## University of Wisconsin-Madison

# Nutrient and Pest Management Program

## Strategic Plan Executive Summary

05/2022

NPM

College of Agricultural & Life Sciences
UNIVERSITY OF WISCONSIN–MADISON

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| **Mission** | The University of Wisconsin's Nutrient and Pest Management (NPM) Program works with Wisconsin farmers, researchers, agricultural professionals and citizens to provide research-based agricultural nutrient and pest management education and outreach on crop production practices that protect water quality, farm profitability and the state's diverse landscapes. |
| **Vision** | NPM's vision is to be Wisconsin's leader and strategic collaborative partner in science-based, agricultural nutrient and pest management education and outreach. This will be achieved by moving University of Wisconsin (UW) College of Agricultural Science (CALS) research to stakeholders through the promotion of resilient farms, landscapes and communities while innovating around new, emerging agricultural needs and initiatives. |
| **Values** | NPM strives for excellence in outreach and applied research by championing science-based agronomic management practices that address agricultural, environmental and societal sustainability. NPM plans on achieving this goal by developing innovative and relevant education and outreach that is: 1) Grounded in science; 2) Unbiased and transparent in its professional collaborations; 3) Open to critical thinking and healthy debate; 4) Respectful and inclusive to all; 5) Accountable to its diverse stakeholders; and 6) Continuously improving its quality. |
| **Approach** | NPM collaborates with diverse partners including UW System faculty and staff, government agencies, grower organizations, agricultural producers and non-government organizations (NGOs). NPM develops, designs and disseminates high-quality, innovative and educationally effective outreach materials for online, remote, hybrid and in-person learning environments. NPM also works closely with CALS Extension funded faculty to demonstrate applied research on Wisconsin farms and landscapes. |

## STRATEGIC PRIORITY AREAS AND GOALS

| Nutrient Management | Pest Management | Resilient Agriculture |
|---|---|---|
| Increase adoption of science-based, on-farm nutrient best management practices (BMPs) to improve agricultural production efficiencies, and to protect ground and surface water quality. | Develop, promote, and demonstrate science-based integrated pest management (IPM) for weeds, diseases and insects that address both current and emerging issues. | Develop, promote and disseminate science-based practices that promote soil health, benefit ecosystem services, slow climate change and increase soil conservation. |

For a comprehensive list of short- and long-term actions, see pages 5-6 of the ***Nutrient and Pest Management Program Strategic Plan***.

# Nutrient and Pest Management Program
## Strategic Plan

05/2022

NPM

College of Agricultural & Life Sciences
UNIVERSITY OF WISCONSIN–MADISON

*The University of Wisconsin-Madison (UW-Madison) Nutrient and Pest Management (NPM) Program is using this strategic plan to focus programmatic and administrative efforts for both the short-(<5 years) and long- (5-10 years) terms.*

*The goal of this document is solely to provide a framework for outreach and research for the strategic planning period.* ***How NPM staff use their initiative and skills to accomplish strategic plan efforts will continue to be dependent on the plans of individual staff and the program director.***

*The program director and staff will review this plan at the annual NPM winter retreat to ensure work is progressing in a timely manner.*

**NPM Program Background and Current Focus:** The NPM Program has been working for over 30 years as a proven and integral program within the UW-Madison, College of Agricultural and Life Sciences (CALS) with direct links and support from UW-Madison, Division of Extension (UW Extension). The NPM Program runs fiscally, administratively, and managerially under the UW-Madison, Department of Horticulture. The program provides essential services by working closely with UW faculty and staff, CALS Extension funded faculty and staff, and other statewide partners who have an agricultural focus within nutrient management, pest management, and agricultural production systems with a overall stratey of protecting and improving water quality, farm profitability and resilient landscapes.

