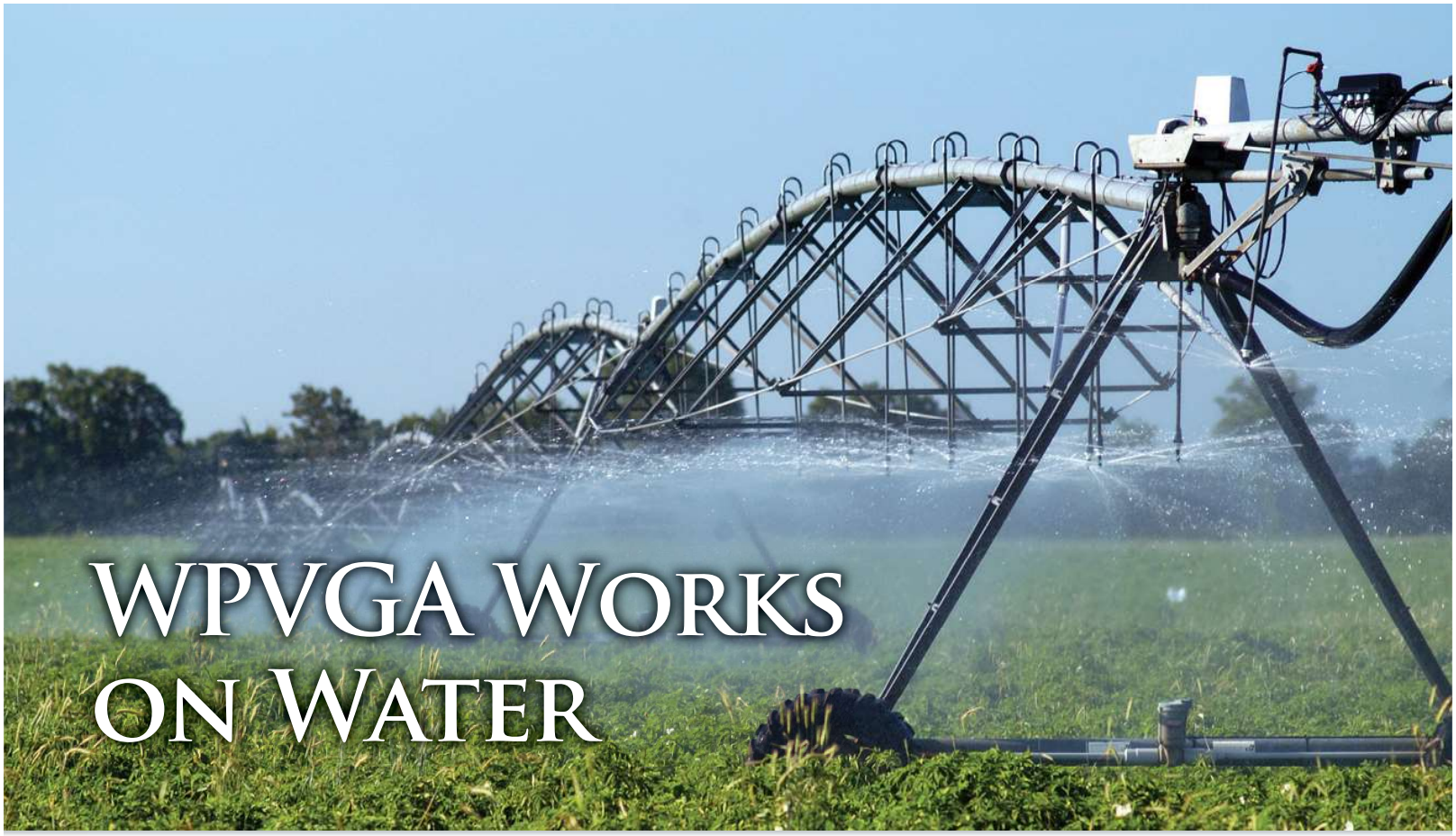

WPVGA Works on Water

Water quantity and quality issues remain top priorities

By Tamas Houlihan, WPVGA Executive Director

With the recent release of the Department of Natural Resources (DNR) Central Sands Lakes Study and the on-going process of the NR151 rule revisions related to nitrates in groundwater, the Wisconsin Potato & Vegetable Growers Association (WPVGA) is clearly focused on water issues.

I am happy to report that the WPVGA continues to collaborate with multiple stakeholders to achieve sustainable groundwater quantity and quality.

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

We are also a top-10 producer of onions and cucumbers for pickles. 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 WPVGA continues to bring together the people, organizations and expertise to foster the sustainable use of water resources. It is an example of collaboration involving state agencies, University of Wisconsin (UW) research scientists and the agriculture industry.

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. Among these activities are the following:

- Collaboration with the Village of Plover, the Wisconsin Wetlands Association, the Wisconsin Wildlife Federation, Wisconsin DNR, UW-Stevens Point and others on the Little Plover River Watershed Enhancement Project (LPRWEP).

  This multi-party collaboration is improving the health and flow of the Little Plover River (LPR) and the quality of life of the surrounding community.

