

You have arrived at:

Living and Loving the Land: Nutrients, Stewardship in the 21st Century

Welcome!

We will get started
soon.



EPA MID-ATLANTIC REGION
2023 SUMMIT

Engaging and Investing for a
Healthy and Sustainable Future

Friendly Reminders Before We Get Started

Please [mute yourself](#) and [turn off your webcam](#) during presentations.

If you encounter technical difficulties during the meeting, you can:

- ✓ Send a chat message directly to Host or IT Support
- ✓ Email epamidatsummit@michaeldbaker.com with the subject line “Zoom Support”

This session is being recorded and will be made available after the summit.

*This presentation, and the accompanying slides, have not been subject to EPA management review, and thus do not necessarily represent the position of EPA or the United States on the matters discussed.

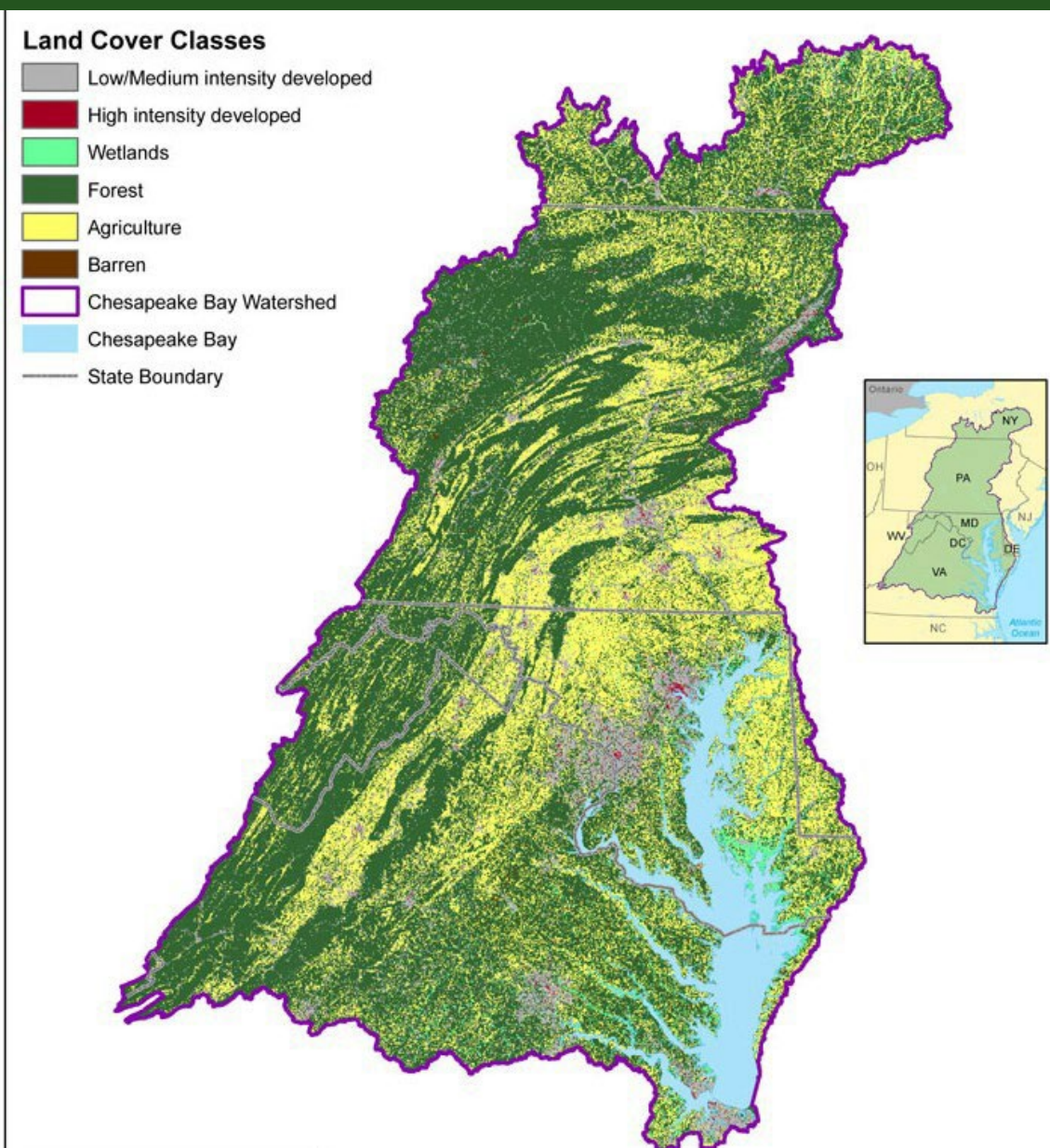


MidAtlantic 4R Nutrient Stewardship Association

Amy Jacobs, The Nature Conservancy
Lindsay Thompson, Delaware Maryland Agribusiness Association
Dean Collamer, Growmark FS

