

Manure management in the Chesapeake Bay watershed: strengths, challenges & opportunities



About me....



Goal and Session Overview

Overview:

- What is working well
- Why are we off track?
- Future opportunities

Background photo credit: Applying raw broiler litter on a no-till field just before planting. Photo credit: H. Tewolde

Sustainable Chesapeake: What We Do

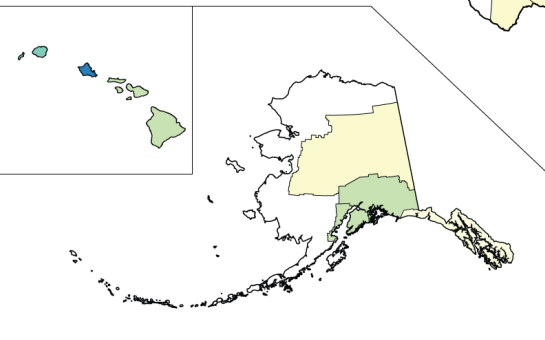
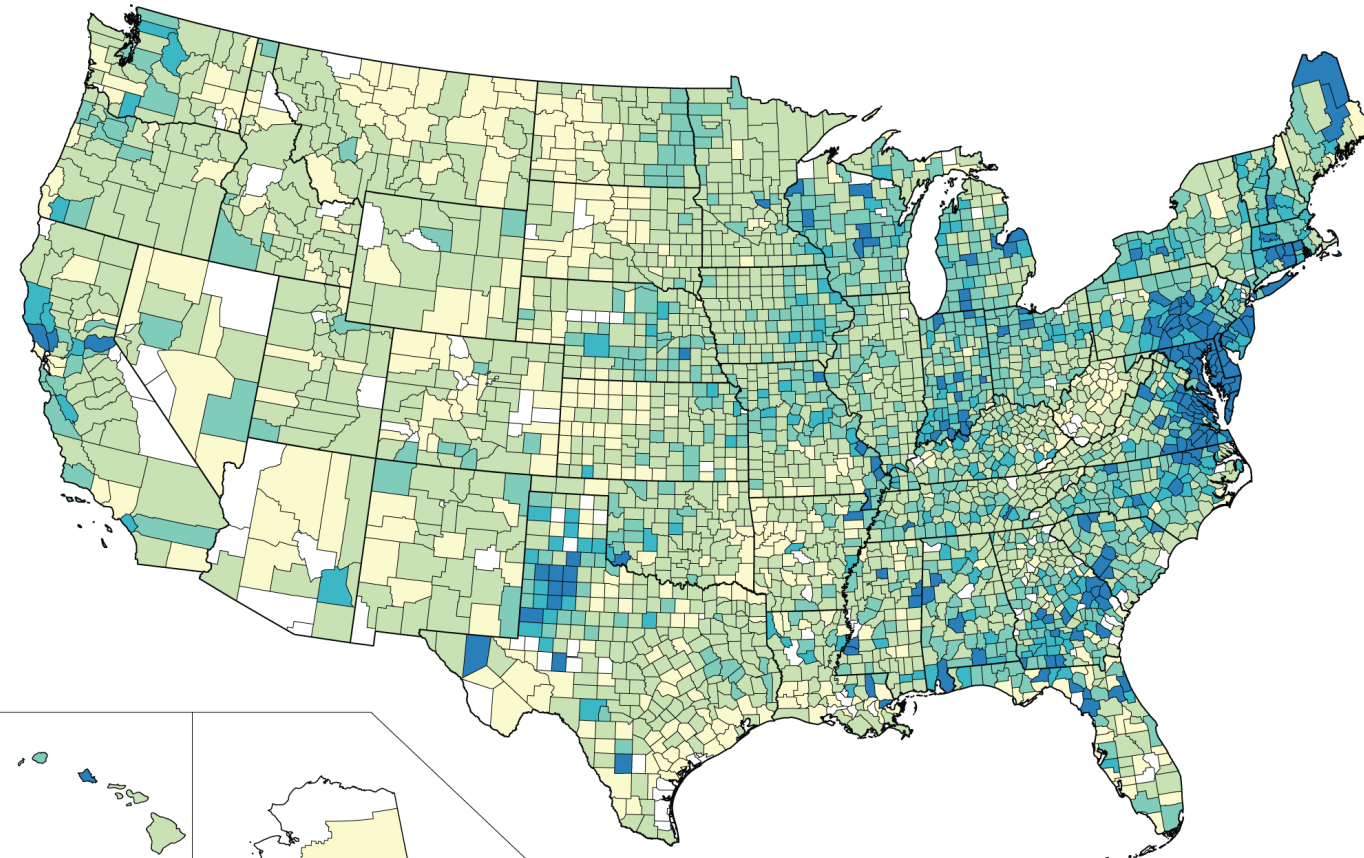
Our Mission: We advance innovative solutions that benefit farms, communities and the Chesapeake Bay