  The WPVGA recognizes that

Above: Drop nozzles are used extensively on irrigation systems, allowing the water to be applied closer to the ground and reducing the amount of evaporation that can take place, thus conserving water.

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 will ensure the project's success.

- In cooperation with the DNR, the WPVGA continues to collect and post data from over 25 monitoring wells to continuously track fluctuations in groundwater levels at regular intervals across three areas designated as high risk for surface water impacts (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.

  The DNR received permission from the WPVGA to conduct the data collection and posting from the monitoring wells in the Plainfield and Coloma areas as part of the Central Sands Lakes Study component of 2017 Wisconsin Act 10, related to the potential impacts of groundwater withdrawals on three lakes in the Central Sands.

  This spring, the DNR released its findings, which identified precipitation as the primary factor affecting the fluctuation of lake levels.

  All three lakes included in the study, Long Lake, Plainfield Lake and Pleasant Lake, are presently several feet above their historic median levels.

- Ongoing collaboration on a research project with the UW Atmospheric and Oceanic Sciences Department looking at newer, more accurate and advanced methods of measuring evapotranspiration (ET).

  This project is being led by Dr. Ankur Desai and uses the latest

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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.

Three years of data show that the ET rates are higher (reflecting greater water use) in the pine forest than the irrigated vegetable field.

The DNR also used information from the Desai lab to accomplish tasks related to the lakes study component of 2017 Wisconsin Act 10.

An additional study will take place this summer using eddy covariance flux towers to calculate ET values in a non-irrigated corn field.

- Funding software maintenance to keep the Wisconsin Irrigation Scheduling Program (WISP) and the Agricultural Weather Data Service operational.

  Work is being conducted at the UW Biological Systems Engineering Department.

  The existing WISP software tracks a daily soil water balance to assist growers with irrigation water management.

Eddy covariance flux towers are being used in Central Wisconsin to accurately measure evapotranspiration (ET), which helps growers with their irrigation management.

The Desai lab is also working with the Biological Systems Department to fine-tune the WISP ET calculations.

- Maintaining and monitoring a network of privately-owned irrigation wells in the Central Sands to measure groundwater fluctuations.

  The network currently consists of over 50 wells across multiple Central Wisconsin counties sampled one to three times/year. The database is maintained 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 a new 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 WPVGA's high-bar sustainability program known as Healthy Grown.

- The WPVGA funds several applied research projects led by Dr. Yi Wang, UW professor of horticulture, and Dr. Matt Ruark, UW professor of soil science, looking at nitrate concentrations in irrigation water as well as evaluating the performance of multiple potato varieties in low nitrogen environments.

  The research results will provide important information for growers to help them develop improved nutrient management programs that account for nitrogen (N) being applied in the irrigation water, along with new varieties that use less nitrogen.

  This research also includes the study of slow-release nitrogen products with a goal of reducing nitrate leaching into groundwater.

- In 2021, four WPVGA farms will conduct on-farm research trials related to N use efficiency under the direction of Dr. Wang and Dr. Ruark. Each farm will use multiple N rates on three different potato varieties to identify varieties that perform well under low N rates.

- In the spring of 2021, the WPVGA approved funding for equipment to assist with a research project conducted by Kevin Masarik, Extension groundwater education specialist at UW-Stevens Point.

  The project is titled, "The use of sensor arrays to understand water dynamics, solute leaching and soil temperature below two fertilization methods of potato."

Ensuring that irrigation can supply adequate water to the potato crop, while minimizing the potential for water to transport solutes like nitrate to groundwater, is beneficial to the grower as well as the environment.

More information on the behavior of nitrate and other solutes in the soil profile during the growing season can be used to inform irrigation and fertilization strategies.

A current experiment is underway at the Hancock Agricultural Research Station that is investigating differences between fertilization practices on potato yield.

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Various treatments look at the effects of rate as well as timing of applications.

This work presents an opportunity to learn more about water and solute leaching dynamics as they occur throughout the growing season using detailed arrays of sensors.

The objectives of this project are to observe and quantify water movement, solute leaching and soil temperature differences between two fields that receive the same rate of fertilizer while altering the timing of when that fertilizer is applied.

- Also in 2021, the WPVGA was successful in receiving a Producer-Led Watershed Protection Grant from the Wisconsin Department of Agriculture, Trade and Consumer Protection.

  Six member farms are participating in the project, which is in the Little Plover River/Wisconsin River watershed.

Pictured near the Little Plover River are, from left to right, Bob Obma of Trout Unlimited, and potato growers Curt Soik and Nick Somers. The Little Plover River Watershed Enhancement Project has been a great success and a shining example of how cooperation and collaboration are more effective than regulation.

  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.

- The WPVGA is partnering with Discovery Farms Wisconsin on a producer-led project in the Antigo Flats, an area of 70,000 acres in Northcentral Wisconsin.

  The project is interested in documenting phosphorus (P) loss from runoff events, learning about stream flow, reducing P loads to the Spring Brook and Eau Claire River watersheds and evaluating the impact of in-field actions on water quality.

  Two edge-of-field surface monitoring sites are situated in Langlade County on seed potato operations.

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. BC'T