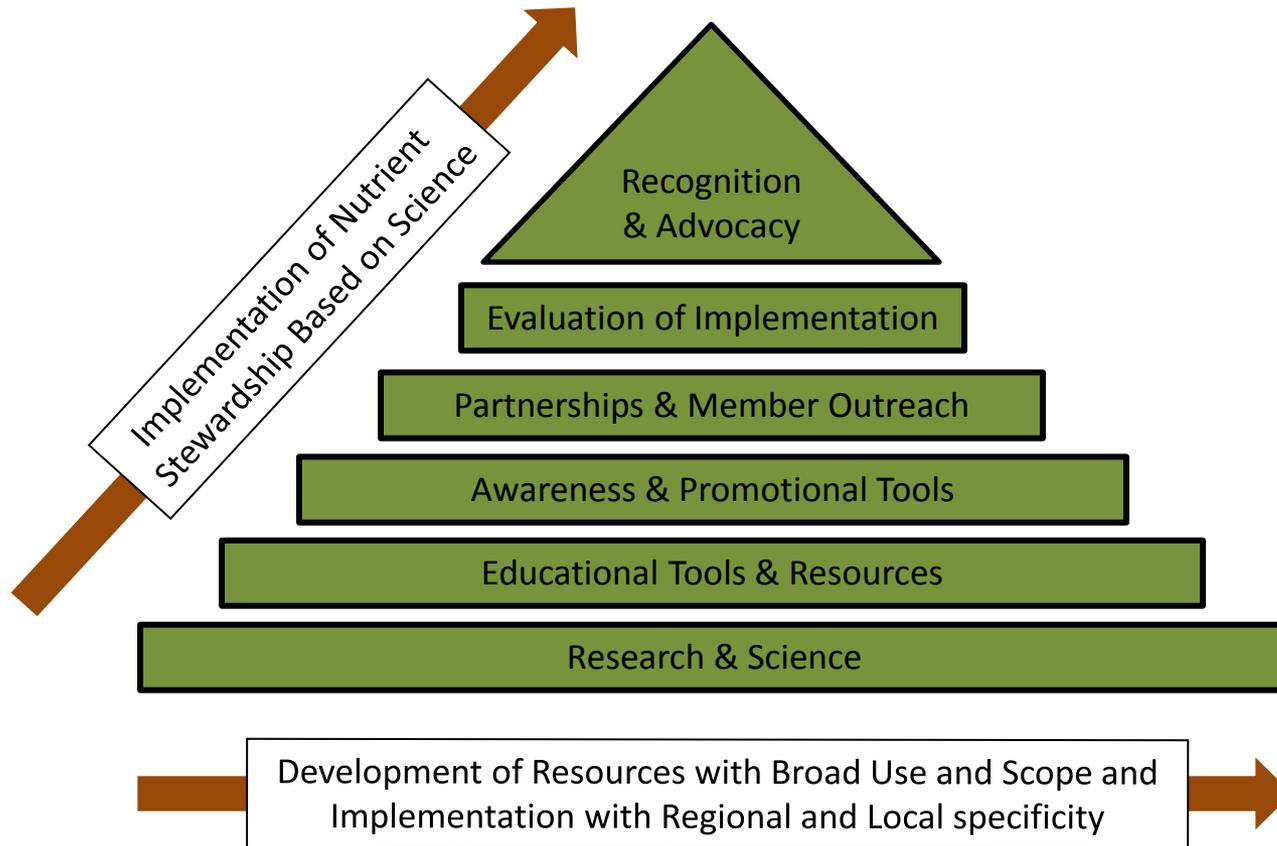


4R Nutrient Stewardship:

Ohio Lake Erie Phosphorous Task Force Phase II
Meeting Presentation
March 14, 2013

John Oster – Morral Companies, LLC

Industry Efforts



Goals:

- Establish 4Rs as recognizable strategy for economic, social, and environmental sustainability
- Expand the implementation of 4Rs by service providers on the farm
- Increase awareness of these efforts to the public and policy developers worldwide

Ohio – Industry Involvement

- Participated in state meetings
- Provided outreach at expos and meetings
- Actively encouraging producers to use the 4Rs
- Supporting research needs
- Developing 4R service provided recognition program

KEEP PHOSPHORUS IN YOUR FIELD

THE ISSUE



An aerial photo of a Lake Erie algal bloom on August 19, 2011.
Source: www.gliet.noaa.gov/iris/Carleton/HABS/newsitem_lake_erie

Historically, commercial fertilizer phosphorus was considered immobile on or in the soil. However, new data suggests fertilizer phosphorus left on the surface when followed by heavy rainfall can also be a major source of phosphorus loading. Research suggests current agricultural practices within the Western Lake Erie Basin contribute to the growing algal crisis, with more than 50 percent of the phosphorus load potentially attributed to agriculture.

There is no *single* practice to solve the problem. *Each farm has different circumstances such as soil type, surface drainage, tile drainage, soil test levels, and tillage programs, which can be modified to make a difference. Farmers can play a critical role in reducing the algal blooms in Lake Erie and we all need to do our part.*

SUGGESTED PRACTICES TO REDUCE PHOSPHORUS TRANSPORTATION INTO LAKE ERIE

- Inject or incorporate phosphorus when ever possible.
- For low-lying fields that are prone to flooding, delay application to just before planting, and either incorporate, band-place, or inject.
- Avoid spreading phosphorus near tile stand pipes or surface drains.
- Utilize cover crops to improve soil health and increase water holding capacity thereby reducing surface run-off.
- Include starter phosphorus or row fertilizer phosphorus where ever practical.
- Schedule phosphorus broadcast applications when shallow tillage is possible for conventional/reduced tillage programs.
- Schedule phosphorus applications for no-till programs as close to crop utilization as practical.
- Do not schedule phosphorus applications just prior to heavy rainfall.
- Do not schedule phosphorus applications when soils are frozen during mid-winter.
- Do not schedule phosphorus applications when soils are snow covered.
- Soil test to determine nutrient requirements for the next crop.
- Keep fertilizer phosphorus out of ditches, streams and waterways while making application.
- Consider all nutrient sources available to the crop when deciding on how much to apply.