- **Partnerships and collaboration**
- **Innovative technologies and incentives**
- **Connecting partners with TA & FA resources**

What is working well

- **Conservation and ag partners working collaboratively**
 - **Agribusiness and farmer leadership is growing**
 - **Record funding for manure management practices**
 - **Nutrient management planning is helping**
 - **Poultry litter transport**
 - **Cover crop adoption is high**
- 
- A red tractor is shown from a rear-quarter perspective, moving across a field. It is pulling a large, complex implement, possibly a cover crop planter or a similar conservation tillage machine. The field appears to be a mix of green grass and brown, tilled soil. The tractor has large, treaded tires and a yellow implement with multiple rows of wheels and blades. The overall scene is a typical agricultural setting.

Cover crop use as a percent of total cropland, by county, 2022



Cover crop use (percent)

- 0-1
- 1-5
- 5-10
- 10-15
- 15 or more

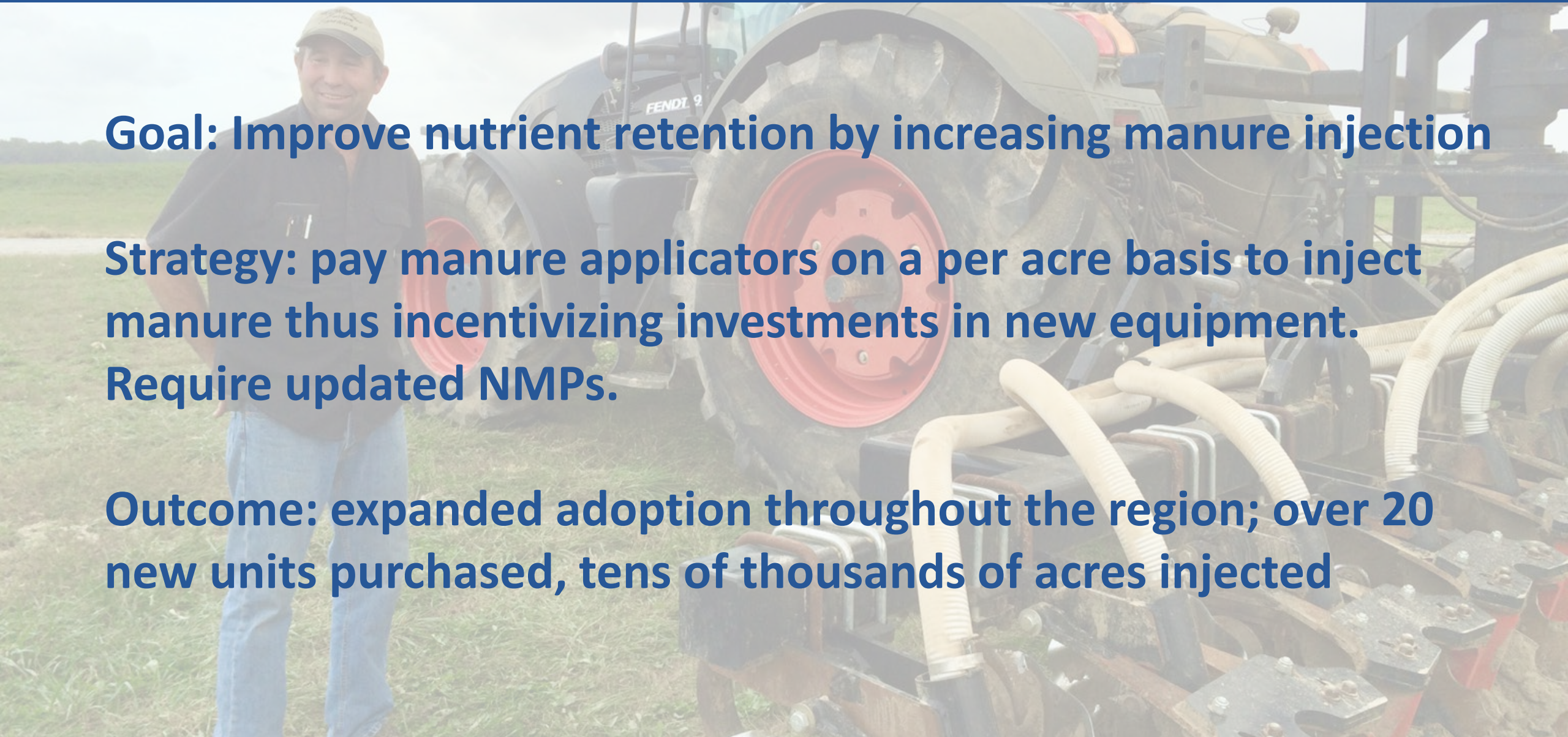
Incentivizing Private Investments in Equipment

