Indian Creek Watershed Project

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Reetz Agronomics, LLC

2011 Annual Report Meeting
Fairbury, Illinois

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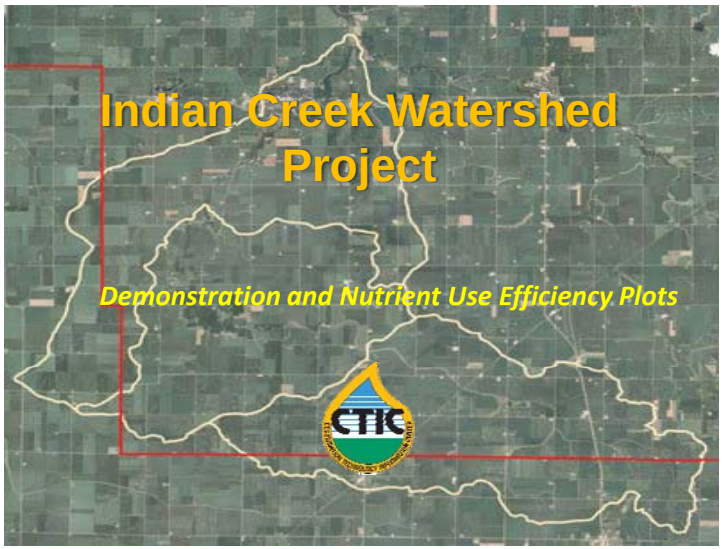


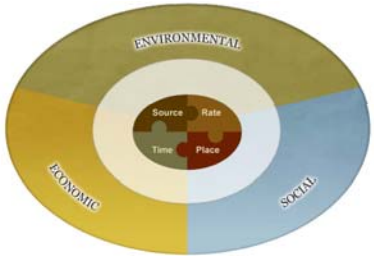
Think "Systems" Management

- **Right management**
  - Components interact for management decisions.
- "**System**" considers:
  - all component **practices**,
  - the **data** (information).
  - **Results** of the management decisions.
    - ***Agronomic*** *responses (yield)* .
    - ***Economic*** *evaluation.*
    - ***Environmenta****l consequences.*

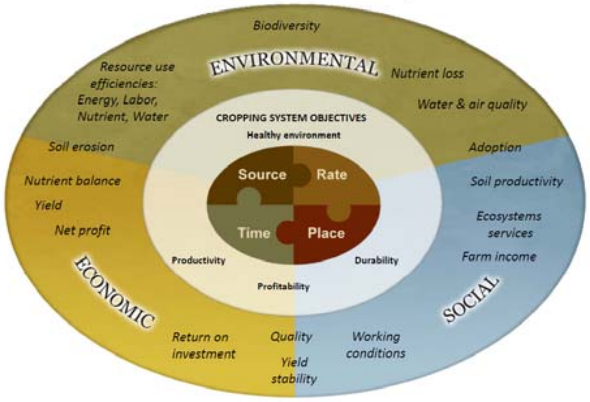
"Right" Nutrient Management

Precision farming …and the various component technologies of precision farming…are essential to "Right" management…to *the* ***4R System for Fertilizer BMPs***.

Right Source
Right Rate
Right Place
Right Time



The **Global Framework** for **4R Nutrient Management**---
---with ***Performance Indicators***