NPM provides a necessary link for research/outreach/extension and is innovative in the development and production of cutting-edge educational tools that help extend the **Wisconsin Idea** for nutrient management, pest management and agricultural systems. NPM provides focused programmatic links for multiple CALS themes, including resilient agricultural systems, food production systems, healthy and sound ecosystems, food security in a changing climate, and ensuring local economic and community development. NPM provides a conduit between UW CALS and its clientele, including government agencies, grower organizations, agricultural producers and non-government organizations (NGOs). To ensure scientific integrity, NPM works with CALS and Extension funded factulty/staff to make sure that only research-based agricultural practices are promoted.

**Mission Statement:** The University of Wisconsin's Nutrient and Pest Management (NPM) Program works with Wisconsin farmers, researchers, agricultural professionals and citizens to provide research-based agricultural nutrient and pest management education and outreach on crop production practices that protect water quality, farm profitability and the state's diverse landscapes.

**Vision Statement:** NPM's vision is to be Wisconsin's leader and strategic collaborative partner in science-based, agricultural nutrient and pest management education and outreach. This will be achieved by moving CALS research to stakeholders through the promotion of resilient farms, landscapes and communities while innovating around new, emerging agricultural needs and initiatives.

**Values Statement:** NPM strives for excellence in outreach and applied research by championing science-based agronomic management practices that address agricultural, environmental and societal sustainability. NPM plans on achieving this goal by developing innovative and relevant education and outreach that is: 1) Grounded in science; 2) Unbiased and transparent in its professional collaborations; 3) Open to critical thinking and healthy debate; 4) Respectful and inclusive to all; 5) Accountable to its diverse stakeholders; and 6) Continuously improving its quality.

**NPM Staff Review and Skill Set:** NPM staff (one program manager, five regional outreach specialists, one Healthy Grown® and sustainability program coordinator, one editor and one information technology programming specialist) report to the program director. Each staff member has a unique skill set but works together as a collegial, cohesive unit to provide programming based on the areas of emphasis developed in this plan by:

- Providing links between CALS Extension funded faculty and staff to aid in outreach and education when needed.
- Assisting with UW Extension education as it relates to nutrient and pest management by developing, producing, and delivering presentations at educational meetings around the state.
- Collaborating with CALS Extension funded faculty for research needs (on-farm and on research stations) to design, collect data, document and analyze data and report results in written, electronic and in-person formats.
- Stewarding research trials and connecting faculty-led research to farmers, UW Extension outreach specialists and other public and professional trainers for direct educational trainings.
- Integrally working with CALS Extension funded faculty to develop timely, effective, easy to use, grower-friendly research-based outreach and educational tools.
- Providing direct contacts, mentoring (short-term and/or long-term), collaboration and training for UW Extension (both with regional and state-wide outreach) and local-based conservation staff to receive information in nutrient and pest management.
- Linking UW research and outreach development to ease farmer concerns of regulatory factors and facilitate improved understanding of techniques to meet regulation standards.

These efforts do require an ever-increasing programmatic effort with expanding collaborations; future staff capacity may have to increase to address workload and effort concerns.

**Priority Setting:** Currently the NPM Program develops plans and sets priorities at monthly staff meetings and an annual retreat. External feedback and additional direction are also received via the UW Extension Crops and Soils and AgWater programs along with communities of practice within each program. NPM also sets priorities by working with UW Extension outreach specialists, county Land and Water Conservation Department staff, Department of Agriculture staff, USDA-Natural Resources Conservation Service staff, UW-Madison CALS faculty collaborators, and other program sponsors. NPM shares a technical advisory committee with the Integrated Pest Management (IPM) program and the Pesticide Applicator Training (PAT) program. The committee meets twice per calendar year to discuss programmatic needs, current and emerging agricultural issues and priority setting. Input from such diverse groups of interest allows NPM's educational programming to be flexible in response to emerging issues while prioritizing key industry needs.

**Program Stakeholder Review:** The NPM Program completed a ten-year program review in 2019. During that time, stakeholders provided invaluable input into the direction of the program. Feedback was overall positive, but some priority issues were raised that helped create the focus for this strategic effort. Reviewers provided an assessment that suggested to: 1) Work to identify the greatest strengths and priority issues in agriculture, which the program is well-positioned to address; 2) Develop reporting metrics to formalize impacts; 3) Align NPM staff expertise to funding and leverage those funds with other efforts; 4) Expand alignment with funding partners for planning; 5) Work on a process to expand CALS Extension funded faculty engagement; and 6) Formalize how projects are prioritized.