NRCS - 4Rs in 590 Standard

- NRCS incorporated 4Rs in the revised 590 Nutrient Mgmt. conservation practice standard
- 590 Std. an important NRCS tool
- Used to help farmers apply nutrients more efficiently
- With 590 as base, NRCS will continue to provide voluntary technical and financial assistance to producers for planning and implementing on-farm nutrient management plans



You are here: [Home](#) / [Land Use](#) / [Cropland](#) / Nutrient & Pest Management

Nutrient & Pest Management

Nutrient Management Definition

Nutrient Management is defined as the management of the 4R's of Nutrient Management:

- ▶ **Right amount** (rate)
- ▶ **Right source**
- ▶ **Right placement** (method of application)
- ▶ **Right timing** of commercial fertilizers, manure, soil amendments, and organic by-products to agricultural landscapes as a source of plant nutrients while protecting local air, soil and water quality.



The corner stone for Nutrient Management is the Natural Resources Conservation Service (NRCS) **590 Nutrient Management Conservation Practice Standard**. Contact John Davis via phone at  202-720-2308 , or email j.russell.davis@wdc.usda.gov

In addition to the 590 Nutrient Management Standard, NRCS provides further guidance on the application of nutrient management via the **National Nutrient Management Policy** and **National Instruction**.

Top 10 Reasons the 4Rs are Right for You

1. Implementing the 4Rs with your grower creates a strong link
2. Grid/zone soil sampling and mapping puts the data in your hands not the hands of your competition
3. When growers see you recommend reduced rates on high-nutrient areas they understand you will sacrifice volume and sales to help achieve maximum economic yields
4. Voluntary compliance using 4Rs is vastly preferable to mandatory compliance
5. Early adoption differentiates you from your competition
6. Definite advantage to being a leader and not a follower
7. Fulfills our duty to protect the industry that sustains us
8. 4R-related services create grower loyalty
9. Access to data improves fertilizer buying and logistical decision making while reducing organizational risks
10. Access to data improves recommendations and allows us to keep pace with changing hybrids, varieties and tillage practices

Current and Upcoming Education Tools

- NRCS 4R/590 On-line Learning Modules
 - Materials developed with ISU, IPNI, NRCS and TFI
 - Addresses major and minor nutrients and provides info on BMPs relative to each
 - Will be available for free in early spring 2013
- CCA Webinar Series based on IPNI Manual
 - 1st webinar series complete
 - 2nd offering January 24th – March 15th (ends tomorrow)
 - TFI and IPNI sponsoring participation of extension staff

Awareness & Promotional Materials

- Co-branding of print, on-line and radio advertising
- Co-branding of educational flyers and brochures
- Participation in expos and conferences
- Utilizing regional and national engagements



Engagement and Outreach

- Expand your 4R knowledge with available tools
- Be a 4R advocate at local watershed and state meetings
- Engage with the NRCS state technical committee and explore opportunities for using the 4Rs within the 590 standard, consider involvement with your conservation district
- Increase implementation of 4Rs on the farm by broadening suites of practices and services offered or promoted
- Educate other stakeholder groups about 4R nutrient stewardship and encourage their engagement
- Provide input when input from agriculture is sought

Summary

- Why is 4R important?

We are blessed with the earth's richest farmland and best climate. As these resources are fully and constantly utilized to feed a huge and growing world need for food and fiber, we must increase production and maximize yields WITHOUT doing harm to our vital natural resources. 4R compliance assures this.

- What does 4R do to or for the stakeholder?

It links the producer/supplier stakeholder with the grower as never before, adding value and linkage to the supply chain. It initially differentiates adopters from their competition and creates significant pressure on others to comply.

Summary

(Continued)

- How does 4R affect the farmer?

It provides him a resource to verify his compliance with Best Management Practices on his farm. It helps him to continue to develop and refine his land and crop management skills. With all things in balance, it assures maximum economic yields with minimum land disturbance and minimal environmental impact.

- How will 4R improve the situation?

Full adoption will remove the necessity of overly-burdensome governmental oversight, proving, once again, that the American Farmer is the very best steward of the land and waters of this great State, and Nation.

Summary (Continued)

- What we hope to accomplish by promoting 4R?
Universal adoption and adherence to the 4R Nutrient Stewardship program should be the ultimate goal. We want to see Ohio lead the way for other states and, ultimately, other nations. We want to return to a time when Farmer was a word describing a way of life that embodies all that is good and right about humanity. Those worthy of the title FARMER fulfill a high calling by improving the lives of countless others who are unable to feed and clothe themselves. We are blessed to be a part of that process and obligated to do our part to assure its continued success.

4R Dealer Certification Project

1. 4R Nutrient Stewardship
2. Example of typical “Precision Ag Program”
3. 4R Benefits to all stakeholders
4. 4R Certification Advisory Committee
5. Why 4R Dealer Certification
6. What does the program look like
7. Program support short and long term
8. How can you help



4R Certification Advisory Committee

- Larry Antosch (Ohio Farm Bureau)
- Doug Busdeker (The Andersons)
- Gary Pennell , (EDF/Farmers Cooperative)
- Mindy Bankey (Ohio SWCD)
- Larry Clemens (The Nature Conservancy)
- Greg LaBarge (OSU Extension)
- Ed Crawford (Conservation Action Project),
- Matt Atkins (Ohio Dept. of Nat. Res.),
- Denise Franz King (Ohio Dept. of Ag.)
- Jim Lake (Indiana State Dept. of Ag.)
- Tina Lust (Channel Bio Corporation, Ohio CCA Board Chair)
- Joe Nester (Nester Ag, LLC)
- Sarah Orlando (Lake Erie Clean Marinas)
- John Oster (Morral Companies)
- Bill Stanley (The Nature Conservancy)
- Mark Sunderman (Deshler Farmers Elevator – OABA Board Vice President)
- Carrie Vollmer-Sanders (The Nature Conservancy)
- Kevin Elder for Denise Franz King (Ohio Department of Agriculture)



Why 4R Dealer Certification

- ✓ Purpose - provide guidance and direction for a consistent, recognized program for the agricultural community that ensures social, environmental and economic 4R nutrient sustainability goals.
- ✓ Implementation - leads to long term positive impacts on water quality in the Western Lake Erie Basin.
- ✓ Target audience - CCAs, agricultural retailers, crop advisors, and service providers.

