



The Delmarva Farmer



New N management tools may impact your plans (Choice Voice)

by Chris Brosch, Jen Nelson | May 10, 2019

(Editor's note: Jen Nelson is a Delaware-Maryland 4R Alliance Communications coordinator, and Chris Brosch is the Delaware Department of Agriculture's state nutrient management program administrator.)

Nitrogen earns its reputation as a tricky nutrient to manage for corn production because it is mobile and prone to loss.

In a heavy rain, it can be carried in runoff, leach, or in prolonged wetness, bubble into the air.

If applied to the soil surface in warm windy conditions, manure nitrogen can

also volatilize.

For these reasons, weather has a profound effect on the amount of nitrogen available to your crops.

Up to two-thirds of nitrogen applied to corn fields may not be available in the soil for the plant to utilize.

It makes sense that N recommendations that can change in-season due to irregular conditions — increasing side-dress rates when yield potential is above average and reducing rates when potential is already limited — should result in nitrogen applications that improve profitability.

That's the aim of in-season nitrogen modeling.

Model brands like Adapt-N, Eco Nutrition, Encirca and Climate FieldView, offer an adaptive tool that can help to predict in-season nitrogen needs for corn.

While each company uses its own proprietary software, all the models generally work by integrating information about the corn field's conditions (variety, weather, applied nitrogen rate, source, timing, etc.).

The technology allows you to track the nitrogen "status" of the crop throughout the growing season.

Jason Scott is a Maryland farmer using Encirca as a guide for applying his sidedress N.

"I am still following my nutrient management plan, but am using Encirca to make sure that I put extra N where needed and also don't overapply to areas that may already have plenty," he says. "I wouldn't say that it's an essential tool, but I think that it is a helpful tool in the toolbox of nitrogen management.

The biggest advantage that I can see is that it is more of a real time estimate of your N in the soil than a nutrient management plan that is written in January and doesn't take into account weather or the growing season."

Harold Van Es from Cornell University who worked on developing the Adapt-N model offers three ways that nitrogen models support a successful nutrient

management strategy.

First, they have the ability to adapt the recommendation to the specifics of the field (soil type, organic matter, tillage, yield potential, rotation effects, cover crop effects, manure nitrogen credits, etc.).

Secondly, nitrogen models can continuously monitor the impacts of seasonal weather effects and respond by adapting nitrogen rates and considering mid-season rescue applications.

Finally, models integrate with new technologies (N stabilizers, controlled release N, site-specific and high-clearance applicators, GIS, soil organic matter maps, cover crops, etc.).

Cornell strip trials, using Adapt-N, in the Northeast and Midwest have demonstrated increased profit and lower nitrogen losses, but not all research had been positive.

“At this point in time, we do not have sufficient scientific data to suggest if the current modeling tools provide any benefit,” stresses Dr. Gurpal Toor, University of Maryland Nutrient Management Extension Specialist. “This is partly because the owners of these modeling tools have not yet provided software access to researchers; hence, we cannot scientifically scrutinize validity of their claims.

More information is needed about how the models perform in our area and whether or not the practice shows a real benefit to farmers and the environment.”

Basic per-acre rates for nutrient application based on yield performance averages are in-fact a simple nitrogen model and have long proven to be economically viable.

The averages (three out of five years in Maryland and four out of seven years in Delaware) will self-adjust more slowly than seasonal calculation in an integrated model, like those recently entering the marketplace.

Toor encourages farmers to follow Land Grant University recommendations, applying nitrogen in split applications and to use PSNTs while new models

continue to be evaluated.

If local research and farmer experience demonstrate that nitrogen models are a good fit in our area, they should be used to complement established good practices.

For example, split nitrogen applications are important for nitrogen-use efficiency with or without the use of a model.

Nitrogen applied early in the season is vulnerable to loss during heavy rains like the ones we saw in 2018.

In a recent weekly crop update, University of Delaware Extension Specialists Dr. Amy Shober and Dr. Jarrod Miller have been recommending that farmers should apply 15 to 25 percent nitrogen as starter fertilizer, and the remainder when corn plants are 12 to 15 inches tall (V5 to V6).

From a modeling standpoint, too much nitrogen applied at or before planting also limits the flexibility to modify nitrogen application rates later in the season in response to growing conditions.

Dwight Dotterer, Maryland Department of Agriculture's Nutrient Management Program Administrator, says that the department is looking into the practice.

He urges farmers in Maryland to fill out a Research Exemption Form, particularly if they use the model's recommendation to justify applications that exceed LGU recommendations.

"The form outlines the correct process for research trials and we ask them to cooperate with the University of Maryland or a private consultant, who can verify the research was conducted correctly," says Dotterer.

Delaware Department of Agriculture's Nutrient Management Program

Administrator Chris Brosch is also looking at the potential for these new tools.

"We hope as these technologies are adopted, that producers are willing to document and report their use in order to get water quality bonus credits," Brosch said. "Delaware would like to explore some data sharing projects to take full advantage of cutting-edge tools as it saves fertilizer and protects our

water quality.”

Nitrogen models may offer potential for farmers in our area to improve their nitrogen use efficiency in combination with other established best management practices.

Agribusinesses, researchers, farmers and nutrient management programs all have a role in testing the tools and assessing their benefits.

Farmers should work with their Nutrient Consultants to learn about this adaptive management approach so that they remain within compliance of their local Nutrient Management regulations.

(Writers' note: The DM4RA-Maryland 4R Alliance is a collaboration between agribusinesses, farmers, government agencies, conservation groups and scientists. We're working to ensure that every nutrient application on Delaware and Maryland farms is consistent with the 4Rs- the right nutrient source, applied at the right rate, at the right time, in the right place. We are focused on increasing implementation of 4R practices to benefit the economic, environmental and social well-being of our region and our farmers. Learn more at 4RMidAtlantic.com.)

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