EPA MidAtlantic Summit
May 17, 2023

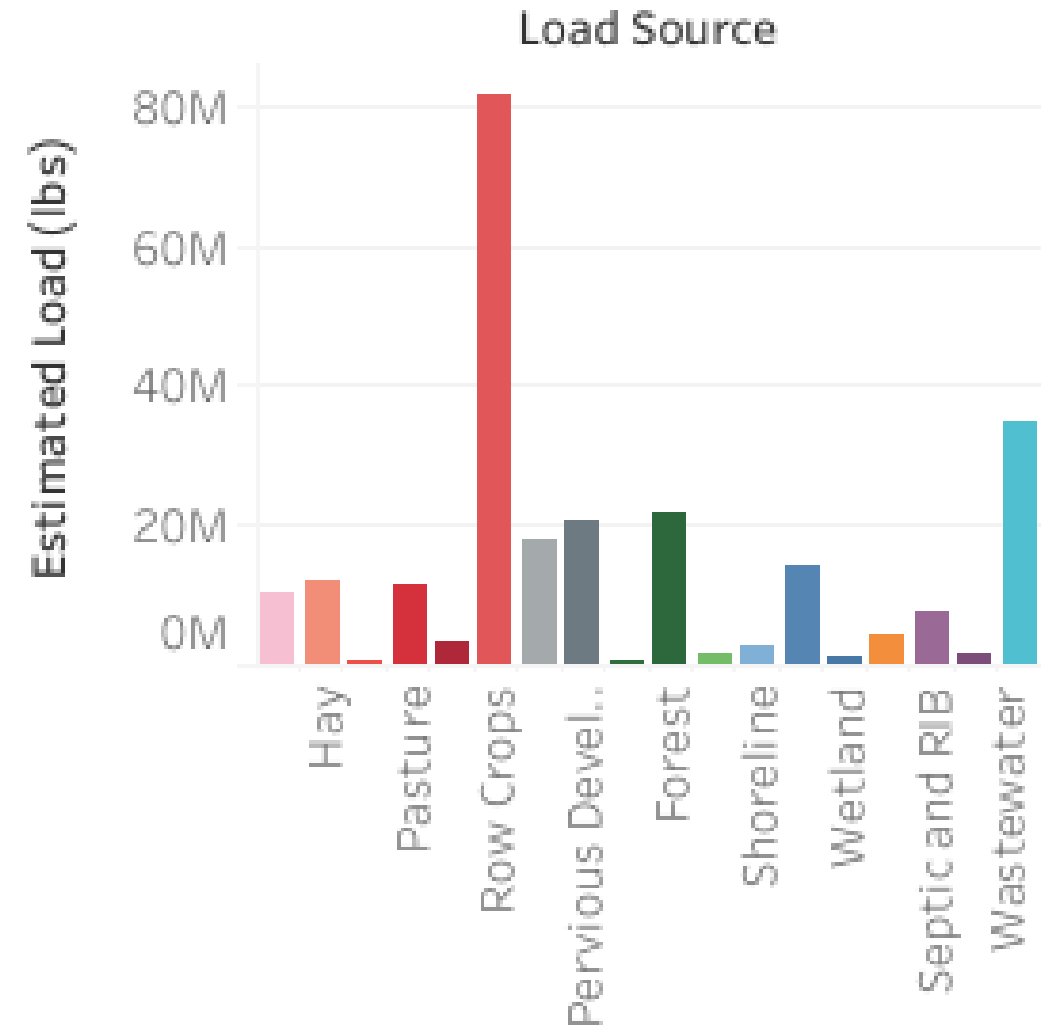
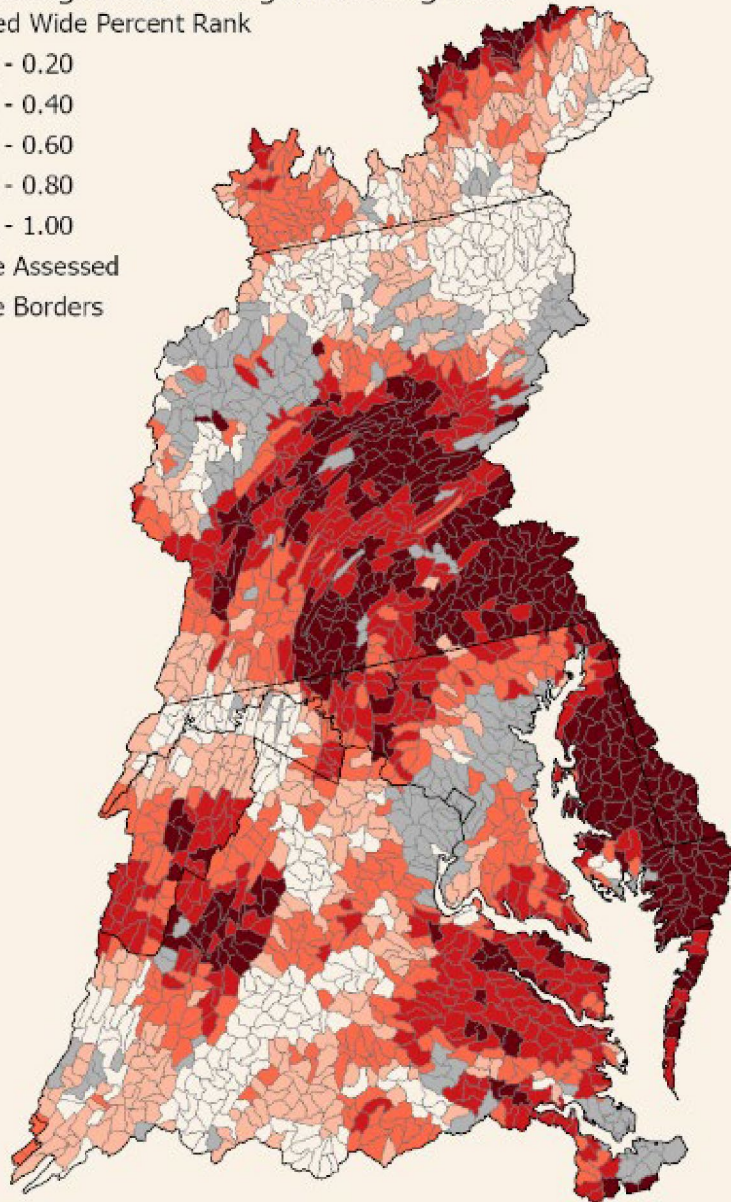
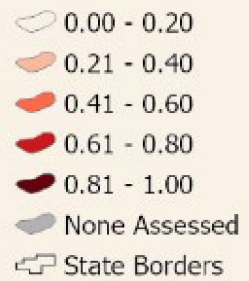
Agricultural Lands in the Chesapeake Bay