Between 2020-2022, NPM worked toward these suggested goals. NPM staff and the program director are improving alignment with institutional funding partners and expanding engagement with new CALS Extension funded faculty and staff. NPM has developed and implemented a formalized reporting metric to position staff and projects in a coordinated and effective manner. As NPM continues to expand, it will strategically work with new partners to develop a more formalized system to determine how projects are prioritized.

## NPM Program SWOT Analysis

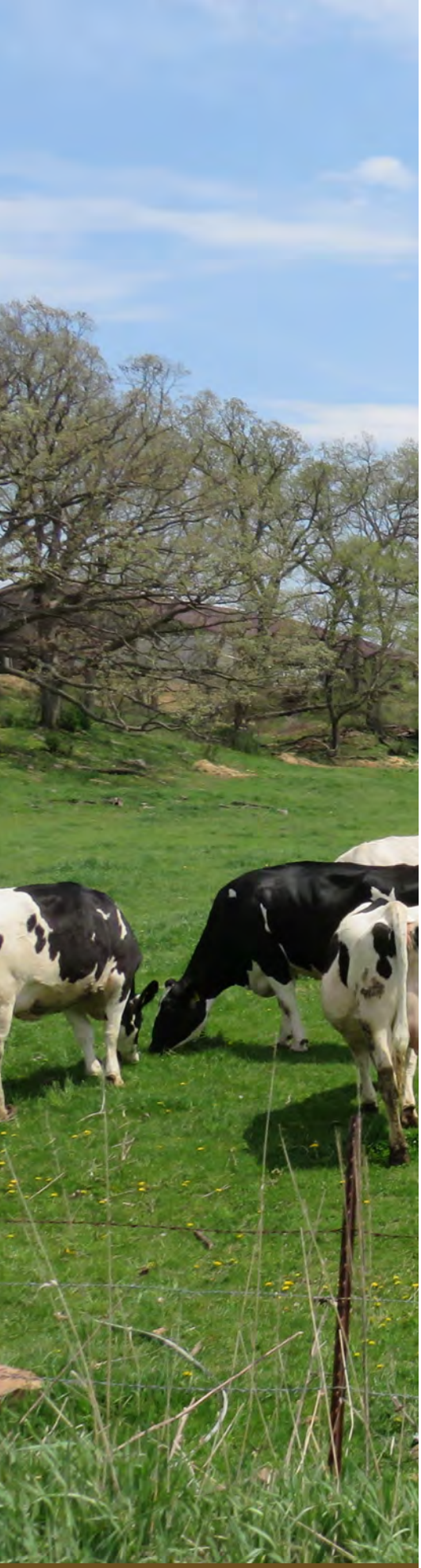
A strengths, weaknesses, opportunities and threats matrix was used to guide strategic planning and goal development.

| Strengths | Weaknesses |
|---|---|
| Research-based, scientific and educational outputs. | Reduction of staff resulting in more work for existing staff, limiting time for extra creativity. |
| Knowledgeable staff with expertise in nutrient management, soil management, soil health, cropping systems, vegetable production, IPM, weed science, entomology and plant pathology. | Computer programming needs, need for a full-time data science professional. |
| Innovative, educational and informative outreach approaches. | Some relationships NPM engages in are not reciprocal; need to be strategic in relationship building to not stretch the lean, nimble team too thin while maintaining our identity and looking for longer-term value from partnerships. |
| Adaptiveness and responsiveness to current/emerging issues. | NPM's trajectory of more targeted funding might reduce the ability to be innovative; tradeoff is that funding is a safety net. |
| Direct linkage to CALS Extension funded faculty and staff (UW-Madison, UW-Platteville, UW-River Falls, UW-Stevens Point, UW-Green Bay, UW-Stout, etc.). | Focus on research reduces ability to teach and conduct successful outreach; society undervalues teaching in general. |
| Knowledge based in farming systems that provide relationships and communications to the farming community and Extension colleagues. | Staff reluctance to developing new relationships when there is limited value in return to the NPM mission, especially with time constraints and workload challenges. |
| Relationships with local conservation contacts (NRCS, Land Conservation, etc.). | |
| Strong leadership to foster current future program direction and needs. | |

