



WORKING ON WATER

The WPVGA collaborates with stakeholders to achieve sustainable groundwater quantity and quality

By Tamas Houlihan, Executive Director, WPVGA

Wisconsin's Central Sands region remains one of the most productive irrigated vegetable areas in the United States with top five rankings for potatoes, sweet corn, green beans, peas, carrots, cucumbers, beets for canning, and cabbage for sauerkraut.

This production, which is valued at nearly \$6 billion annually, would not be possible without irrigation. At the same time, concerns have been raised over the potential impact of irrigated agriculture on the groundwater aquifer and surface waters of the Central Sands.

In response, the Wisconsin Potato & Vegetable Growers Association (WPVGA) continues to bring together people, organizations and expertise to foster the sustainable use of water resources.

Voluntary conservation practices, groundwater monitoring, state-of-the-art technology and applied research are the focal points of the WPVGA's efforts.

The Association continues to engage in activities that consolidate and build on the existing knowledge base related to the hydrogeology of the Central Sands and other potato growing areas of Wisconsin.

2025-26 HIGHLIGHTS

- In 2025, the WPVGA Water Task Force provided funding for a multi-year project led by Assistant Professor and Extension Specialist in Agrohydrology Dr. Mallika Nocco of the University of Wisconsin (UW)-Madison Biological Systems Engineering Department.

Dr. Nocco's research will "Measure Fifteen Years of Actual Evapotranspiration [ET] in the Central Sands Using Eddy Covariance, Drones and Satellite Data." Dr. Nocco will advance this goal by measuring water and energy budgets in different potato and vegetable cropping systems in



Dr. Jed Colquhoun of the University of Wisconsin (UW)-Madison Department of Horticulture continued in-depth studies, in 2025, to investigate practical agronomic ways to include inter-seeded cover crops in potato and sweet corn on coarse textured soils. The goal is to determine if inter-seeded cover crops can uptake leached inputs such as nitrates and pesticides to help protect groundwater. Here, yellow mustard is inter-seeded with sweet corn as part of Dr. Colquhoun's research.

the Wisconsin Central Sands.

Dr. Nocco's team will instrument a movable eddy covariance tower on a trailer that is powered by a solar panel system for flexibility of locations around Central Wisconsin. The anticipated life of this tower is at least 15 years.

The tower will house an open-path gas analyzer and 3-dimensional sonic anemometer, net radiometer, soil heat fluxes, temperature/relative humidity gauges, and soil moisture sensors.

These instruments will be paired with drone and satellite measurements of evapotranspiration and crop growth to inform irrigation scheduling, crop water stress, and water productivity tools for the Central Sands to improve irrigation management.

They will also be used to evaluate water use from new crop varieties,

water-holding soil amendments, and interplanting trials. Laboratory analyses will be used to evaluate plant water availability.

Data will be shared with growers and the scientific community. The overarching research goal of the proposed project is to collect data to support precision irrigation management and water conservation in the Central Sands region of Wisconsin.

- In 2025, the WPVGA Water Task Force funded research by Dr. Steven Hall, assistant professor in the UW Department of Plant and Agroecosystem Sciences. His project is titled "Expanding On-Farm Nitrate Leaching Measurements to Evaluate Innovative Practices."

Dr. Hall will evaluate the potential of resin lysimeters (a simple, low-cost sampling method) to measure nitrate leaching in on-farm trials in comparison with equilibrium

tension lysimeters (a well-accepted but complex and expensive method).

Developing feasible and cost-effective methods to measure nitrate losses is critical for informing the adoption of effective management practices that benefit the long-term economic and environmental sustainability of the potato industry and the Central Sands region.

- In 2025, the WPVGA Water Task Force also contributed funding toward a project led by Dr. Inna Popova, assistant professor in the UW Department of Soil and Environmental Sciences, titled "Impacts of Jumping Worms on Nitrogen Leaching in Organic Potato Production Systems."

Jumping worms accelerate the breakdown of organic matter and alter nitrogen cycling, often

continued on pg. 28



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continued from pg. 27

resulting in excessive nitrate release and leaching.

