



## Northern New York Agricultural Development Program News

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### **NNYADP Research Enhancing On-Farm Precision Nitrogen Management**

The Northern New York Agricultural Development Program (NNYADP) and Cornell University Crop and Soil Sciences and Earth and Atmospheric Sciences departments have released the results of their latest efforts to enhance real-time weather-based precision nitrogen (N) management in New York state's northernmost counties. The most recent NNYADP Adapt-N project report summarizing 2011-2013 field trial data is posted at [www.nnyagdev.org](http://www.nnyagdev.org).

Based in part on 18 years of field studies in Northern New York, the van Es Lab at Cornell University developed the Adapt-N data-driven simulation software to help reduce uncertainty about optimum nitrogen application rates, particularly driven by early-season variable weather conditions.

'Nitrogen management on corn silage and grain acres can be costly when the nutrient is overapplied without any gain in crop yield. The dynamic recommendations of Adapt-N can reduce overall inputs, cost, and environmental losses,' says Cornell Crop and Soil Sciences Professor Dr. Harold van Es.

The farmer-led NNYADP has funded Cornell to refine the software that functions in real-time, daily adapting recommendations to current weather conditions. Farmers and crop consultants can receive weather-adjusted updates daily via email or text alert.

Growers and service providers can also receive instantaneous recommendations by inputting field-specific data, including soil type, organic nitrogen sources, soil and crop management practices, crop growth, and weather impact, using any device with internet access. Field managers can monitor nitrogen availability to crops throughout the growing season.

The Cornell University Department of Earth and Atmospheric Sciences developed a process for incorporating 3x3-mile grids of daily high-resolution rainfall and temperature data that Adapt-N uses to calculate how much nitrogen is needed.

The NNYADP project included training for farmers and crop consultants on the proper use of the tool to gain the benefits to crop production, economic efficiency on the farm, and environmental stewardship.

More than 20 farmers and crop consultants in northern NY tested the Adapt-N cloud-based software, running simulations for nitrogen application recommendations at more than 350 sites in 2013.

Nine of 12 on-farm Adapt-N trials completed on Northern New York farms in 2013 met criteria for evaluating grower benefits. In eight instances nitrogen use was decreased, by an average of 37 lbs/acre. Seventy-eight percent (7 trial sites) reported increased profit with an average of \$23/acre.

Noting that each subsequent year of field research enhances the precision of the tool, Cornell Crop and Soil Sciences extension associate Dr. Bianca Moebius-Clune estimates that currently Adapt-N could improve Northern New York grower profits in 70 percent to 80 percent of locations, on average by \$20-\$30/acre, and more in wet years when profit comes from maintained yields.

Consultant Eric Bever, of Champlain Valley Agronomics, who has tested Adapt-N for two years with growers in eastern NNY, says, 'We have received good reception from the farmers and have seen upwards of \$30/acre savings with Adapt-N as a predicting model. Without knowing how much nitrogen is actually in the field, the tendency is to apply on the high side and that volume of 'insurance' N may not be needed. Increasing nitrogen application efficiency puts money in farmers' pockets, saves field time and labor, and reduces trips across the field and soil compaction.'

To learn more about Adapt-N, visit the Northern New York Agricultural Development Program at [www.nnyagdev.org](http://www.nnyagdev.org).

The Northern New York Agricultural Development Program is a farmer-driven research and technical assistance program serving Clinton, Essex, Franklin, Jefferson, Lewis and St. Lawrence counties. The Program recently received \$600,000 in New York State funding.

#### MORE INFORMATION:

In a separate Northern NY trial in 2013, Adapt-N correctly identified the need for more nitrogen due to large spring N losses and resulted in a gain of 16 bushels of corn per acre. Similar results were seen in trials elsewhere in the state.

To evaluate the environmental impact of using Adapt-N to reduce excess nitrogen loss, drainage water samples were collected at research plots at the Cornell Willsboro Research Farm in Willsboro, NY. The samples indicated less N loss from fields under Adapt-N management.

Data and feedback from the use of Adapt-N on working farms has increased the tool's precision and user-friendliness with improvements to how soil type, drainage, manure application, previous crops, and the calculation of cost factors are modeled as well as user-interface improvements.

The Adapt-N team acknowledges the critically-useful suggestions provided by the farmers and crop consultants participating with the Northern New York Agricultural Development Program project.

Adapt-N use has been tested and adopted throughout the Northeast and Midwest. AgProfessional magazine named Adapt-N the Best New Product of the Year for 2012.