Goal: Improve nutrient retention by increasing manure injection

Strategy: pay manure applicators on a per acre basis to inject manure thus incentivizing investments in new equipment.

Require updated NMPs.

Outcome: expanded adoption throughout the region; over 20 new units purchased, tens of thousands of acres injected



Manure/Litter Matching Services

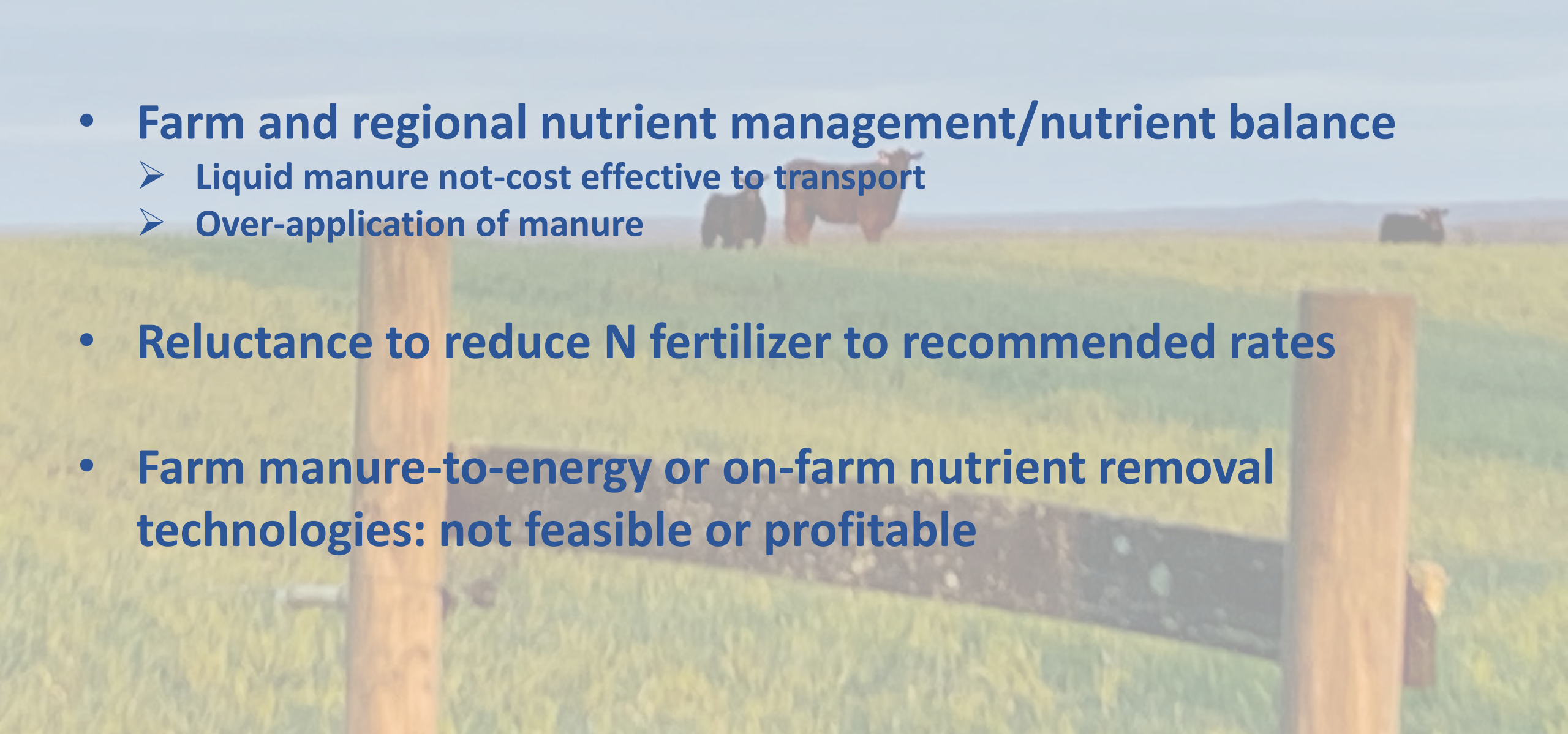
An aerial photograph of a large farm complex. Several long, red barns with grey roofs are arranged in a row. There are several large silver silos scattered throughout the farm. A pond is visible on the right side of the image. The surrounding area is green with trees and grass.