4R Nutrient Stewardship

- ▶ **Right Source, Right Rate, Right Time & Right Place**



4R's is a management strategy !!

Proposed Structure to Achieve 4R Consistency

- ✓ **Education**
- ✓ **Record Keeping**
- ✓ **Assessment**
- ✓ **Federal/State Laws Followed**
- ✓ **Annual Review**
- ✓ **Private, 3rd party validation**



Name of Service Provider: _____

Total Acres for Nutrient Recommendations: _____

Made by Third-Party Professional* _____

Made by Other (not 3rd Party Professional): _____

Reviewed by Service Provider:

Certified Professional* on Contract or on Staff: _____

Not by Certified Professional On Contract or on Staff: _____

Total Acres Applied with Nutrients: _____

All sales, nutrient and application staff are trained in 4R Nutrient Stewardship.

Manager Signature: _____

All growers have indicated they understand their farm's nutrient recommendations. Manager Signature: _____

All nutrient application equipment is calibrated annually to ensure proper application. Manager Signature: _____

N-P-K Nutrient Recommendations		Total Acres	% of Business	Goal
Rate	Soil tests were conducted within the last 2-3 years to determine nutrient requirements for the next crop.			100%
Rate	Soil tests were from representative acres of 25 acres or smaller.			100%
Rate	Geo referenced soil tests were conducted.			50%
Rate	Yield goals are established based on previous yields achieved, soil potential and level of crop management.			100%
Rate	Recommendations are consistent with the Tri-State Fertilizer Guidelines (at or below) based on soil test results from most recent soil test.			100%
Rate	Monitor soil test levels and crops yield trends to evaluate yield and soil health goals.			100%
Rate	Soil test levels are not built past maintenance limit.			100%
Rate	Crop nutrient balances are calculated.			100%
Source	All sources of nutrients are accounted for in the nutrient management recommendation including manure (book value or actual test), Biosolids, cover crops, etc.			100%
Place	Nutrient application recommendations are consistent with setback to all water resources according to state regulations/laws including a 150' setback from tile inlets/surface drains.			100%
Time	It is recommended that Nitrogen and Phosphorus are not applied on frozen*** ground and must be incorporated on snow covered ground.			100%

N-P-K Nutrient Application

N-P-K Nutrient Application		Total Acres	% of Business	Baseline
Rate	Including all forms of nutrients, there was not more than a 2-year application rate made.			75%
Rate	Application is consistent with the Tri-State Fertilizer Guidelines (at or below) based on soil test results from most recent soil test.			100%
Place	Nutrients are applied taking into account setbacks to all water resources according to state regulations/law.			100%
Place	Nutrients are not surface applied without incorporation within 150' of a tile stand pipe or surface drainage unless there is a growing crop**.			100%
Place	Phosphorus nutrients are applied to a growing crop or cover crop OR it is injected, banded or (recommended to the farmer to) lightly till the top 1-3 inches of the soil using an implement that incorporates the fertilizer but does not impact the soil structure below 3 inches.			75%
Place	Variable Rate Technology was used to apply nutrients according to geo referenced soil samples.			50%
Timing	Anhydrous Ammonia is not applied in the fall unless it is applied with a stabilizer.			100%
Timing	Nutrients are not surface applied prior to heavy rainfall (50% chance of more than ½ inch rainfall within 24 hours).			100%
Timing	Nitrogen and Phosphorus are not applied on frozen*** ground and must be incorporated on snow covered ground.			100%



THE ANDERSONS
NCO FARM CENTERS

What comprises our Precision Ag Program

GPS soil sampling by management zones

Variable rate application of Fertilizer and Lime

Evaluation of yield maps (& calibrating yield monitors)

