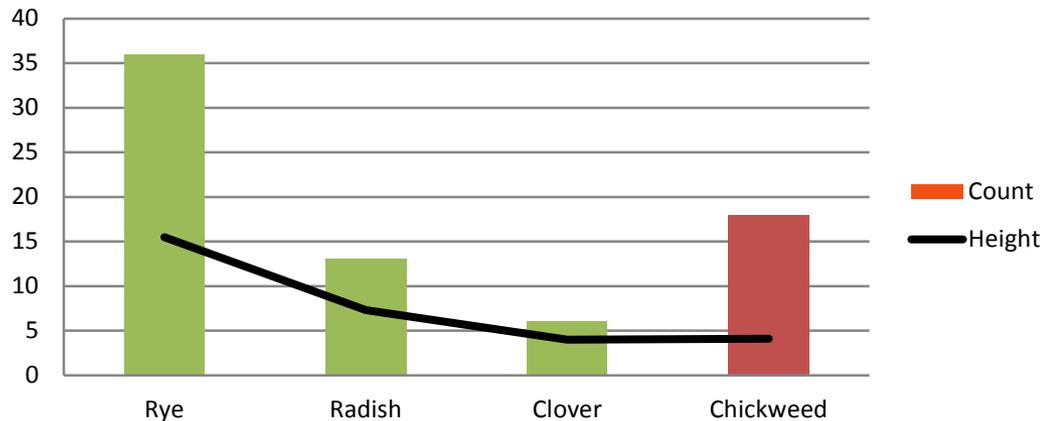


BE3 - Coulter



Early Harvest-Taller Plants

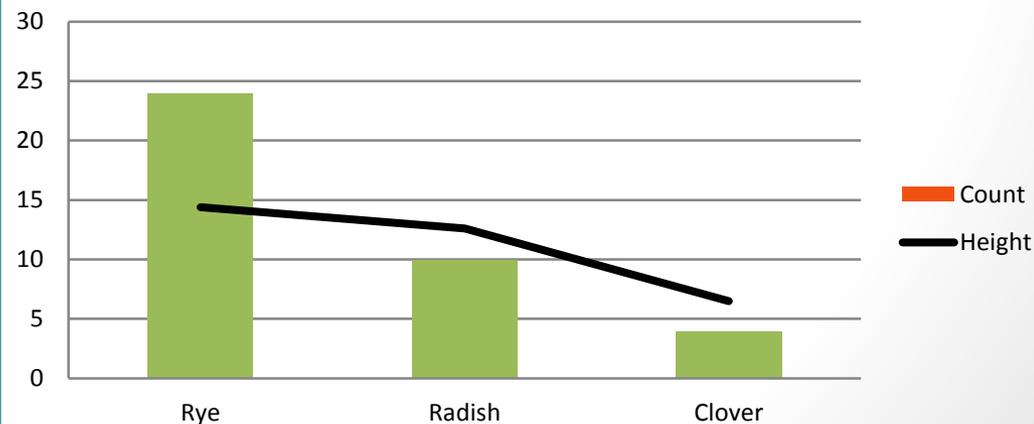
BE4 - Basket



Late Harvest

Early Harvest

BW4 - Basket



2013

- Cover Crop Promotion grant - American Farmland Trust
- Cover Crop Demonstration Plot – 2013 Farm Progress Show
- Cover Crop Meeting – Local Producers & Landowners



**Cover Crops -
Protect Your A\$\$ets!!**



August 27 -29, 2013

FIRST PROGRESS STREET

EXHIBIT FIELD (SOUTHERN EDGE)

CENTRAL
PROGRESS
AVENUE
**GATE
8**

*Easy access to
Cover Crop Plots
from south end of
Central Progress
Avenue*



Cover Crop Plots

ENTRANCE

PROGRAM TENT

| | | | | | | | | |
|---|--|--|--|--|---|-------------------------------------|---|--|
| OILSEED RADISH — OATS | TRITICALE — AUSTRIAN WINTER PEA | CEREAL RYE — CRIMSON CLOVER | RYEGRASS — CRIMSON CLOVER | HAIRY VETCH | CRIMSON CLOVER | OATS | CEREAL RYE | ANNUAL RYEGRASS |
| CEREAL RYE — AUSTRIAN WINTER PEA | OATS — RAPESEED — TURNIP — AUSTRIAN WINTER PEA | MILLET — RAPESEED — MUSTARD — OATS | CEREAL RYE — OILSEED RADISH — TURNIP — CRIMSON CLOVER | ANNUAL ALFALFA — BERSEEM CLOVER — MILLET | MILLET — FLAX — SUNFLOWER — BUCKWHEAT | CRIMSON CLOVER — TRITICALE | MILLET — TURNIP — OILSEED RADISH | MILLET — OILSEED RADISH — CRIMSON CLOVER — RYEGRASS — BUCKWHEAT — RAPESEED — TURNIP — OATS — AUSTRIAN WINTER PEA |

RIDE 'N' DRIVE

RIDE 'N' DRIVE



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Cover Crops - Protect Your A\$\$ets!!



Cover Crops & Fall N Appl.

Corey Lacey &
Dr. Shalamar Armstrong, ISU

Soil Health (@ soil pit)

Troy Fehrenbacher, NRCS

Cover Crop Basics

Doug Gucker, U of I Ext.

Cover Crop Plot Tour with Local Cover Crop Farmers

Large Crop Roller Demo

Dan Sheehan, HGB Found.