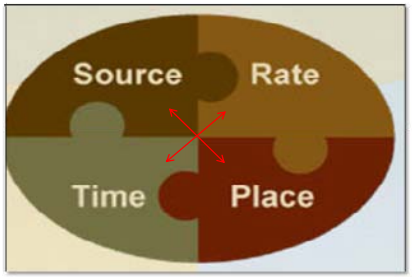


See www.ipni.net for more information

Interactions are Important

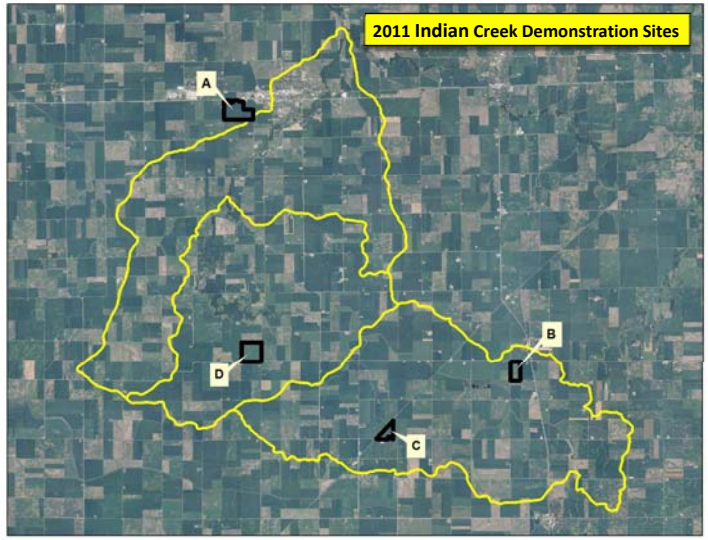
The right source, rate, time, and place are ***interdependent.***

The 4Rs interact---they **work together** for best management.



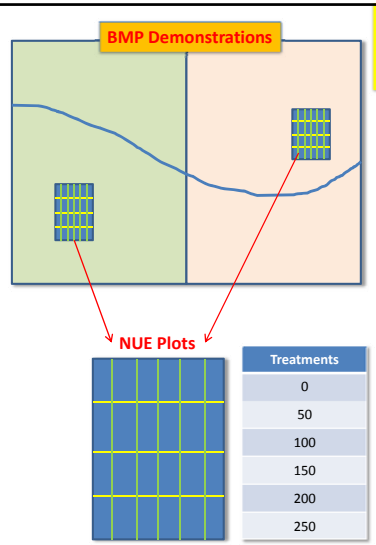
Demonstrations

- Designed to demonstrate the 4 Rs of nutrient management
  - **Right Source; Right Rate; Right Place; Right Time**
- Demonstration of **management systems**---*--not individual practices*.
- Evaluated on
  - ***agronomic yield;***
  - ***economic sustainability;***
  - ***nutrient use efficiency;***
  - ***water quality impact*.**



Demonstrations

- Field-scale plots (10-20 acres)
- Demonstrate systems of proven BMPs
- Implemented with farmer/dealer equipment
- Harvested with farmer's combine
- Used for tours and other outreach efforts



Indian Creek
WATERSHED PROJECT

BMP Demonstrations

Current Practice	BMP
No Cover crop	Cover Crop
Chisel plow	Strip till
Fall Ammonia	Spring Agrotain/Urea
Fall Ammonia	Spring ESN
ESN	ESN Split x 3

INDIAN CREEK WATERSHED PROJECT
BMP Demonstrations and Nitrogen Use Efficiency Plots

SLOW RELEASE FERTILIZER (Steffen Farm)

A controlled-release nitrogen source, such as Agrotain's SuperU (U for urea), provides potential for boosting nitrogen use efficiency. SuperU blocks the enzyme urease to prevent nitrogen loss into the air. This technology allows the crop to access the nitrogen it needs immediately, but controls losses in the first critical weeks after application. SuperU continues to protect nitrogen from losses due to denitrification and leaching, which are detriments to water quality.

This site demonstrates Super-U with a small-plot nitrogen use efficiency rate demonstration, which will help determine the most efficient rate for this location and this season.

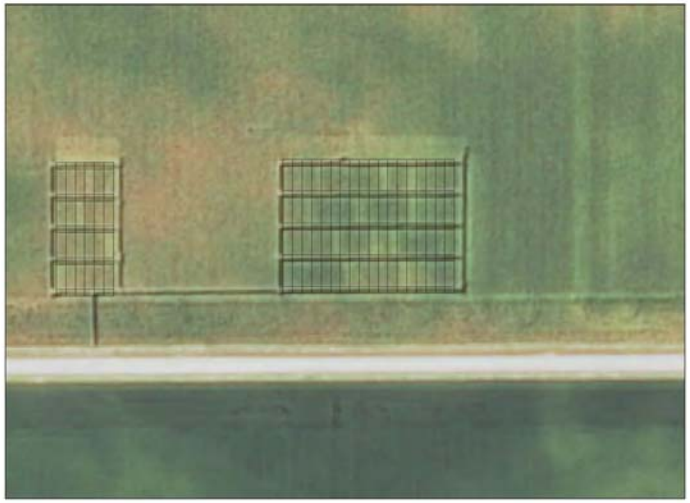
SIDEDRESS PHOSPHORUS + MICRO-ESSENTIALS (Steffen Farm)