Littr.

Connect your poultry litter and agricultural services to those that need it most

[Browse Listings](#)

Why are we off track?

- **Farm and regional nutrient management/nutrient balance**
 - **Liquid manure not-cost effective to transport**
 - **Over-application of manure**
 - **Reluctance to reduce N fertilizer to recommended rates**
 - **Farm manure-to-energy or on-farm nutrient removal technologies: not feasible or profitable**
- 

Farm Infrastructure / Management Challenges

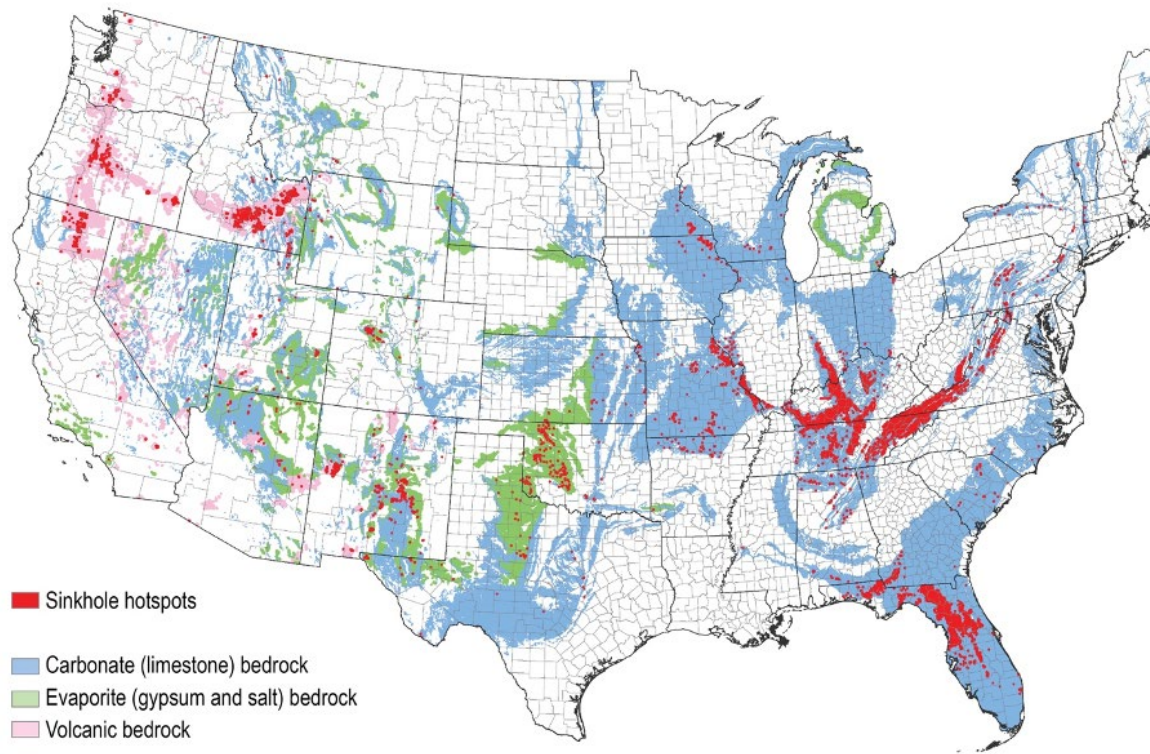


Geography & Unintended Consequences

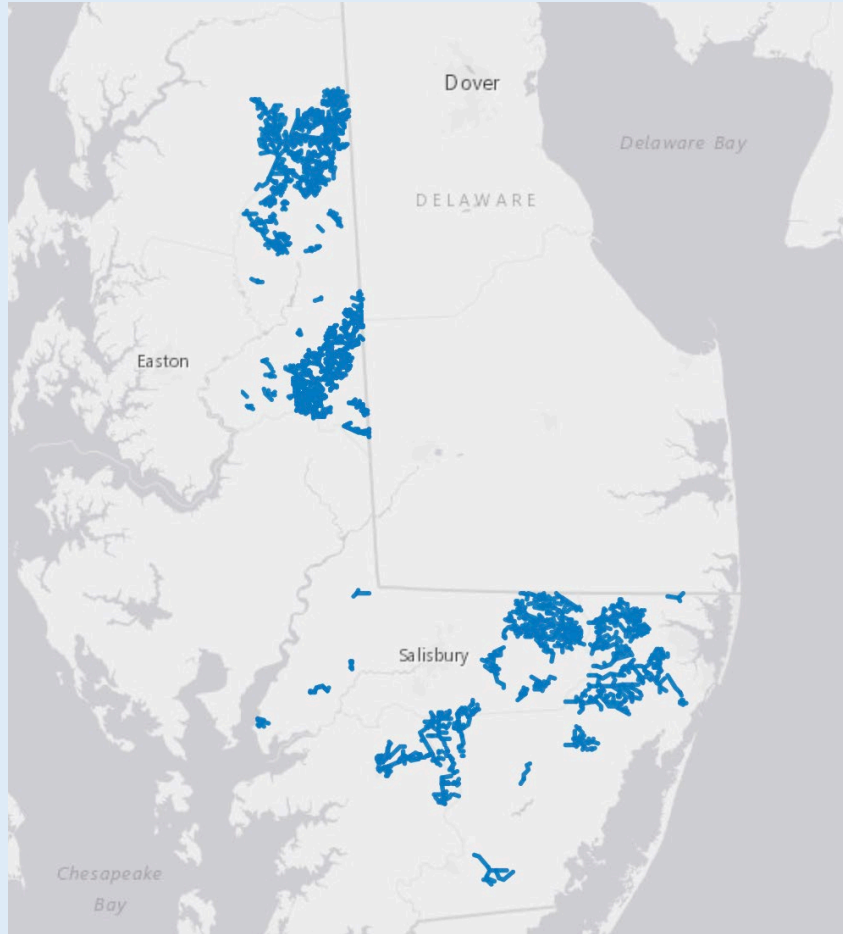
- **No free lunch with no-till**
- **Karst topography in the west; drainage networks in the east**