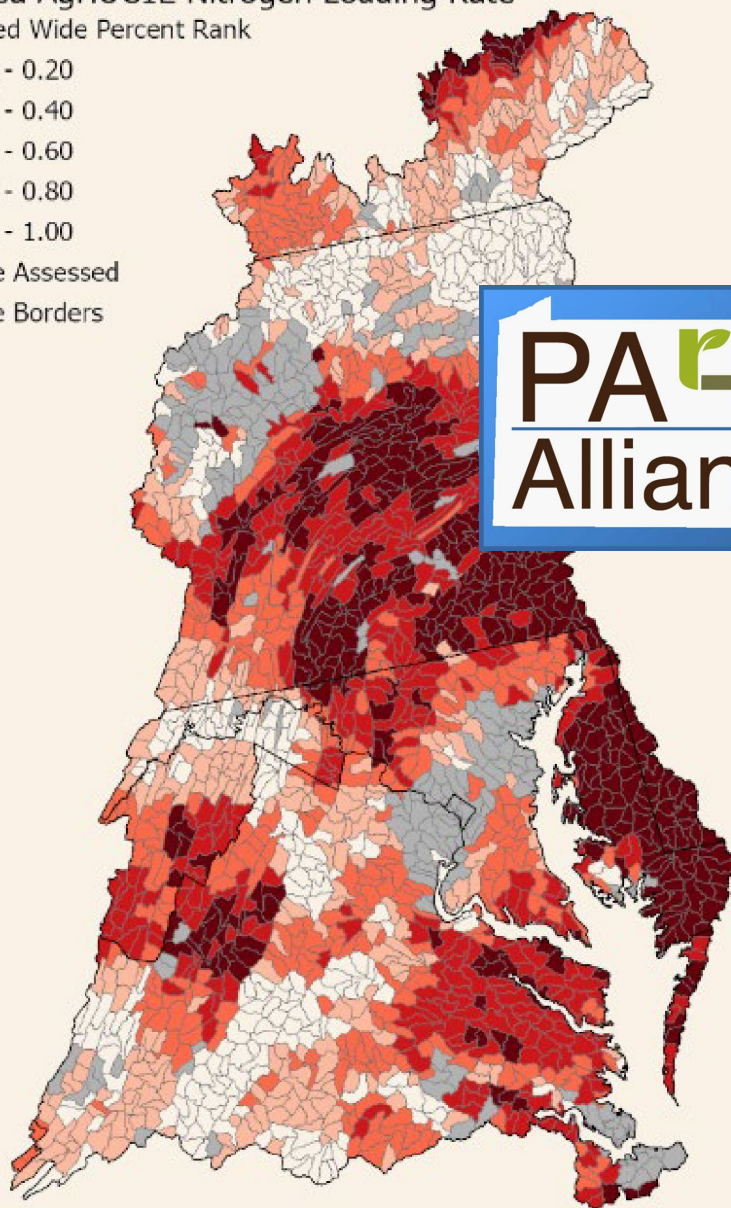
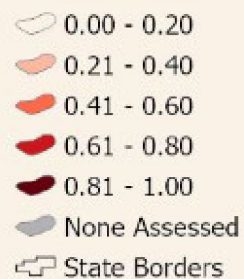
Chesapeake Bay
83,000 Farms
4 Million Acres Cropland