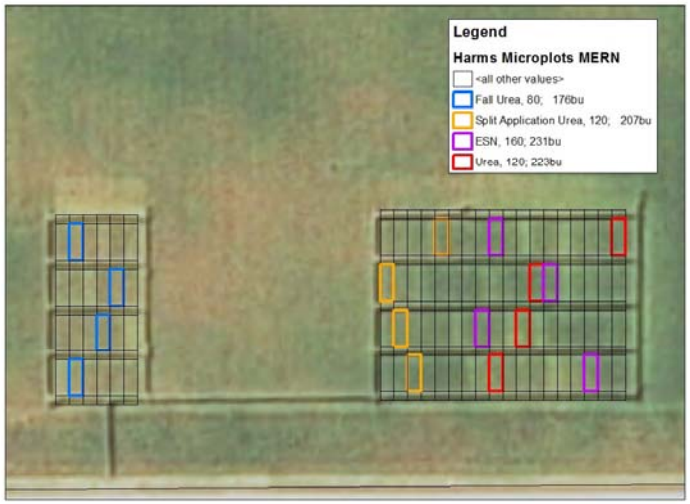
A soil test showed a relatively low phosphorus level, so we selected a demonstration of Mosaic's Micro-Essentials (MESZ) applied as a side-dress (plant nutrients placed on or in the soil near the roots of a growing crop) treatment to provide an additional boost in available phosphorus.
MESZ allows uniform nutrient distribution and provides essential nutrients crops need in one granule. It has two forms of sulfur for season-long nutrition.
It was side-dressed at two rates with a control plot where it was not applied.

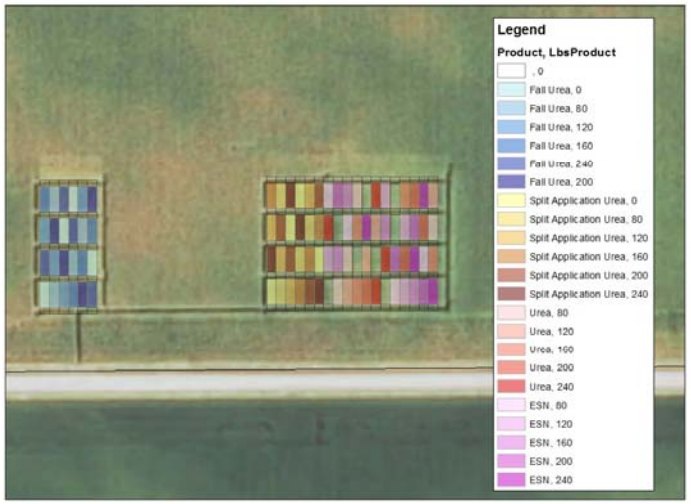
NITROGEN (N) FERTILIZER SPLIT APPLICATION (Harms Farm)

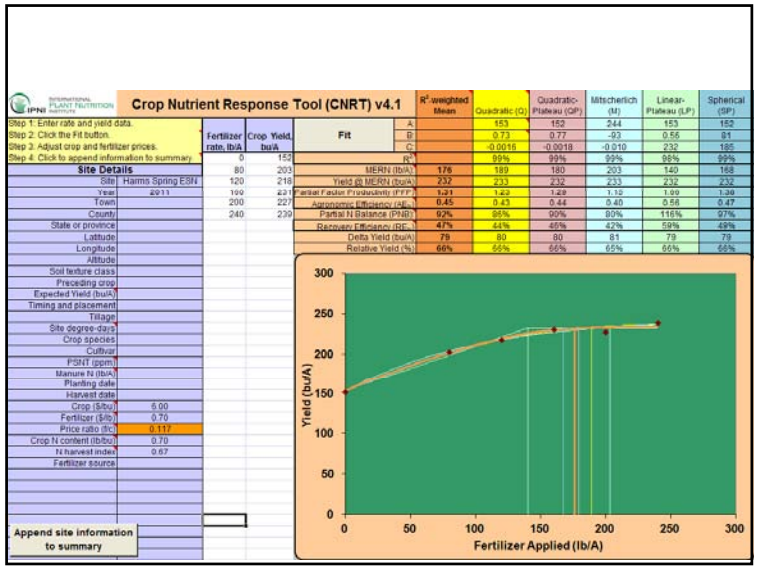
Costs of inputs make it important to provide enough N so the crop is never deficient. For greatest efficiency, N should be applied close to the time it will be used by the crop.
This demonstration compares 3 different application times:
•Fall Application
•Spring Application
•Split Application---½ applied in Fall and ½ applied in Spring