The goal of this research is to generate foundational data on nitrogen leaching risk and amendment efficacy, enabling growers to make informed decisions about nutrient management and soil restoration in systems affected by jumping worm invasion.

- The WPVGA Water Task Force recently concluded a five-year research project with the UW Atmospheric and Oceanic Sciences Department looking at newer, more accurate and advanced methods of measuring evapotranspiration, which is the term used for crop water use.

This project was led by Dr. Ankur Desai and used the latest technology of an eddy covariance flux tower system to measure ET in an irrigated vegetable field as well as using another flux tower system to measure ET in a nearby forest.

Research results are being shared with growers to assist them in their irrigation management and scheduling regimes. Five years of data have also helped improve the Wisconsin Irrigation Scheduling Program by fine-tuning the ET measurements used in that system.

- Every year, the WPVGA funds several applied research projects led by Dr. Yi Wang, professor in the UW Department of Plant and Agroecosystem Sciences, and Dr. Matt Ruark, professor in the UW Department of Soil and Environmental Sciences.

In recent years, these studies included evaluating the performance of multiple potato varieties in low nitrogen environments as well as studying nitrate concentrations in irrigation water.



In 2025, the WPVGA Water Task Force funded research led by Dr. Steven Hall to evaluate the potential of resin lysimeters, which are a simple, low-cost sampling method, to measure nitrate leaching in on-farm trials in comparison to equilibrium tension lysimeters that are a well-accepted but complex and expensive method. Shown here, Dr. Hall (foreground) and a team member install resin accumulators in a hilled potato field to estimate nitrate leaching from field trials.

The research results provide important information for growers. It helps them develop improved nutrient management programs that account for nitrogen being applied in the irrigation water. It also helps identify new varieties that use less nitrogen and existing varieties that perform well with less nitrogen.

This research also includes the study of slow-release nitrogen products with a goal of reducing nitrate leaching into groundwater. These studies are being conducted on-farm as well as at the UW-Hancock Agricultural Research Station.

Dr. Ruark's current research studies the effect of the previous crop (corn or soybean) on the optimum nitrogen rate for potatoes grown

in the Central Sands. This research will update nitrogen fertilizer recommendations for potatoes based on the previous rotational crop.

Dr. Wang's current research focuses on developing an efficient platform that predicts and guides in-season potato nitrogen fertilization using remote sensing imagery. The goal is to investigate the possibility of guiding nitrogen management decision-making on farms using AI-driven techniques.

- As part of his annual WPVGA base funding, Dr. Jed Colquhoun of the UW Department of Horticulture continued in-depth studies, in 2025, to investigate practical agronomic ways to include inter-seeded cover crops in potato and sweet corn on coarse textured soils.

The goal is to determine if interseeded cover crops uptake leached inputs such as nitrates and pesticides to help protect groundwater.

Dr. Colquhoun's research also explores alternative rotational crops that require minimal nitrogen, pesticide or irrigation inputs.

- In 2025, the WPVGA was successful in receiving a fifth Producer-Led Watershed Protection Grant from the Wisconsin Department of Agriculture, Trade and Consumer Protection (WDATCP). Eight member farms are participating in the project, which is in the Little Plover River/Wisconsin River watershed.

Called the Central Wisconsin Farmers Collaborative, the group seeks to promote innovative conservation and stewardship practices that benefit the

watershed, landscape, and the land managers themselves through collaborative partnerships, farm-to-farm education programs, and other strategic actions.

Conservation practices employed by the group include the extensive use of cover crops, prairie and pollinator plantings, inter-seeding cover crops to reduce nitrate leaching, and no-till/minimum till practices.

There are also extensive wetlands restoration practices employed in this watershed. The group received funding again in 2026 and plans to recruit several more farms to join this year.

- A second Producer-Led Watershed Protection Grant group, Farmers of the Roche-A-Cri, formed in the Central Sands, in 2022, and received its fourth year of funding in 2025. The Farmers of the Roche-A-Cri includes six WPVGA member farms.