Chesapeake Bay Nitrogen Sources

Delivered AgHUC12 Nitrogen Loading Rate
Watershed Wide Percent Rank



Delivered AgHUC12 Nitrogen Loading Rate
Watershed Wide Percent Rank



PA 4R
Alliance



MidAtlantic 4R
Nutrient
Stewardship
Association



4R Partners



Barriers to 4R Implementation



Access to
Equipment
&
Technology

Local
information
from a
trusted
source

Economics
/Cost

Weather
& Timing

Accelerating Adoption



Education and Outreach

Testing New Incentives

Evaluating Economic, Agronomic,
Environmental Outcomes

133,000

Acres
4R Practices
Implemented

>56,000

Farmers and
Advisors Reached
through Education
and Outreach

Who is GROWMARK FS?

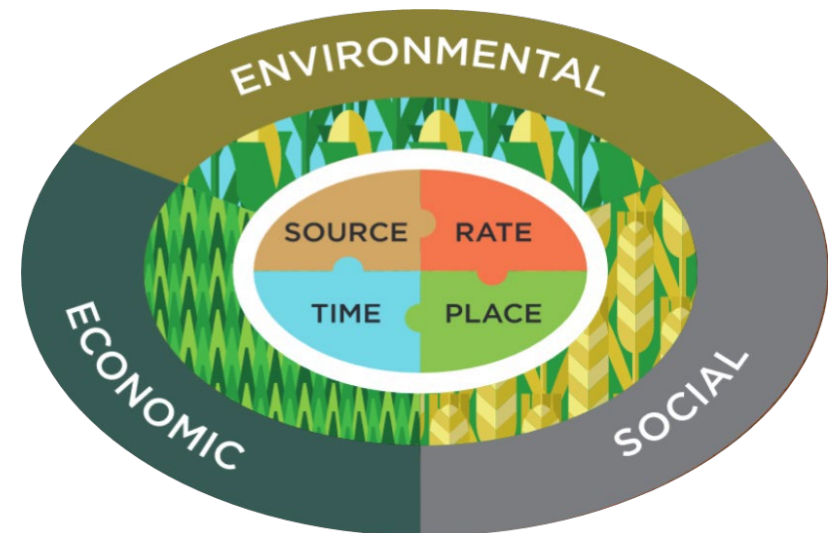


- Operates 46 full service ag retail locations in 6 states
- Wholly owned subsidiary of GROWMARK, Inc. (Midwest coop)
- Support to a wide variety of crops including seed, plant nutrients, lime, crop protection products, custom application, precision ag and propane
- John Richman, General Mgr.
- ± 500 Employees
- > 22,000 Active Customers



Commitment to 4R Nutrient Stewardship

- GROWMARK FS is committed to delivering to farm customers – a Nutrient Management System.
 - Focused on 4Rs Nutrient Stewardship principles & implementation.
 - 4Rs provides a framework to achieve cropping system goals – increased production, increased farmer profitability, enhanced environmental protection, and improved sustainability.