| Opportunities | Threats |
|---|---|
| Expand online learning opportunities and new educational options. | Maintenance of current state funding levels while trying to expand other opportunities; as funding in one area declines, NPM can no longer put efforts in those area(s). |
| Interact and program with new Ag Water UW Extension outreach specialists and other new partners. | Outside entities providing educational material (not always research-based). |
| Provide back-to-basics education for nutrient, pest management, and resilient agricultural systems. | Lack of county agents facilitating local direct contacts hinder research and outreach for NPM. |
| Engage and program with new hires and other faculty who work under NPM's strategic areas. | Need for NPM CALS and Extension-funded faculty and staff to build relationships and mentor extension colleagues reduces the time allowable for outreach and research activities. |
| Evolve with the regionalization of extension; NPM retains identify while creating connections to work with UW Extension outreach specialists. | Not enough expertise in current NPM staff for some water quality efforts (e.g., hydrology, geology), but with UW's focus on new faculty positions NPM can link and work with them to expand knowledge base. |
| Improve NPM marketing and branding; maintain and expand NPM presence in outreach, teaching and research efforts across the UW system. | |
| Expand water quality programming efforts. | |
| Differentiate UW education from the ag-industry; NPM maintains non-biased, research outcomes of nutrient and pest management products and education. | |
| Maintain outreach positions to cover statewide needs; add precision agriculture and data-science professional to staff. | |

**Strategic Priority Areas and Goals:** For the current strategic planning period, NPM will prioritize programmatic efforts around the over-arching areas of nutrient management, pest management, innovative outreach, collaborations and effective applied research with corresponding strategic goals as follows:

1. **Nutrient Management:** Increase adoption of science-based, on-farm nutrient best management practices (BMPs) to improve agricultural production efficiencies, and to protect ground and surface water quality.
2. **Pest Management:** Develop, promote, and demonstrate science-based integrated pest management (IPM) for weeds, diseases and insects that address both current and emerging issues.
3. **Resilient Agriculture:** Develop, promote and disseminate science-based practices that promote soil health, benefit ecosystem services, slow climate change and increase soil conservation.



**Approach:** NPM collaborates with diverse partners including UW System faculty and staff, government agencies, grower organizations, agricultural producers and non-government organizations (NGOs). NPM develops, designs and disseminates high-quality, innovative and educationally effective outreach materials for online, remote, hybrid and in-person learning environments. NPM also works closely with CALS Extension funded faculty to demonstrate applied research on Wisconsin farms and landscapes.

**Action Plans, Priorities, and Projects:** Ultimately, project prioritization must relate to the strategic priority areas and goals, and should fit under existing and planned NPM expertise. Links with project partners or new initiatives will be prioritized based on program fit, and outreach designed under the action plans outlined in this document. ***Specific actions plans and projects are described below, but these are meant to be flexible and not all-encompassing. This will allow NPM staff to be nimble and to ensure there is room for other options as they arise, which may slightly alter programming plans but still be under the strategic priority areas and goals.*** These alterations could come from new funding opportunities, links to new faculty or UW programs, and/or new agricultural outreach priorities that may arise during this strategic planning period.