Working with grower on variable rate seeding

Using NDVI (Normalized Difference Vegetative Index) Maps

Consulting with grower on all aspects production

How are Management Zones Determined

Soil Type Map

Yield Map Data

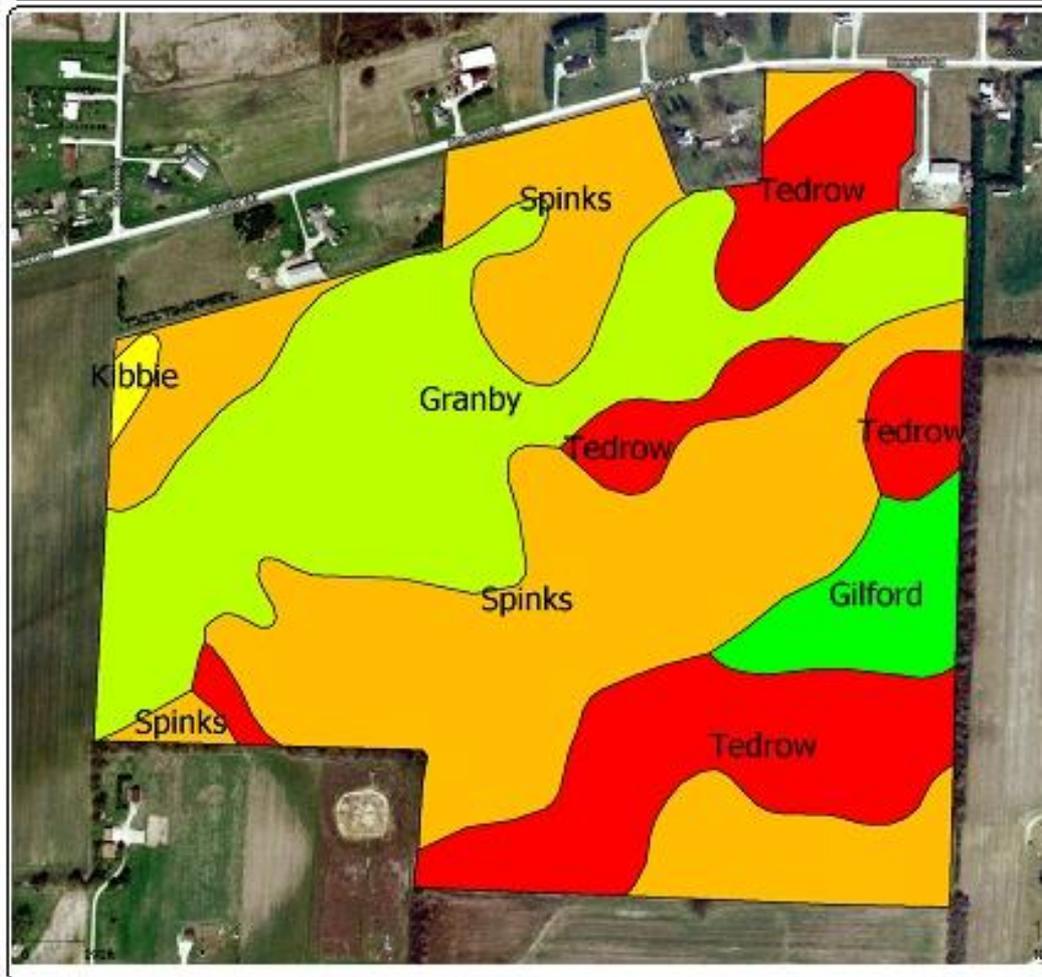
Aerial Photos

NDVI maps

Veris Data

Manually layout of zones

Soil Survey #96



DATE: 1/19/16
BY: [illegible]
[illegible]
[illegible]
[illegible]

Soil Type	
Gilford	(6.14 ac - 5.0%)
Granby	(35.47 ac - 28.9%)
Kibbie	(0.68 ac - 0.6%)
Spinks	(52.79 ac - 43.0%)
Tedrow	(27.65 ac - 22.5%)



Generic1 #96

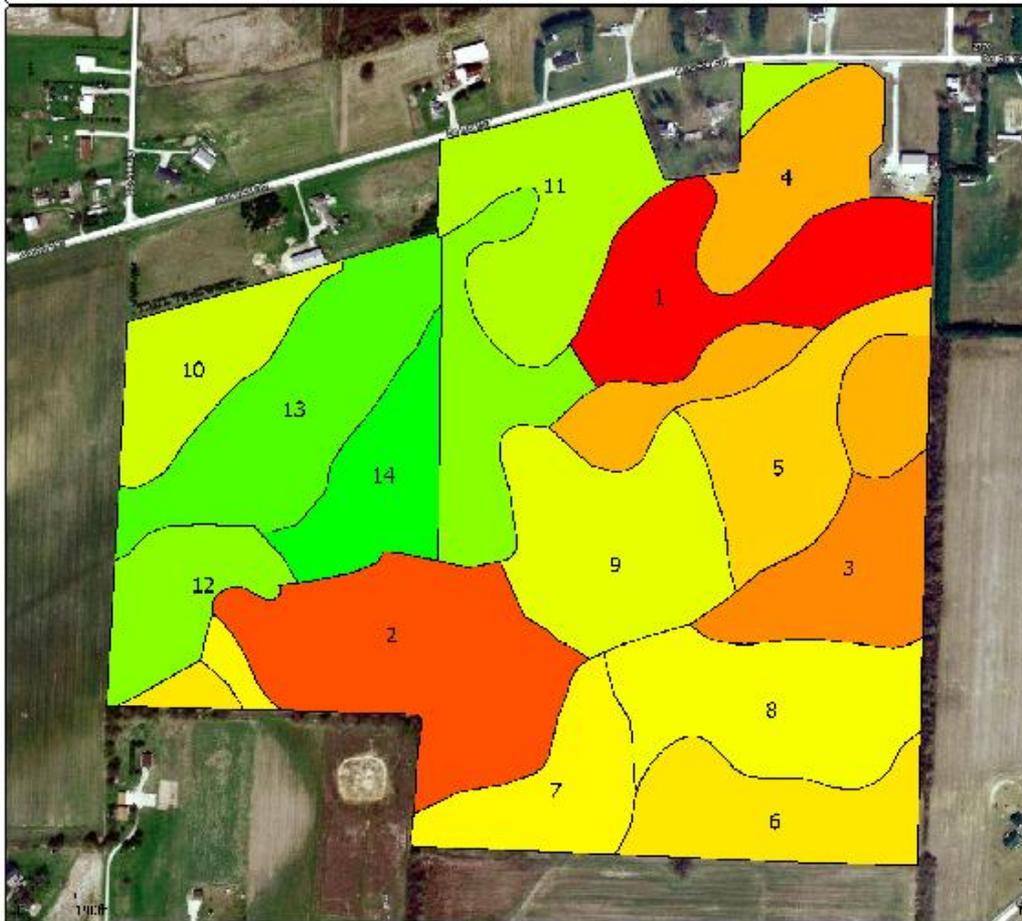


Field : #96
Year : NO Year
Operation : Generic1
Crop / Product : NO PRODUCT
Op. Instance : Sampling Zones
Area : 122.42 ac

Profile ID	
14.000	< 5.51 ac
13.000	< 10.49 ac
12.000	< 11.04 ac
11.000	< 9.86 ac
10.000	< 5.23 ac
9.000	< 9.87 ac
8.000	< 9.35 ac
7.000	< 6.09 ac
6.000	< 7.41 ac
5.000	< 7.20 ac
4.000	< 12.05 ac
3.000	< 6.09 ac
2.000	< 13.11 ac
1.000	< 9.46 ac