Nutrient Management System Goals

- Maximize utilization of available organic nutrient sources
- Balance nutrient applications with realistic crop yield goals
- Optimize nutrient use efficiency through crop system decisions
- Conserve soil nutrients for plant production and soil health
- Mitigate loss of nutrients to air, surface waters, and ground water
- Evaluate decisions for continual system adaptation



GROWMARK FS partners with Farm Customers to:

- Review/Improve their Crop Management System
- Develop a Nutrient Budget
- Maintain Recordkeeping Where Feasible
- Evaluate and Adapt Crop Decisions

GROWMARK FS, LLC
Satisfying Customers. Profitably

**Field Specific Fertility**

Premium Fertility Management Platform – 3 year plan

1. GIS Field Platform

- Field Maps
- Field Identification System
- Fields and Crops Manager



GIS mapping with labels, roads, buildings, and acres. A consistent field ID system. These features will organize your entire farm.



This software will allow you to: organize all crop records in one place and make them easily accessible. Organized records for compliance reporting. Field and Crop identification and histories. Improved crop and rotation planning. Fertility recommendations, updated electronically. Sub-field management information and more.

2. EC Mapping and creation of Management Zones on one third of farm.



3. Soil Sampling of management zones on one third of farm



4. Intensive Fertility Plan for one third of farm

5. Customized Fertility Plan for fields not EC Mapped.

6. Yield Analysis at Agrinetix's Yield Lab



Qualified/Certified/Experienced Crop Specialists

- Periodic GFS agronomy tech training
 - 4R nutrient stewardship
 - Classroom, in-field, virtual
- Product training - ongoing updates by vendors for seed, nutrients, crop protection products, biologicals, precision ag
- Certified Crop Advisers (CCA) qualification ~ 40%
- Typical Field Experience: 15+ yrs.



Natural Uncontrollables/Unknowns



Adaptive In-Season Tools for 4R Implementation

Source, Rate, Time and Place

- Chlorophyll Meter
- PSNT
- Aerial Imagery
- N Modeling
- Tissue Testing
- Variable Rate Application
- N Stabilizers – Limit Losses to Environment



Typical Bottom Line: Reallocate N with Same Field Total Yield; Decrease N Losses in Less Productive Zones

Reporting and Verification Challenge

- Self Reporting Opportunity for Nutrient Mgt. BMPs but....
Interpretation of exact terminology is a problem, e.g. split N timing
- 100% Verification Requirement is a Huge Manpower Demand and Expense (for grower + trusted advisor)
- 4R BMP field record-keeping is near impossible task on a broad scale
 - Especially Challenging for Manure
 - Manageable for Some Farm Operations