A second demonstration compares the full recommended N rate with a reduced rate (85% of recommended rate) using a controlled-release source, ESN®.
ESN® controlled-release technology delivers N to the crop all season long, not just when it's applied, allowing the crop to reach full genetic potential. The unique polymer coating helps prevent against all forms of N loss, including volatilization, denitrification and leaching. When used correctly, ESN® can substantially reduce N losses to surface water, subsurface drainage water, and groundwater, a positive impact to water quality.
Crop Production Services provided a John Deere 2510H nutrient applicator to apply fertilizer for this demonstration.







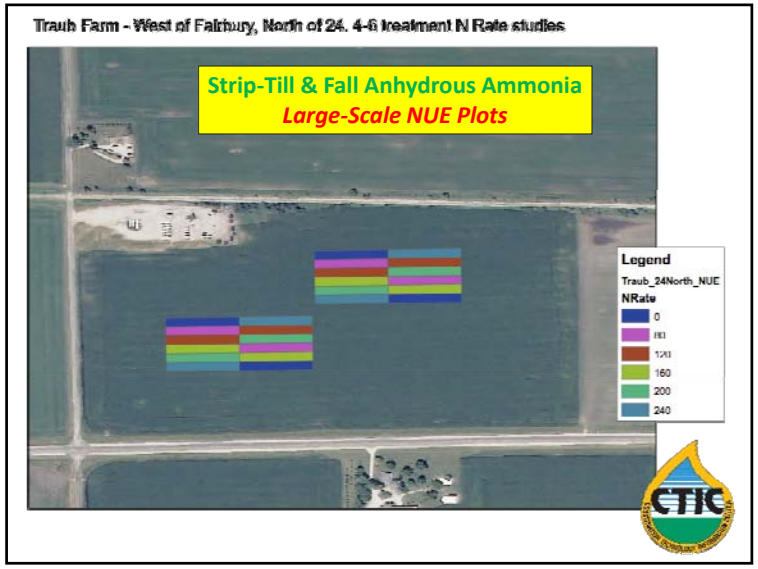


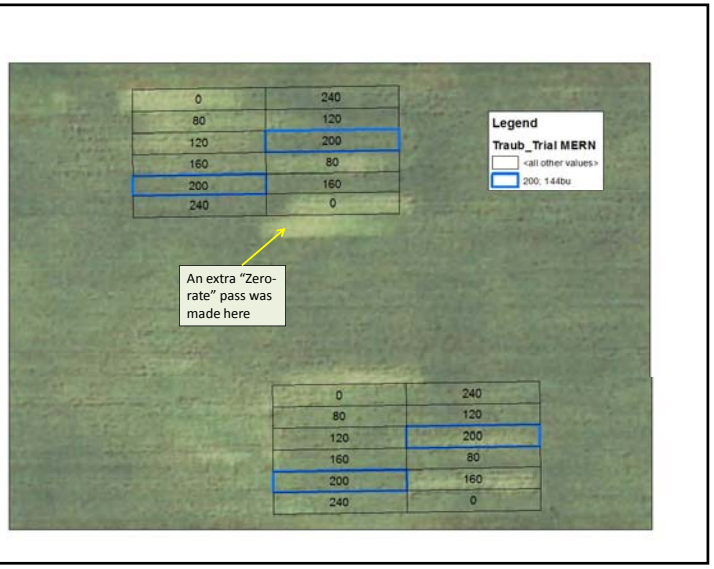
STRIP –TILL NITROGEN APPLICATION (Traub Farm)