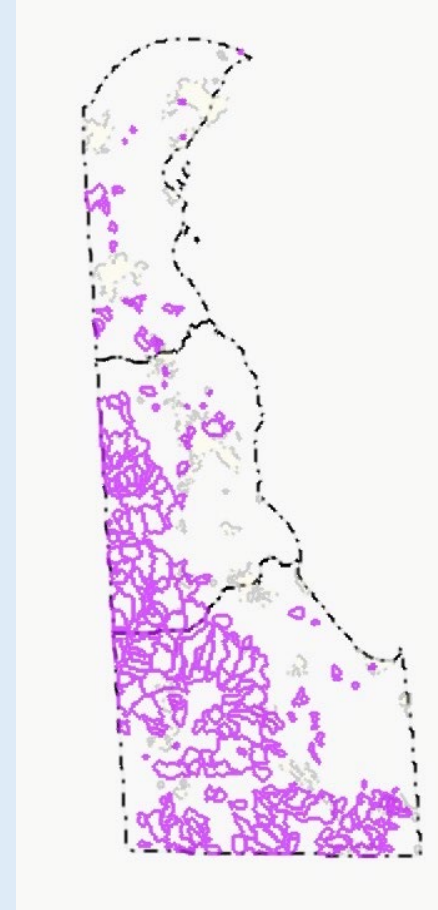
Increased nutrient transport risk: karst topography in high-density animal production areas



Network of tax ditches on the MD Eastern Shore & DE



Tax ditches and public drainage associations in selected areas on the Lower Maryland Eastern Shore: Eastern Shore Regional GIS Cooperative

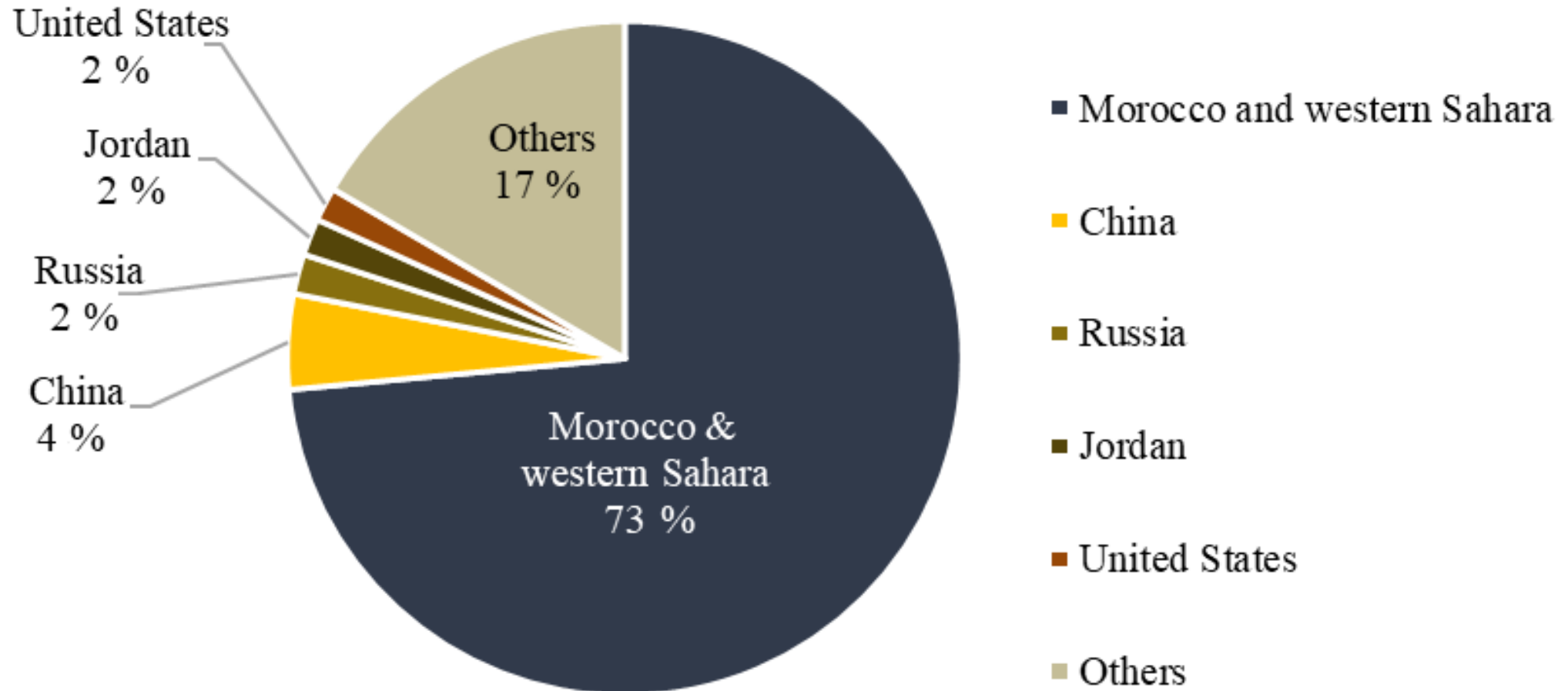


Tax Ditch layers for the State of Delaware: DNREC, Division of Watershed Stewardship, Drainage Program