High NUE

Lower Risk of
Nutrient Loss

Optimized per bu.
Fertilizer Budget

Higher
Profitability

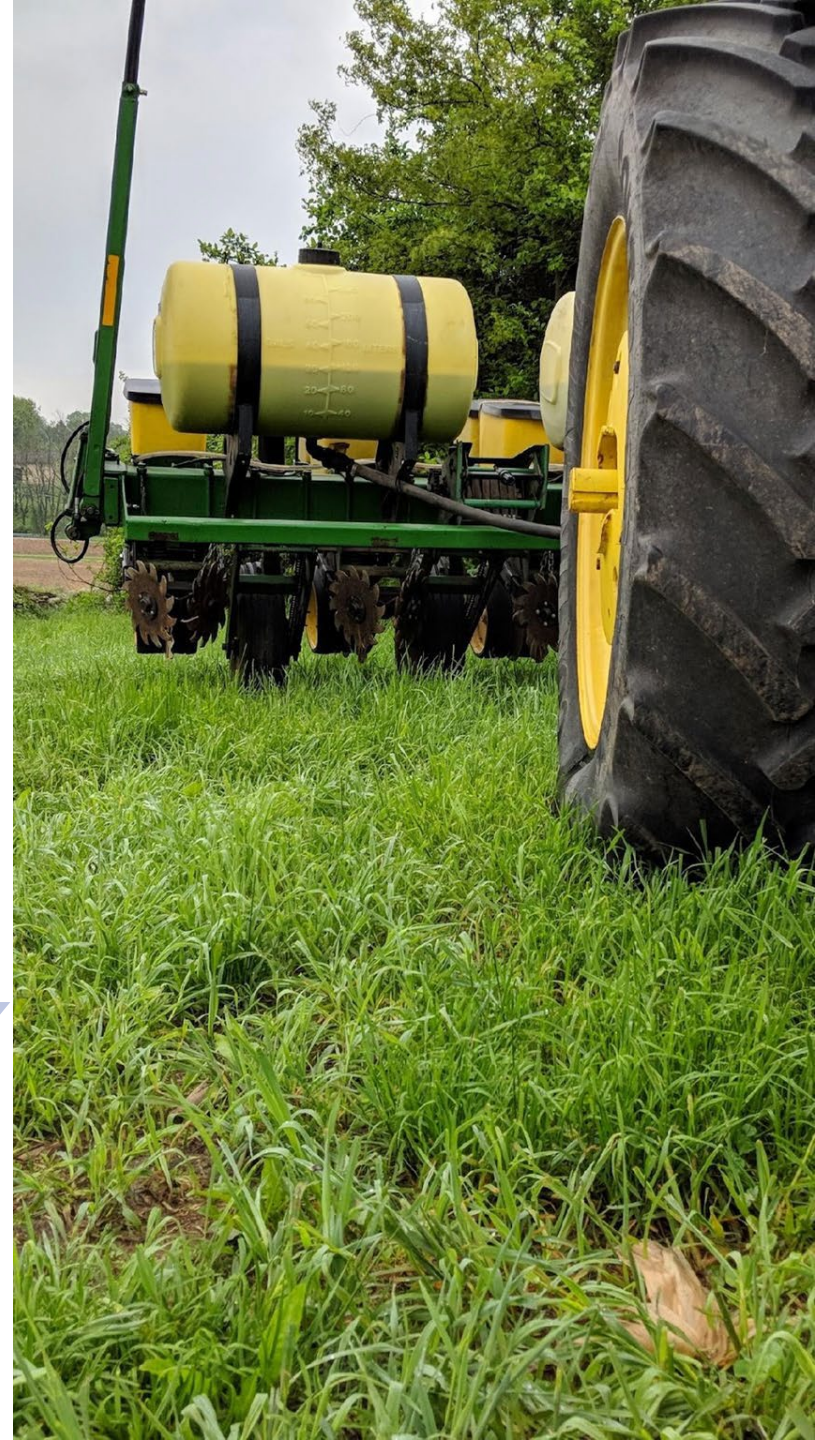
Increased Risk of
Nutrient Loss

Wasted Fertilizer
Dollars

Lower
Profitability

Low NUE

Remember – Higher NUE's have
lower numbers! 0.75 is better
than 0.95



Increasing NUE is *not* Accidental

Every field has the potential for increased NUE!