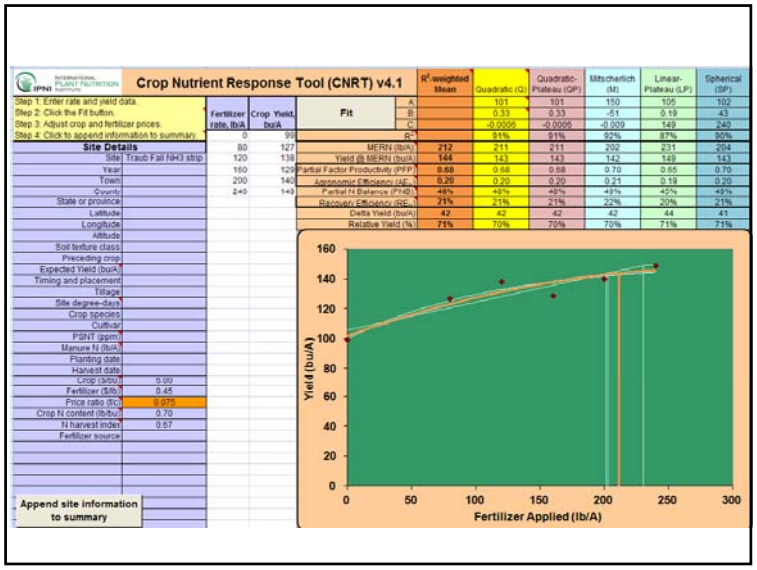
The farmer uses real-time kinematic precision guidance to apply N fertilizer in fall or early spring in a closely-controlled location relative to where the seed will be sown.

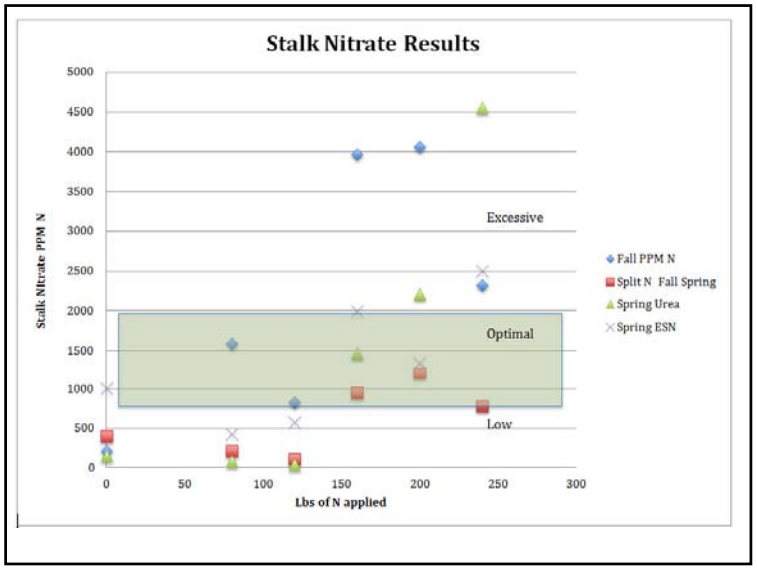
Strip-till conservation systems use minimal tillage. They combine soil drying and warming benefits of conventional tillage and soil-protecting advantages of no-till by disturbing only the portion of soil that will contain the seed row.
Here we are using fall applied N with an RTK strip-till system and comparing it to a conventional chisel plow system.

A special feature at this site is the demonstration of N use efficiency (NUE) rate comparison, done with field-scale equipment, so that the farmer can apply the rate treatments and harvest the plots with conventional equipment without interrupting his normal production routine. This demonstrates a simple approach to on-farm research that every farmer can adopt.



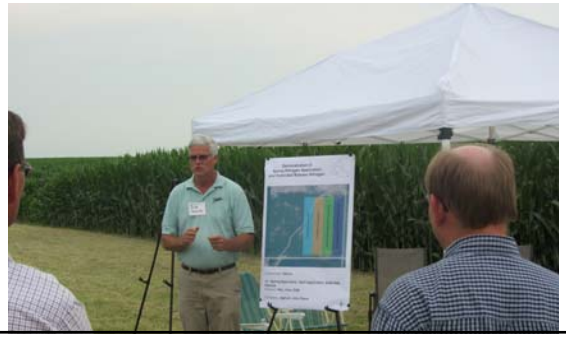






ILLINOIS SOIL NITROGEN TEST (ISNT) (Monahan Farm)

This demo will be used to demonstrate and monitor the use of the ISNT soil test as a best management practice. The ISNT test was used to determine the proper N rate for the field. Original plans to use this site to demonstrate a comparison of variable-rate N fertilizer and field-average rate of N fertilizer had to be changed due to an application error in applying the treatments. That demo will be deferred to 2012. The ISNT Test was used as a part of the background testing for all of the N demonstration fields.