Generic1 #96

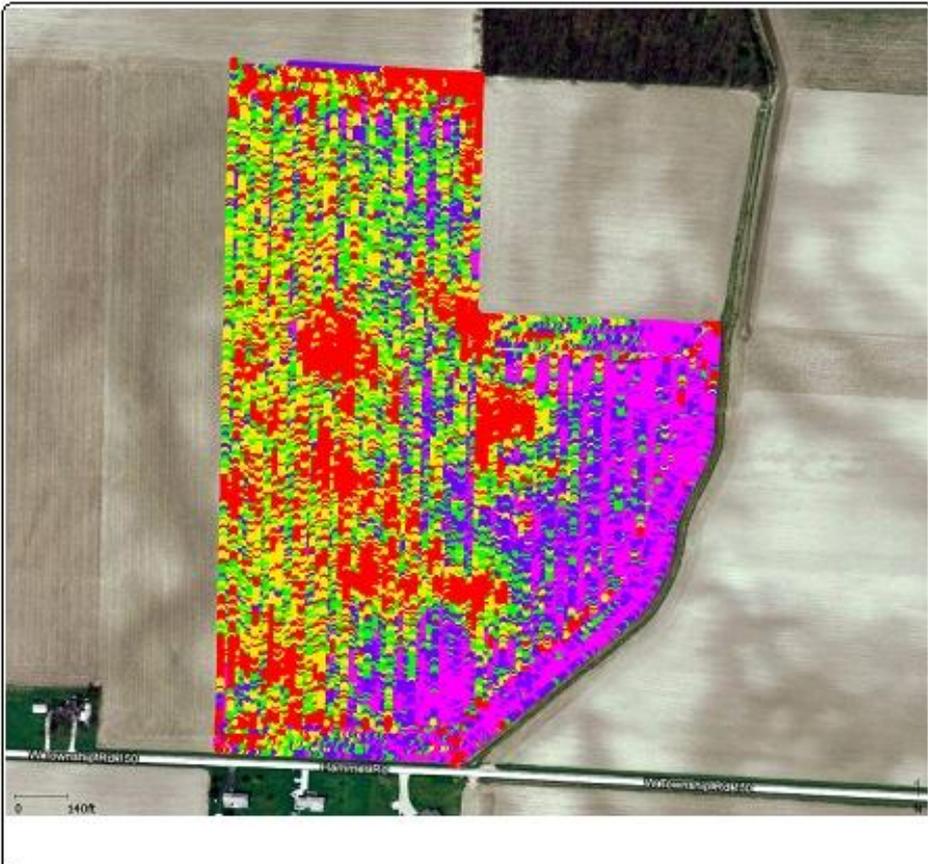


Farm : ZJ - Druckenmiller
Field : #96
Year : NO Year
Operation : Generic1
Crop / Product : NO PRODUCT
Op. Instance : Sampling Zones
Area : 122.42 ac
Length : 49,886 ft
Count : 14

Feature ID	Area (ac)
14.000	(5.51 ac)
13.000	(10.49 ac)
12.000	(11.04 ac)
11.000	(9.86 ac)
10.000	(5.23 ac)
9.000	(9.87 ac)
8.000	(9.35 ac)
7.000	(6.09 ac)
6.000	(7.41 ac)
5.000	(7.20 ac)
4.000	(12.05 ac)
3.000	(6.09 ac)
2.000	(13.11 ac)
1.000	(9.46 ac)

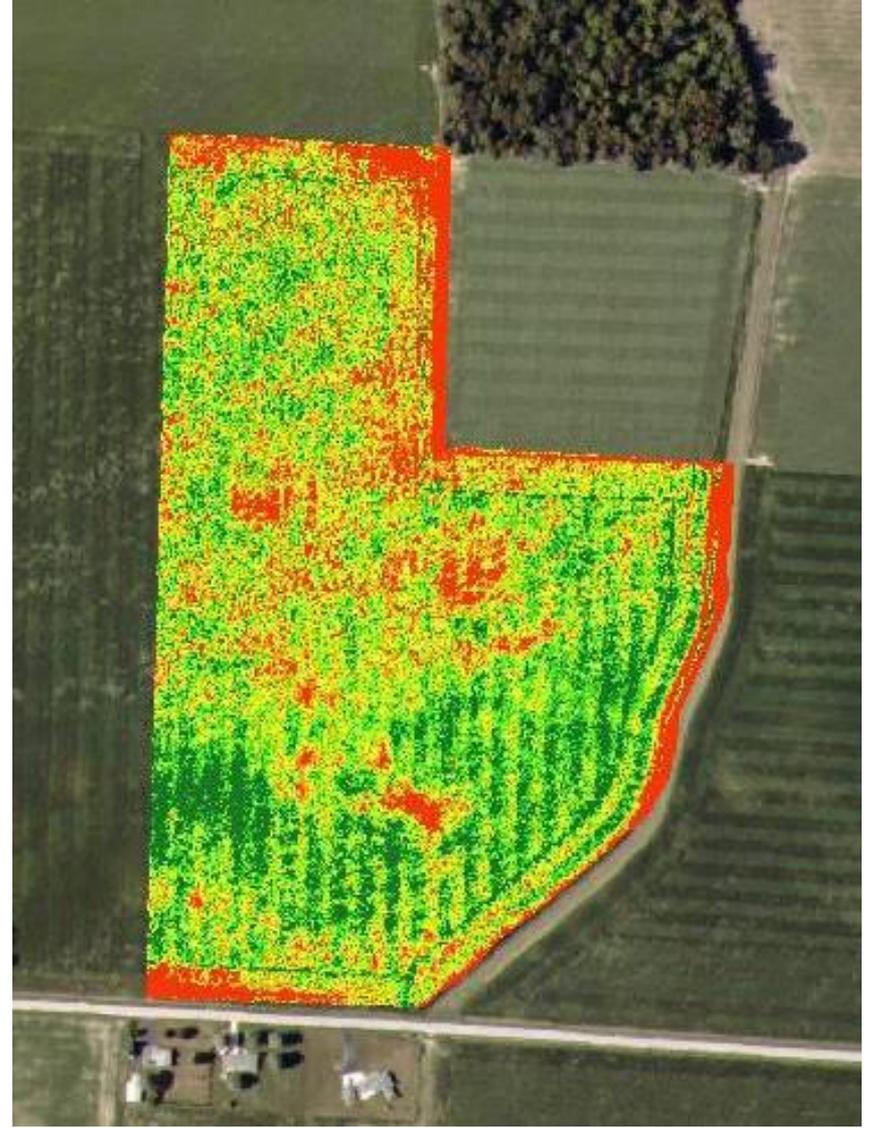


Grain Harvest 2012 - #56



Field : #56
 Year : 2012
 Operation : Grain Harvest
 Crop / Product : Multiple
 Op. Instance : Harvest - 1
 Area : 43.88 ac
 Avg. Yield : 199.75 bu/ac
 Avg. Moisture : 20.53 %