September 5, 2013

Piatt County
SWCD



Macon County
SWCD



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Other Nearby Projects:

Upper Salt Fork Ditch — Spoon River Watershed Project

A multi-year study to evaluate tile drainage modifications for reducing nitrate loss from agricultural fields

Cover Crops

Last year's dry conditions during the growing season limited corn yield and N uptake; and large amounts of unused fertilizer remained in fields after crop harvest. Researchers designed an experiment to test the ability of a cover crop to absorb unused fertilizer N and reduce potential N loss from tile drainage. Using a paired field approach with two adjacent tile systems, we planted a cover crop over

one tile, while the adjacent field and tile did not receive a cover crop. The cover crop (annual ryegrass and radish) was aerially seeded into standing corn on Sept 8, 2012. By Nov 8, the cover crop above ground biomass accumulation was substantial with nearly 1 ton of dry biomass per acre, containing more than 50 lbs of N per acre. We found the cover crop decreased nitrate loss in tile drainage by about

50% compared to the field without a cover crop. This spring we gave the cover crop a fertilizer N credit of 30 lbs per acre and decreased the fertilizer N rate accordingly. Results from this coming fall will show whether or not cover crops have improved overall production efficiency. Of the surveyed farm operators, 9.5% stated they currently use cover crops and 76.5% stated they may be willing to try this practice.



Upper Salt Fork Watershed Report – 2013
Dr. Mark David



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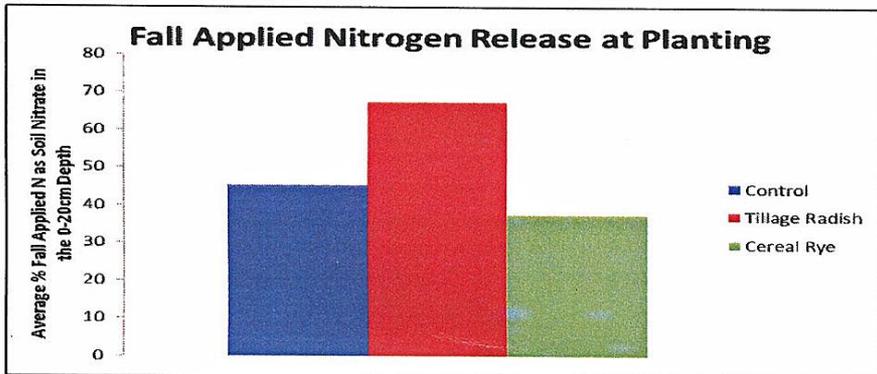


Figure 3. Graph of fall applied N release immediately before corn planting when averaged over both spring 2012 and spring 2013. On average, under tillage radish plots 68% of fall applied N can be found in the top 8 inches of the soil profile immediately before planting; in the control and cereal rye plots only 45% and 38% of fall applied N can be found in the top 8 inches.

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Impact of Cover Crops on Fall N over the Winter

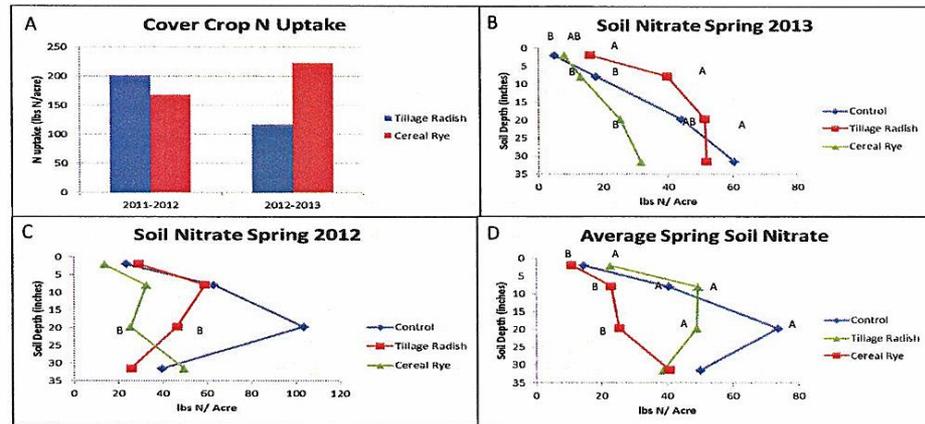


Figure 2. Nitrogen uptake for cover crop species were different between the two years, but in both years Radish and Cereal Rye demonstrated the ability to take up nearly the full amount of fall applied N (A). Soil Nitrate in lbs. N/acre is presented for spring 2012 (C), Spring 2013 (B), and the 2 year average data (D). In 2012, Radish and Cereal Rye significantly reduced soil nitrate at the 20 inch depth when compared to the control by 57 and 87 lbs. N/acre, respectively. In 2013, Tillage Radish increased soil nitrate by 33 lbs. N/acre in the top 8 inches and was greater at the 20 inch depth relative to Cereal Rye and the control (B). When averaged over both years, Cereal Rye and Tillage Radish significantly reduced soil nitrate at the lower depths in the soil profile (D). Fall applying N into Tillage Radish resulted in 45% of soil nitrate in the top 20 inches compared to control and rye plots where only 28% and 33% of nitrate was found in the top 20 inches.

Cover Crops ARE A “WIN for:

Environment-

- Reduce soil erosion
- Reduce nitrates in tile effluent
- Reduce P loading in surface waters

Farmer-

- Reduce N loss
- Improve water infiltration
- Reduce soil compaction
- Increase soil OM



“...cover crops make farmers money by saving input costs, improving efficiency and eventually increasing crop yields.”

-James J. Hoorman, Cover Crops & Water Quality, Extension Educator, Ohio State University

Ohio Ag Manager, June 2010



Thank You!

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