2012 Variable-Rate N Demonstration

Demonstrations Planned for 2012 Growing Season

COVER CROPS (Mueller Farm)

A cover crop demonstration is planned on the John Mueller farm beginning in fall 2011. Tillage radishes and oats cover crop has been established for comparison to no cover crop. Both will be continuous corn systems.

2011-2012 Cover Crop Demonstration

John Mueller Farm

MORE ADOPTION OF IMPROVED PRACTICES

For 2012, we will encourage more farmers in the watershed to select at least one new practice to implement on their farms as part of a conservation system. The Livingston County NRCS and SWCD will work with farmers through incentive programs like the federal Conservation Stewardship Program.

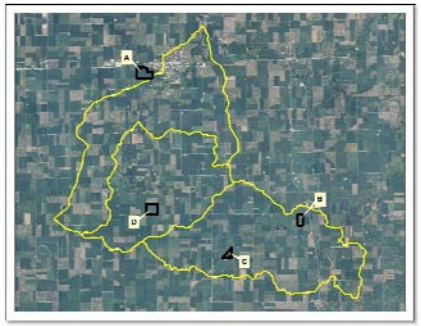
Desired practices include:

- *Soybean N credit*
- *Split N application*
- *No-till beans vs. conventional*
- *Continuous corn vs. corn silage*
- *Controlled drainage vs. tile drain*
- *Strip-till corn vs fall chisel plow*
- *Others identified and approved by the steering committee*

GIS Analysis

Various calculations and data sets are being used to do GIS analysis on the Indian Creek data.

Following are some initial examples of how these analyses can be used to extrapolate the observations on our project sites to the entire watershed based on identifying fields of similar soil types, topography, crop rotation, etc.



Acres Summary for Indian Creek Watershed

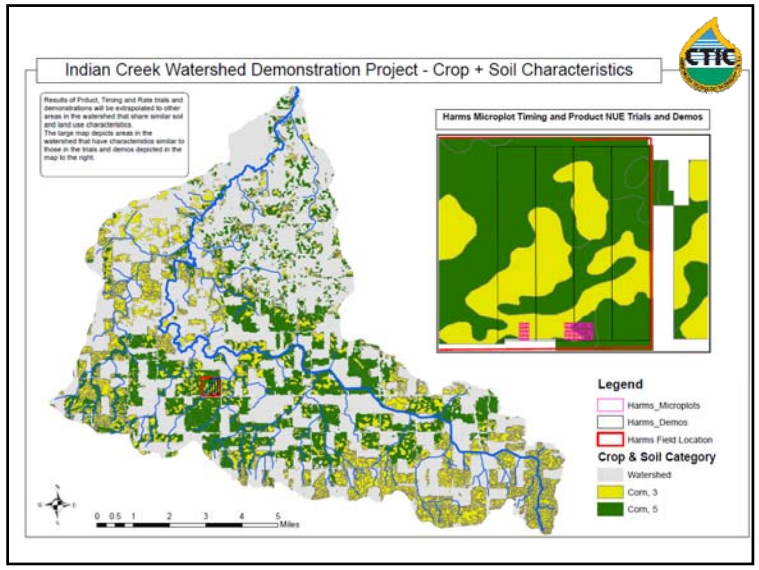
Based on the Cropland Data Layer for 2009
(2011 not yet available)

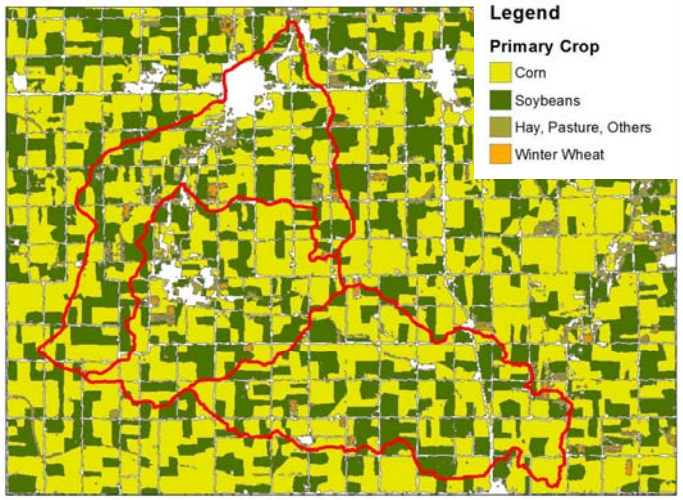
PI Index Classes:
Class 3 = PI 0 - 112
Class 4 = PI 113 - 116
Class 5 = PI 117 - 126