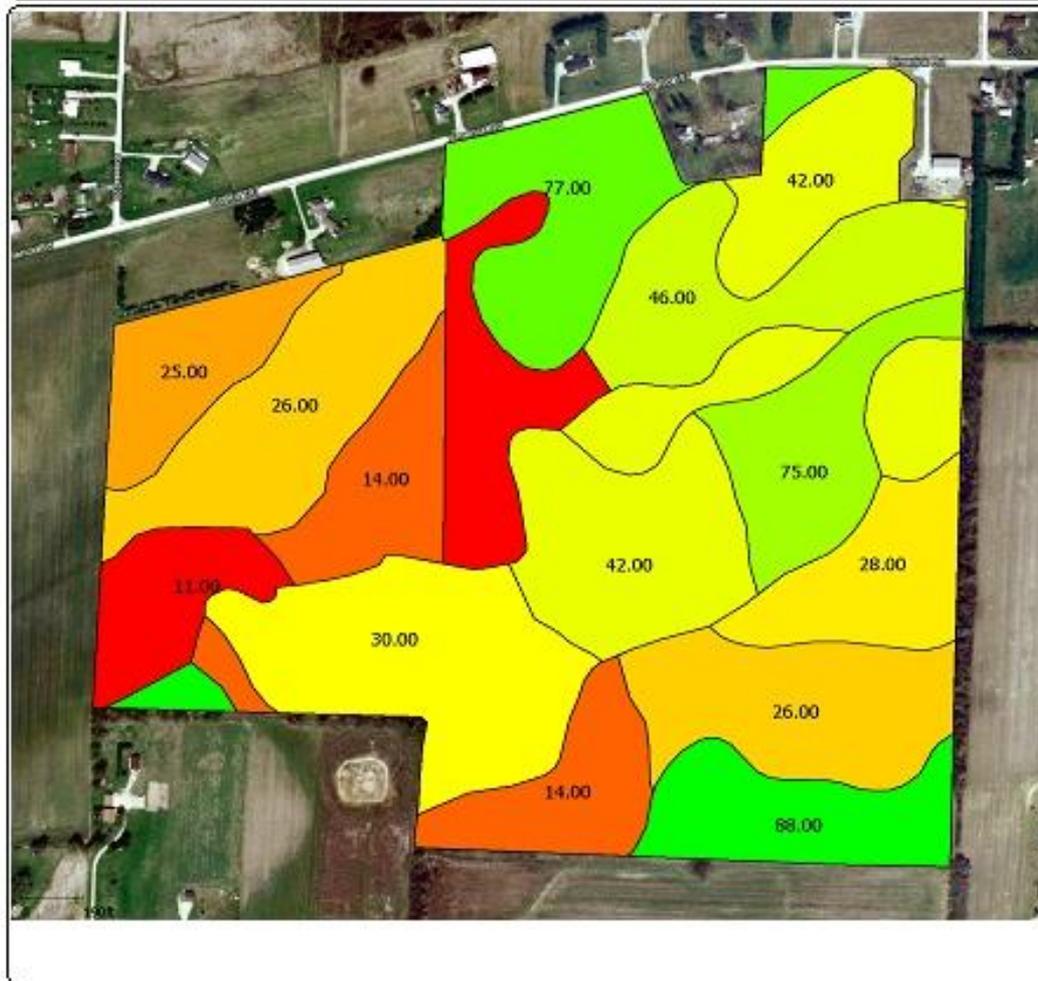
Estimated Volume (Dry) (bu/ac)		
■	226.67 - 1,746.10	(7.329 ac)
■	205.19 - 226.67	(8.620 ac)
■	191.25 - 205.19	(9.132 ac)
■	177.18 - 191.25	(9.454 ac)
■	5.07 - 177.18	(9.340 ac)



NDVI map Normalized Difference Vegetation Index

NDVI mapping is another way to assess plant health and determine actions to improve yield.