4R NUTRIENT STEWARDSHIP



RIGHT SOURCE



RIGHT TIME



RIGHT RATE

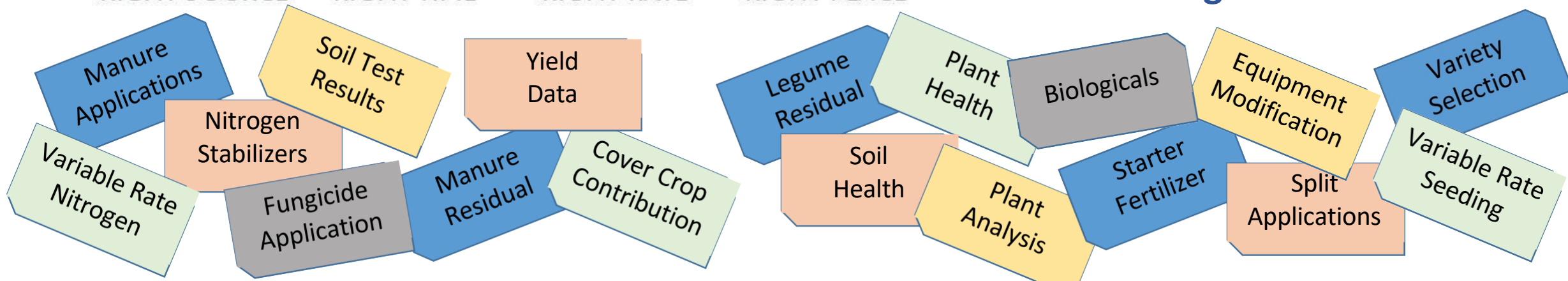


RIGHT PLACE

Assess soil characteristics &
active site specific N loss
pathways

Assess farm capabilities

*Implement a Nutrient
Management Plan*



SPLIT NITROGEN PROJECT

Made Possible with Funding from:



2021 Results

1 FARMS | 2,436 ACRES

Co-operators reimbursed \$15/ A
for implementing additional split N application

Participant Criteria:

- **Corn Acres**
 - Minimum Enrollment – 40 Acres
 - Maximum Enrollment – 400 Acres
- **Willingness to:**
 - Optimize Split Applications of Nitrogen based on site-specific conditions and yield goals
 - Split apply nitrogen on enrolled corn acres to meet supplemental nutrient management criteria for nitrogen
 - Provide a comparison check strip where all N is applied up front
 - Share production information & yield data
- **Current regulatory compliance** on enrolled acres

ADAMS COUNTY SPLIT N 2021 PILOT PROJECT

Made Possible with Funding from:



Chesapeake Bay Stewardship Fund



Science. Restoration. Partnership.

N APPLICATIONS

	Control	+ Split
pop-up fertilizer	3	3
2x2 starter	0	0
legume history	0	0
manure history	20	20
planned manure	35	35
pre-emerge	120	60
sidedress	0	65
Total	178	183
Yield	157	188
Nitrogen Use Efficiency (NUE)	1.13	0.97
Increase in NUE		13%



ADAMS COUNTY SPLIT N 2021 PILOT PROJECT

ECONOMICS

	Control	+ Split
Total Revenue	\$954.56	\$1088.32
Nitrogen Fertilizer Cost / A	\$74.00	\$86.02
Nitrogen Fertilizer Cost / bu	\$0.47	\$0.44
Increase in Revenue		12%
Decrease / bu in Fertilizer Costs		3%

Economic Assumptions:

- \$370 – UAN Pricing June 2021
- \$6.08 – Corn Price November 1, 2021



\$600 – UAN Pricing January 2022

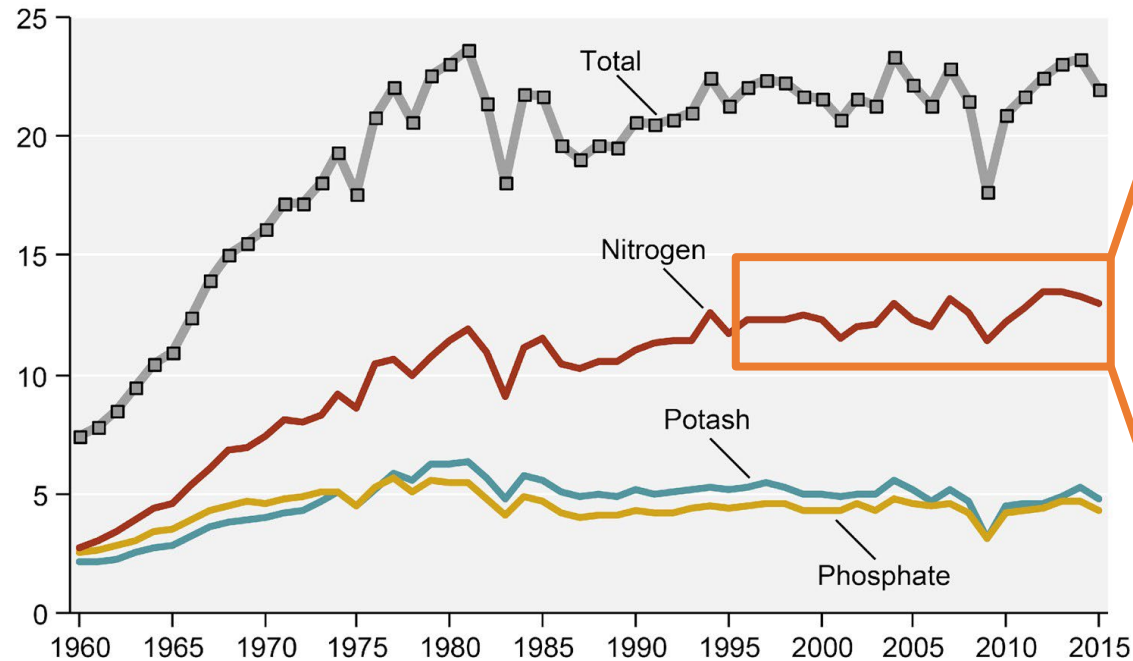
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U.S. Fertilizer Use and Corn Yield Over Time