- The WPVGA continues to encourage more member farms to participate in the Producer-Led Watershed Protection Grant program.

Two more groups with WPVGA members were approved by WDATCP for Producer-Led Grants in 2025: one in the 14-Mile Creek Watershed and one in the Antigo potato growing region. These groups also received continued grant funding for 2026.

- Multiple WPVGA members are participating in the Commercial Nitrogen Optimization Pilot Program (NOPP) through WDATCP.

The NOPP was designed to encourage agricultural producers to develop innovative approaches to optimize the application of commercial nitrogen for a duration of at least two growing seasons.

The selected producers must collaborate with a UW System

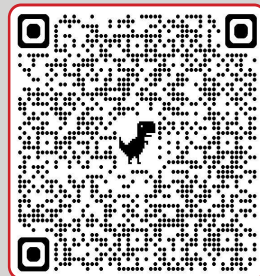
continued on pg. 30



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continued from pg. 29

institution, which will monitor the grant project on-site and conduct commercial nitrogen optimization field studies.

Coloma Farms received a NOPP Grant for 2024-'25, working with Dr. Hall, a water quality specialist, on the use of a liquid cover crop (glycerol) to reduce nitrate leaching.

Isherwood Farms received a 2024-'25 NOPP Grant on optimizing nitrogen in potatoes to reduce nitrogen leaching on sandy soil, and McCain Foods continued its work with a second NOPP Grant in 2024-'25 working with two WPVGA farms to optimize nitrogen use for potatoes in Central Wisconsin.

Four WPVGA member farms have been approved for NOPP Grant funding in 2026-'27 along with the Langlade County Agricultural Research Station, which will focus on optimizing potato nitrogen application rates under reduced phosphorus rates.

- The WPVGA continues to collaborate with the Village of Plover, the Wisconsin Wetlands Association, the Wisconsin Wildlife Federation, Wisconsin Department of Natural Resources (DNR), UW-Stevens Point, and others on the Little Plover River Watershed Enhancement Project.

This multi-party collaboration has improved the health and flow of the Little Plover River and the quality of life of the surrounding community.

The WPVGA recognizes that restoring the health of the river requires an array of on-the-ground practices and voluntary landowner participation, and is committed to utilizing a combination of protection, restoration and

management practices that ensures the project's success.

WPVGA member farm Myron Soik & Sons was instrumental in the success of this project by agreeing to take a vegetable field out of production and decommissioning a high capacity well near the headwaters of the Little Plover River.

A dairy farm in the Little Plover River Watershed, Feltz Family Farms, joined the WPVGA and has been actively involved in practices such as rotational grazing and ditch-filling to improve the Little Plover River Watershed.

- The WPVGA continues to maintain and monitor a network of privately-owned irrigation wells in the Central Sands to measure groundwater levels. The network currently consists of over 50 wells across multiple Central Wisconsin counties sampled one to three times per year.

The database is managed by GZA GeoEnvironmental, Inc., and information is available on the WPVGA website (www.wisconsinpotatoes.com).

- The WPVGA continues to collaborate with the University of Wisconsin and the DNR on an initiative to recognize and reward water conservation.

The Wisconsin Water Stewards Program establishes a baseline of water stewardship practices and assists growers in making continuous improvements in water conservation.

Growers have access to a broad range of expertise to help determine the best way to manage and conserve water resources on their individual farms. This has also become a component of the



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WPVGA's high-bar sustainability program known as Healthy Grown.

- The WPVGA continues to collect and post data from over 25 monitoring wells to continuously track fluctuations in groundwater at regular intervals across three areas designated as high risk for surface water impacts: the Little Plover River (Plover area), Long Lake (Plainfield area), and Pleasant Lake (Coloma area).

Groundwater elevations are posted at <https://wisa.cals.wisc.edu/> every three weeks.

All these WPVGA initiatives are working toward sustainable groundwater quantity and quality through evaluating and implementing strategies to increase the efficiency of irrigation and crop production while conserving the amount of water used and maintaining or improving water quality. **BCT**