Soil Sampling 2013 - #96



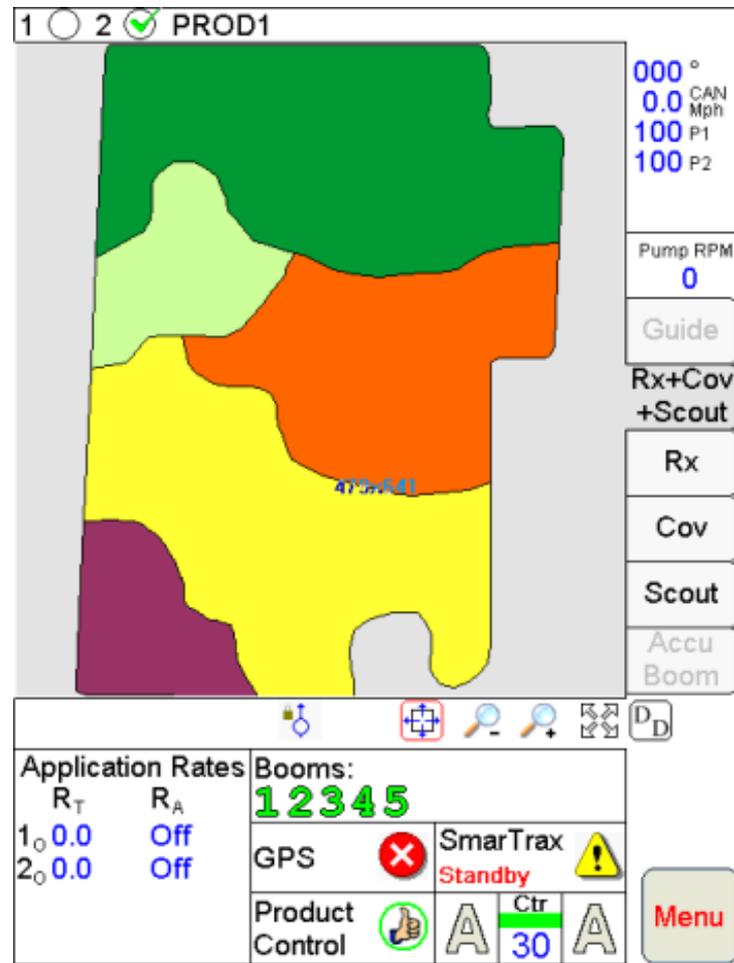
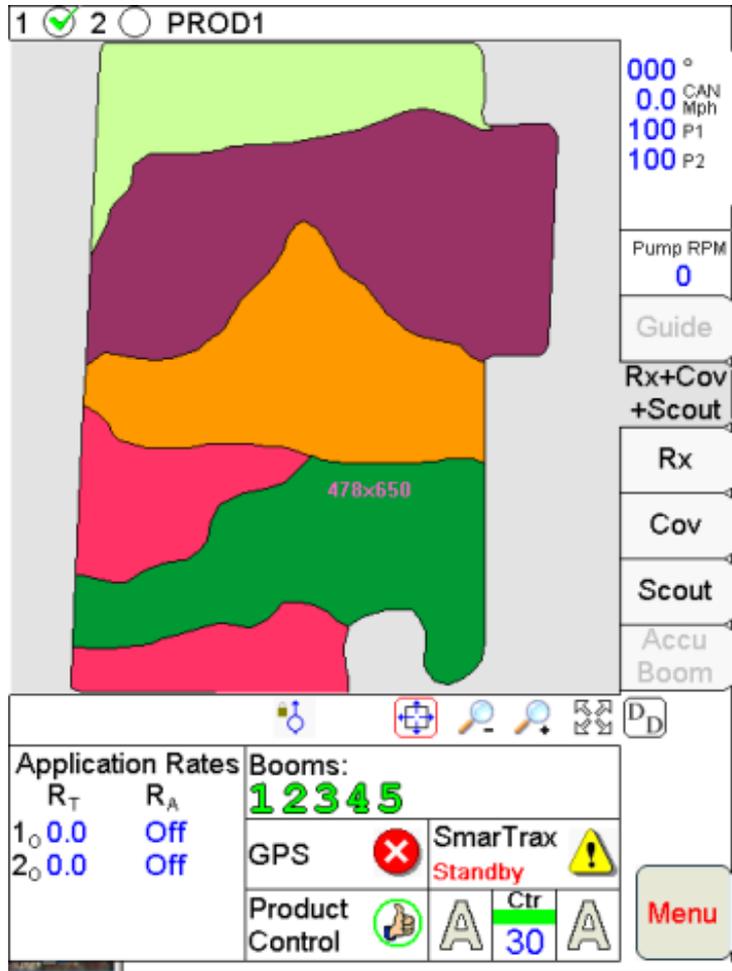
Field : #96
 Year : 2013
 Operation : Soil Sampling
 Crop / Product : NO PRODUCT
 Op. Instance : Sampling - 1
 Avg. Soil OM : 2.244 %
 Avg. Soil P1 : 39.11 ppm
 Avg. Soil K : 100.65 ppm
 Avg. Soil CA : 758.63 ppm
 Avg. Soil pH : 6.875 (°)
 Avg. Soil CEC : 5.490 meq/100g

Soil P1 (ppm)

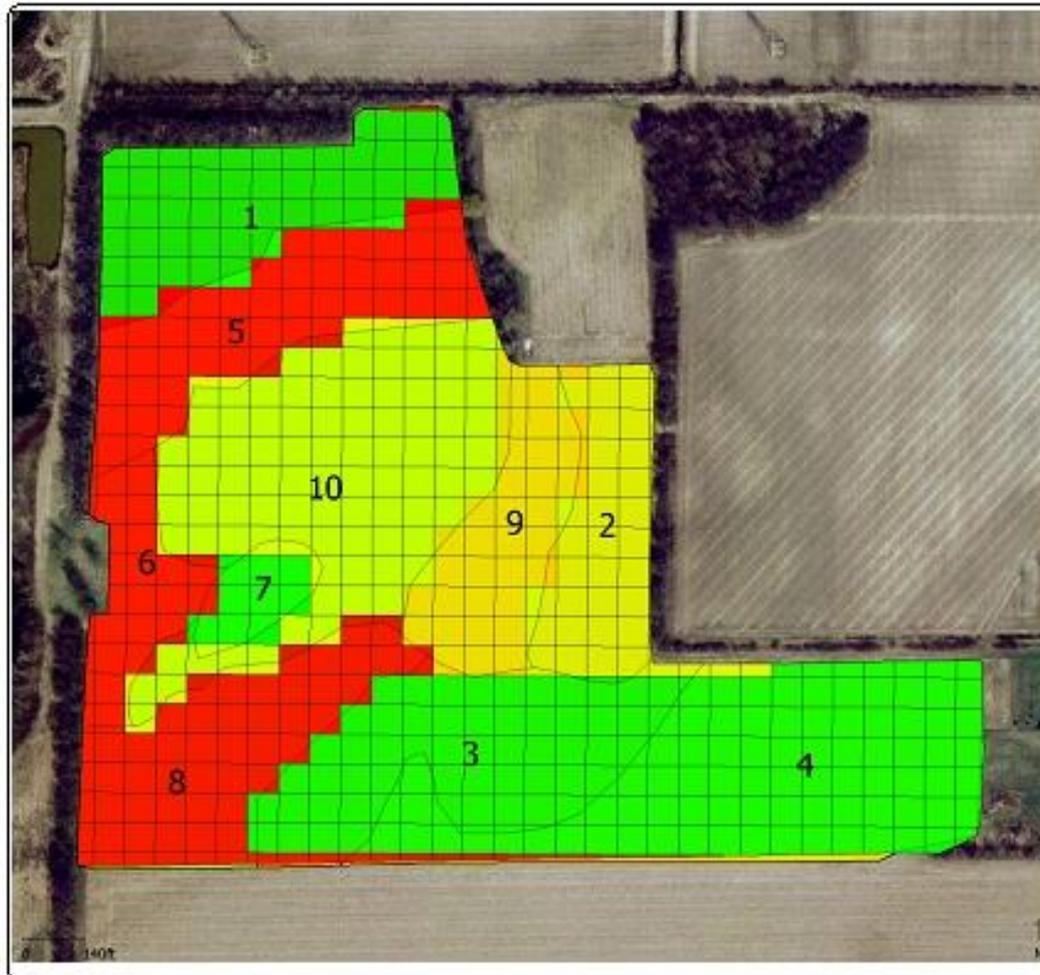
88.00	(7.41 ac)
77.00	(9.86 ac)
75.00	(7.20 ac)
46.00	(9.46 ac)
42.00	(21.92 ac)
30.00	(13.11 ac)
28.00	(6.09 ac)
26.00	(19.84 ac)
25.00	(5.23 ac)
14.00	(11.59 ac)
11.00	(11.04 ac)