Priorities and timelines are organized for actions to be considered under each NPM overarching goal, and time-frames listed are considered short-term (< 5 years) and long-term (5-10 years). Details for priorities and action plans NPM overarching goals are:

## NUTRIENT MANAGEMENT

***Increase adoption of science-based, on-farm nutrient best management practices (BMPs) to improve agricultural production efficiencies, and to protect ground and surface water quality.***

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|---|---|
| SHORT-TERM actions | **Focus on water quality concerns,** specifically nitrogen and phosphorus losses. Link best management practice adoption, nutrient management planning and research/educational programs around water quality goals. Maintain and enhance existing staff resources. Steward existing nutrient management related programming commitments, relationships, and collaborations with DATCP, Land and Water Conservation Departments and NRCS. |
| | **Connect with new and existing CALS Extension funded faculty and key industry partners** to develop and implement nutrient management outreach initiatives. |
| | **Collaborate with new initiatives** including the UW Extension AgWater Program by developing a communication system to coordinate on how NPM and AgWater can benefit from each other's expertise and contacts, and amplify education and outreach based on those discussions. |
| | **Provide leadership** with government (DATCP, NRCS, WDNR, etc.) and industry partners to develop educational outreach on the interactions between nutrient management, water quality, conservation and soil health. Progress on this is already being made during bi-annual technical advisory meetings and staff working with producer-led watershed groups. |
| | **Enhance staff knowledge and expertise** through engaging in continued professional development regarding emerging soil fertility science, nutrient management strategies and technologies, pertinent local, state and national regulations, and initiatives pertaining to agricultural nutrient use and water quality. |
| | **Develop cutting-edge educational materials** and approaches for traditional and online delivery, including mobile applications, videos, field days and virtual events. Continue to partner with the SnapPlus Program (Wisconsin's nutrient management software) to develop and deliver industry leading nutrient management training and planning. |
| LONG-TERM actions | **Collaborate with CALS UW Extension funded soils and AgWater Program faculty and staff** to develop research-based educational programs that address climate resiliency through the adoption of nutrient management practices, soil health strategies and conservation programs. |
| | **Keep abreast of new and changing nutrient management regulations** to aid staff in modifying or creating outreach materials and programming used to increase grower understanding of those changes. Recently staff was involved in the development of the comprehensive economic analysis of the Wisconsin Department of Natural Resources (WDNR) proposed NR151 rule change. |

## PEST MANAGEMENT

*Develop, promote, and demonstrate science-based integrated pest management (IPM) for weeds, diseases and insects that address both current and emerging issues.*

**SHORT-TERM actions**

**Expand the IPM focus of the program** and make sure staff are working with many agricultural and pest management faculty on outreach programs. NPM's program director has worked with the Integrated Pest Management (IPM) program to better align NPM and IPM programmatically, and for the next three years, some staff will have partial IPM funds to complete outreach work. In the next five years, NPM plans to increase IPM partnerships and collaborate on new and innovative outreach projects in the pest management realm. Some examples include staff from Agronomy, Horticulture, Plant Pathology and Entomology to expand IPM programming outreach potential.

**Strategically promote current IPM tools and resources.** Examples include timely social media promotion, development and dissemination of "proof of practice" content and local distribution through secondhand contacts (local email chains, producer-led groups, county contacts, etc.).

**LONG-TERM actions**

**Look at expanding staff focus to expand IPM programming and outreach** with new UW faculty initiatives when applicable in their areas of expertise and within the NPM goals. Staff can leverage existing outreach programs with these new efforts.

**Develop new, sustainable IPM methods that reduce pesticide inputs and pesticide contamination in the environment.** Methods may include new application technologies, new plant genotypes and precision agriculture techniques such as site-specific modeling and decision support tools.

## RESILIENT AGRICULTURE

*Develop, promote and disseminate science-based practices that promote soil health, benefit ecosystem services, slow climate change and increase soil conservation.*

**SHORT-TERM actions**

**Partner with university and industry leaders engaged in farmer outreach** to provide leadership and support for regional/statewide education efforts to improve farm efficiencies, resiliency, and environmental sustainability in response to climate change, economic and natural resource challenges.

**Promote conservation priorities** and work with partners to expand outreach opportunities for resilient agriculture systems. An example of this would be NPM's current work with expanding the Wisconsin Cover Crops Research and Outreach Project (CCROP) effort where NPM staff has worked to expand their outreach footprint.