Commercial fertilizer use in U.S. agriculture, by primary nutrient, 1960-2015

Short tons (million)



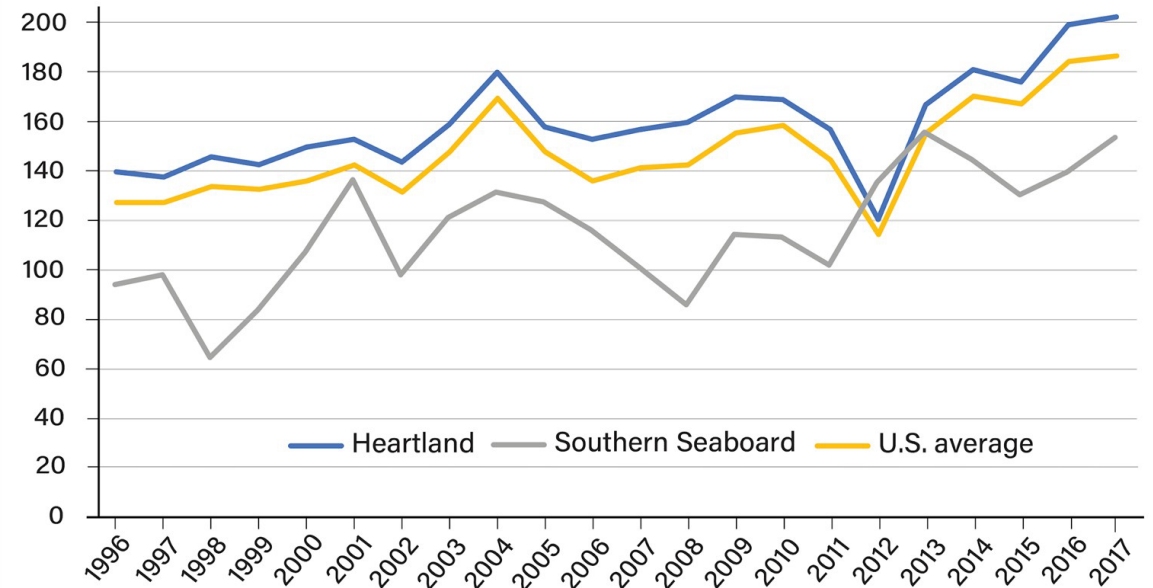
Note: 1 short ton equals 2,000 pounds.

Source: USDA, Economic Research Service, using data from Tennessee Valley Authority, Association of American Plant Food Control Officials, and The Fertilizer Institute.

U.S. corn yields by select region, 1996-2017

USDA Economic Research Service
U.S. DEPARTMENT OF AGRICULTURE

Bushels per acre



Notes: **Heartland** includes parts of Illinois, Iowa, Kentucky, Minnesota, Missouri, Nebraska, Ohio, and South Dakota. **Southern Seaboard** includes parts of Alabama, Arkansas, Delaware, Georgia, Louisiana, Maryland, Mississippi, North Carolina, South Carolina, Texas, and Virginia.

Sources: USDA, Economic Research Service, Costs and Returns.

Summarizing Key Points

- The 4R Alliances are working as change agents to promote the science and adoption of 4R nutrient stewardship in the Bay watershed.
- Farmer decision making related to crop and fertilizer plans are complex and change in response to in-season factors.
- Good nutrient management practices are economically and environmentally sustainable, especially when fertilizer prices are high.
- More advanced 4R practices (e.g., variable rate application, split N) are being applied than are being reported, verified, and credited because reporting is difficult and expensive.
- It is important to find a better, more cost-effective, credible, and defensible way to measure what farmers are doing; especially related to fertilizer input data.



We are on a brief break.

The next session will
start at 2:45 P.M.

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