Total Corn/Soybean Acres = 43,715
Corn/Soybean P I3 = 20,427 Acres
Corn/Soybean PI 4 = 6,254
Corn/Soybean PI 5 = 17,034

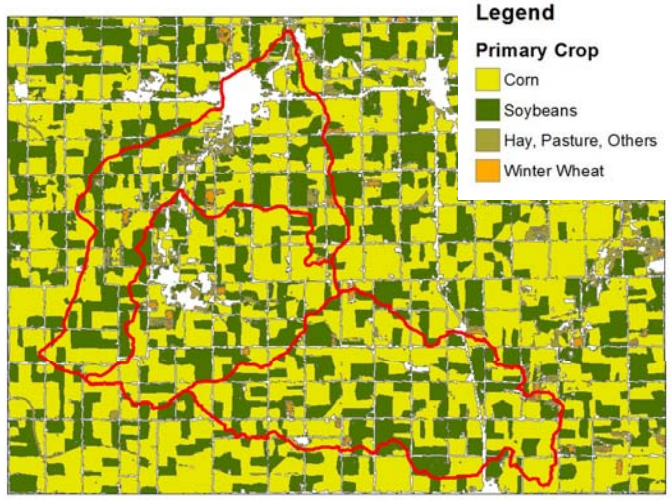
Total Soybean Acres = 16,313
Soybeans with PI 3 = 7,519 Acres
Soybeans with PI 4 = 2,364
Soybeans with PI 5 = 6,430

Total Corn Acres = 27,402
Corn with PI 3 = 12,908 Acres
Corn with PI 4 = 3,890
Corn with PI 5 = 10,604