**Create relationships to be considered as the extension/outreach arm for grant funds** with these faculty/industry partners. Regarding the comments that the NPM Program received from the ten-year review process, NPM is keenly aware of the need to establish and re-establish relationships with CALS Extension funded faculty and staff, USDA personnel, Division of Extension outreach specialists, and cooperators at DATCP. To that end, NPM has made a significant and successful push to solidify new working relationships on campus and beyond. NPM has new working grant agreements with the USDA Dairy Forage Research center to study alfalfa interseeding in corn and how the process affects nutrient management on-farm. NPM will continue to build these efforts further to involve newly hired CALS Extension funded and other UW faculty and staff over the next five years.

**Become an integral support team for the new CALS Extension funded faculty statewide and regional outreach specialists** by being liaisons to regions between UW research efforts, outreach educational program and on-farm research needs. NPM Staff will work with new UW Extension outreach specialists to develop combined outreach opportunities for nutrient and pest management issues. Current examples include work between NPM staff and UW Extension cranberry outreach specialist on new IPM modules for online trainings. Similar approaches can be used for multiple program areas (nutrient management, soil health, etc.) and in development of outreach (educational functions, publications, online trainings, etc.).

**LONG-TERM actions**

**Focus on local solutions, precision agricultural and site-specific management** and work on collaborations to provide education in these areas. Education for these include best management approaches, IPM, farm systems, precision agriculture and production needs.

**Continue and expand work with producer-led initiatives** that work with farmers to develop new approaches and locally-based outreach efforts.

**Support for existing and new, novel positions:** NPM must maintain relevant positions that are complementary to both the CALS and UW Extension missions benefitting Wisconsin, yet not redundant with existing expertise. Traditionally, funding was provided for regional outreach specialists who serve not only their designated region, but also the entire state, as each specialist brings a unique specialty and skillset. NPM proposes to continue this model but place focus on new regional specialists being strategically aligned with UW Extension outreach specialists, CALS Extension funded faculty researchers and the statewide needs for agricultural research and outreach. For example, NPM has an open position in the southeastern region of the state and proposes that this position be replaced with an outreach specialist with expertise in precision agriculture. This would be complementary to expertise on the UW-Madison campus and meet the unique needs of precision nutrient and pesticide applications in the southeastern region of Wisconsin, while also providing expertise statewide. This NPM specialist would also be positioned to work well with the UW Extension Agwater specialist assigned to that part of the state. Thus, NPM has prioritized two main areas of expertise to complement and amplify efforts of current staff:

1. **Precision agriculture outreach specialist:** Focus on precision agriculture includes work on variable rate technologies and with promoting new ideas and technologies for both nutrient and pest management. This would fit into an emergent agricultural theme and could expand faculty linkages into other UW departments. NPM envisions this filling the currently open position in southeast Wisconsin.
2. **Data scientist:** NPM staff envisions programmatic efforts in 'big data' as a key piece in advancing agriculture into the 21st century. Mitigating environmental problems in agriculture will be dependent on dense datasets and statistical analysis. To address these needs and to be prepared for the future, a Madison-based staff programmer would be integral in supporting the mission of CALS and research of CALS Extension funded faculty by offering applications readily available to agricultural clientele around the state. This might include continued work on smartphone applications and developing artificial intelligence (AI) systems.

NPM's program director will work with administration, faculty partners and grantors to provide funds for maintenance of current staff and expansion of new positions as described above.

**Anticipated Outcomes:** This strategic plan lays out NPM Program priorities, programmatic foci and includes ideas for expansion and new initiatives. It details how new collaborations and projects can be incorporated into the NPM Program and looks at options for future stable funding outcomes that could be achieved.

This plan will be reviewed annually by NPM's program director and staff, and metrics will be measured based on this plan. This will take place each year during the annual NPM Program's retreat and be updated as needed; this plan is anticipated to help prioritize the NPM Program's short-term (<5 years) and long-term (5-10 years) projects.

For more information about the NPM Program and contact information, please visit:
**ipcm.wisc.edu**