Fertilizing Prescription (Dry) 2012 - GF#39(MAP)



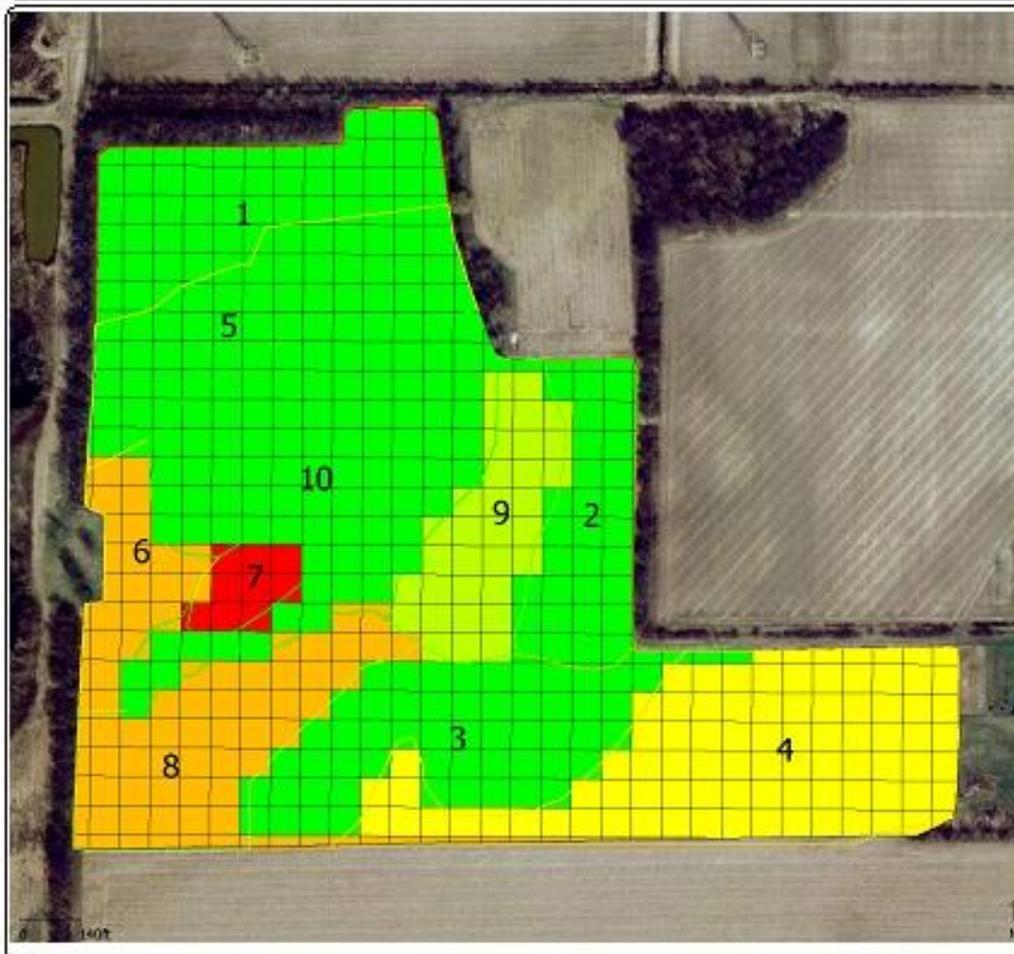
File: GF#39
 Year: 2012
 Operator: Fertilizing Prescription (Dry)
 Crop/Process: MAP
 Op. Instance: Instance - 1
 Area: 524.7 ac
 Total Amount: 5,111.7 lb
 Average Rate: 16.14 lb/ac
 Minimum Rate: 0.0 lb/ac
 Maximum Rate: 156.66 lb/ac

Target Rate (Mass) (lb/ac)

- 150.0 (21.54 ac)
- 125.0 (13.82 ac)
- 100.0 (3.89 ac)
- 0.0 (13.36 ac)



Fertilizing Prescription (Dry) 2012 - GF#39(Potash)



Field : GF#39
 Year : 2012
 Operator : Fertilizing Prescription (Dry)
 Crop / Product : Potash
 Op. Source : Insource - 1
 Area : 5207 ac
 Total Mass : 16754 lb
 Average Rate : 32.185 lb/ac
 Minimum Rate : 175.00 lb/ac
 Maximum Rate : 400.00 lb/ac

Target Rate (Mass) (lb/ac)

400.0	(30.678 ac)
375.0	(3.722 ac)
300.0	(9.234 ac)
225.0	(7.962 ac)
175.0	(1.015 ac)



Education

- Problem Recognition
- Existing Best Management Practices
- Research & Science Based BMP's -
- Retailer's influence on customers
- Certified Crop Advisor "CCA" conduit
- Agronomic and application decision making
- Applicator Training
- Research based nutrient recommendations
- Solution Implementation



Verification and Certification

- 4R Dealer Certification – voluntary program
- Pilot Project participants
 - Ohio based – Lake Erie Western Basin
 - Deshler Farmers Cooperative
 - Morral Companies
 - The Andersons, Inc.
- SCS Global Services
- Public Comment



Program Funding

- Initial Funding for audit development - \$30,000
 - Luckey Farmers
 - The Andersons, Inc.
 - Central Ohio Farmers' Cooperative
 - Morral Companies
 - Deshler Farmers Cooperative
 - The Nature Conservancy
 - Ohio Soybean Council
 - Farmers Cooperative
 - The Fertilizer Institute/Ohio Agribusiness Assn.
 - CHS
- Annual on-going program administration
 - \$150,000 estimate
 - Fulltime person
 - Office & travel expense
- Fee based dealer participation fee



Expected Result



- Clean Water
- Reduced phosphorus loads to Lake Erie
- Reduce or eliminate harmful algal blooms
- Agriculture's Participation – “doing our part”
- “Keep Phosphorus In Your Field”
- Improved soil health
- Environmental, Social and Economic solutions
- Commitment to all stakeholders

Thank You !



Right Source, Right Rate, Right Time & Right Place