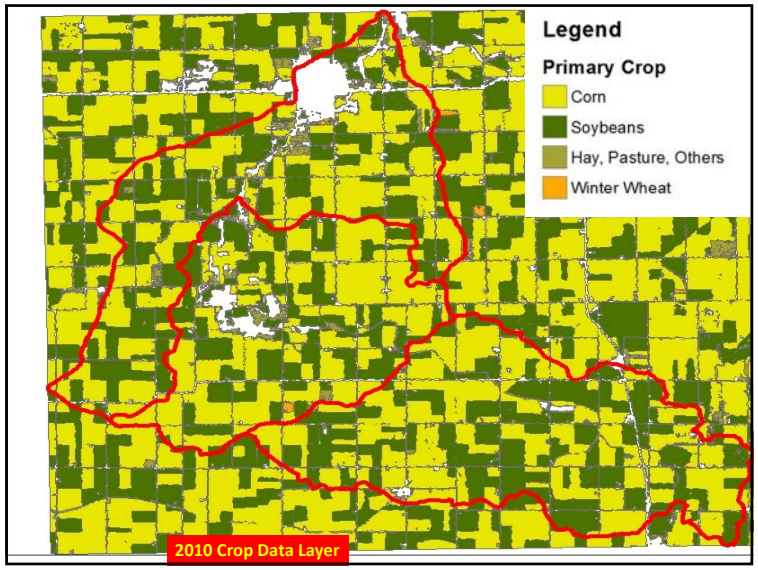




2008 Crop Data Layer



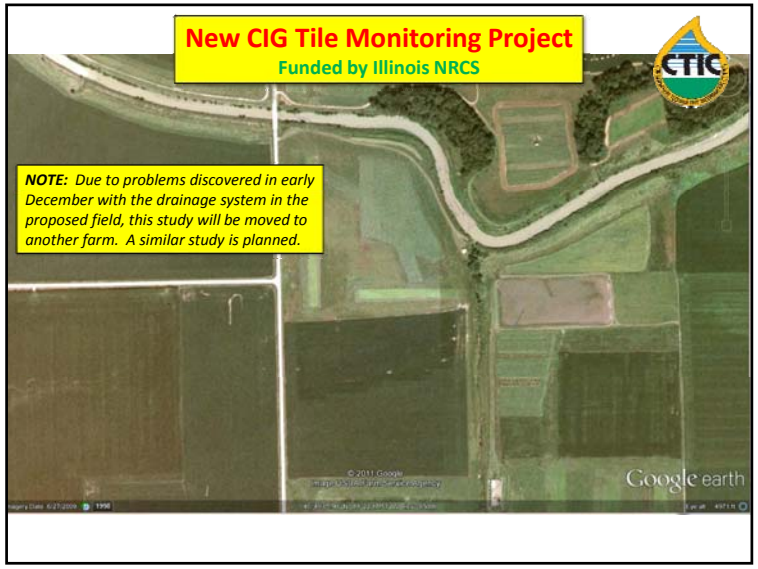
2009 Crop Data Layer

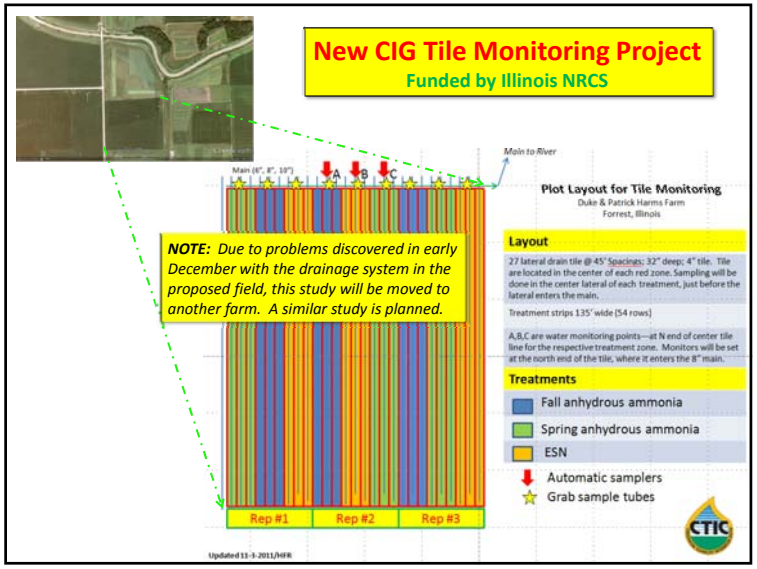


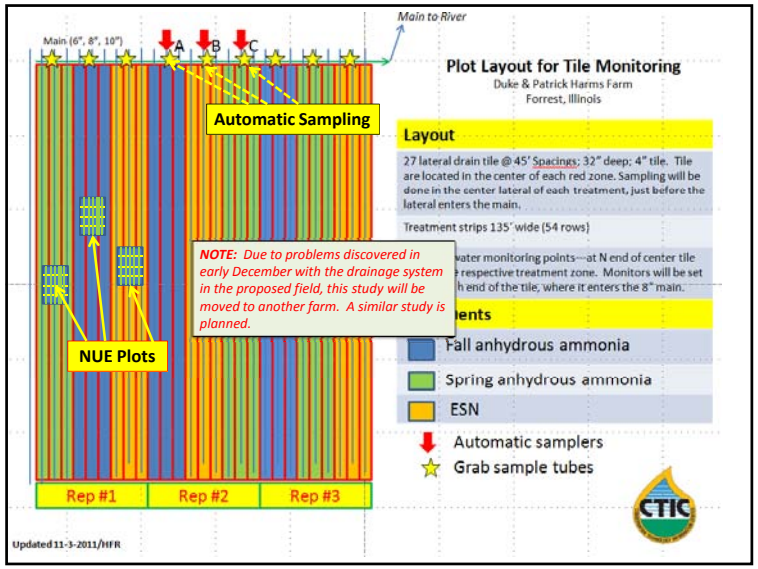
TILE OUTLET MONITORING (funded by Illinois USDA Conservation Innovation Grant Project)

A complementary program will fund some tile monitoring and N management demonstrations in a neighboring watershed on the Duke Harms farm. This involves retrofitting an existing pattern-tiled 35-acre field with drainage monitoring and sampling equipment and sampling throughout the year (2011-2013) for nitrate, phosphate, etc. The demonstration will compare fall anhydrous ammonia, spring anhydrous ammonia, and ESN as the N source.

NOTE: *Due to problems discovered in early December with the drainage system in the proposed field, this study will be moved to another farm. A similar study is planned.*







Thank you!

Websites for more information

www.ReetzAgronomics.com
www.infoag.org

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