Agribusiness Leadership: Maola Milk & Alliance for the Chesapeake Bay



Future Opportunities: Cost of P likely to increase



Estimated global phosphorus reserve distribution. The vast majority (73 %) of estimated natural reserves lie in Moroccan and west Saharan territories (USGS, 2017).

**Once & Future
Opportunity:
Public/Private
Investments in Litter
Processing?**



Future
Opportunities:
Improved
Nutrient
Management;
Reduced need
for N fertilizer

Graphical Interface to Determine Cover Crop and Soil Organic Matter N Credits

Online Calculator for Corn Nitrogen Fertilizer Recommendations that Credit Cover Crops and Soil Organic Matter

Enter the inputs below to calculate a nitrogen fertilizer recommendation for corn based on site-specific cover crop and soil organic matter measurements. The equations in this tool have been calibrated based on field trials conducted across Pennsylvania over multiple years and are sensitive to regional climatic conditions. Because of the regionally-specific calibration, the tool should not be used to develop N fertilizer recommendations outside of Pennsylvania.

Revised with new calibration in February 2023.

Inputs

Average Corn Yield Goal (bu/ac) ⓘ

200

Clay Content (%) ⓘ

25

Sand Content (%) ⓘ

25

Soil Carbon (%) ⓘ

2

Soil C:N Ratio ⓘ

10

Winterkilled Cover Crop Biomass N (lbs/ac) ⓘ

0

Spring Cover Crop Biomass N (lbs/ac) ⓘ

80

Spring Cover Crop C:N Ratio ⓘ

24

Diagnostics and Results

Critical Spring Cover Crop C:N

Ratio for N Immobilization ⓘ

24:1

Cover Crop Yield

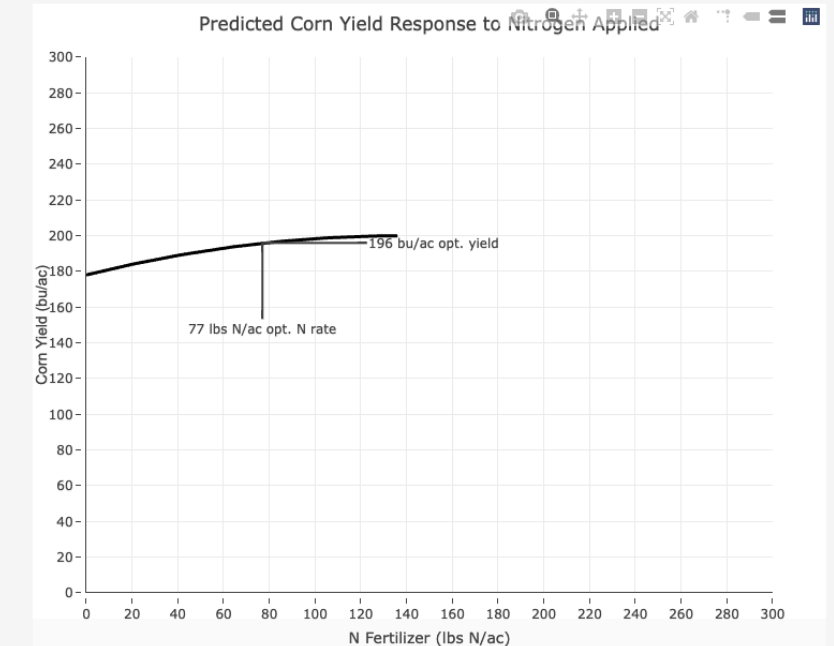
Credit ⓘ

-3 bu/ac

Additional Recommended

Nitrogen ⓘ

77 lbs N/ac



Other Ideas? Questions? Let's talk!

Kristen Hughes Evans
Executive Director
Kristen@susches.org

