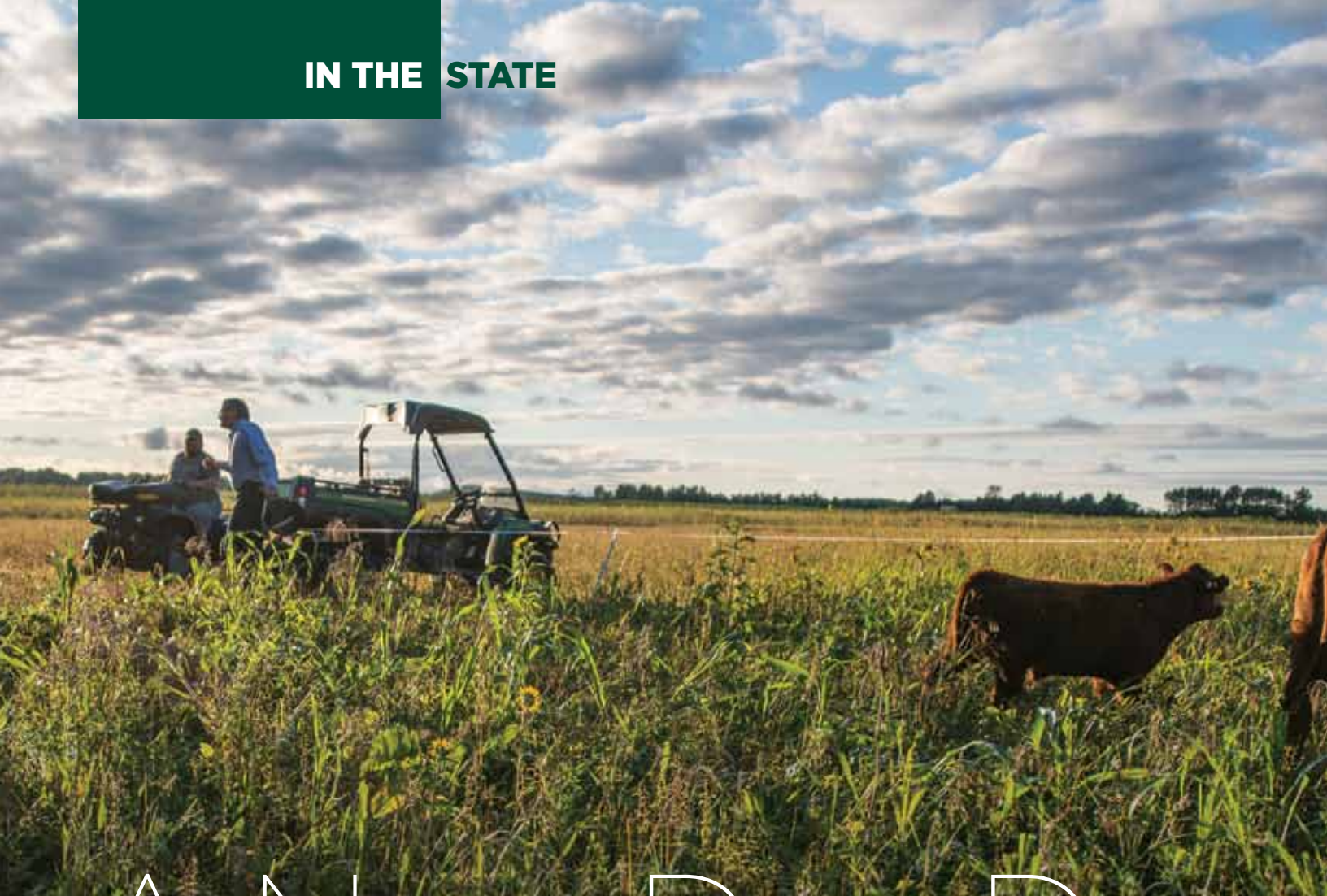

A New Day Daw

Research center adjusts mission, vision to better serve

BY NATASHA BERRYMAN
Writer

ABOVE: Staff at the MSU Upper Peninsula Research and Extension Center in Chatham, Mich. get an early start to the morning, repairing fencing and moving cattle from one field to another.

Established in 1899, the Upper Peninsula Research Center (UPRC) is the oldest of the 13 outlying Michigan State University (MSU) AgBioResearch centers. For more than a century, it has played an integral role in providing insight to support agriculture producers in Michigan's northernmost region. In 2012, the UPRC became the subject of a formal review initiated by MSU AgBioResearch. Administrators questioned the research productivity of the center and the costs to keep the facility operating in light of a 15 percent decrease in state funding.

ning: Upper Peninsula

"Research at UPREC now focuses on three main goals: improving soil health, integrating crop and livestock systems, and strengthening local food systems."

— Ashley McFarland

As a result of the review, the center is operating under a new mission and vision, as well as a new name — Upper Peninsula Research and Extension Center (UPREC). A team of staff members and scientists is committed to taking a holistic approach to building an integrated food system in Michigan's Upper Peninsula (U.P.). Their efforts are in direct response to the unique food, forage and soil challenges of this particular region.

Embracing new systems

In September 2012, a review committee evaluated UPREC and provided recommendations to guide the continued, long-term success of the center. During the process, committee members met with and received considerable input from U.P. stakeholders on the need for agricultural knowledge, training and educational opportunities specific to the region.

On the basis of the review, the center was restructured, renamed and assumed a new research mission: to root a value-added food system in healthy soil, holistic management practices and experiential education. In addition, UPREC was tasked to become the hub for Extension activities across the Upper Peninsula.

Ashley McFarland, a former University of Idaho Extension educator, was named center coordinator and MSU Extension educator in March, and she joined UPREC to implement this new plan with the help of **Paul Naasz**, operations manager at the center for 28 years. McFarland will coordinate research and Extension projects led by an animal scientist, an agronomist, an agriculture educator and a horticulturist to develop a food system custom-built for the U.P.

"Research at UPREC now focuses on three main goals: improving soil health, integrating crop and livestock systems, and strengthening local food systems," McFarland said.

Researchers at the center focus on developing management systems that enhance soil health.

"Often, the soil piece is overlooked because many think that they just have to work with the hand they were dealt,"

TOP: Ashley McFarland, center coordinator for the MSU Upper Peninsula Research and Extension Center, said that when she first visited the center she was impressed by the beauty of the farm and the staff's dedication to improve agriculture.

BOTTOM: Paul Naasz, operations manager, said when the center was first established in 1899, researchers planted "everything you could imagine" to see what would thrive in the Upper Peninsula's climate.

McFarland explained. "So, many of them invest in various inputs, such as fertilizer and lime. However, lowering your inputs can sometimes increase your profitability. Instead of adding nutrients to the soil and then mining them back out, we are exploring ways to encourage the soil to build its own nutrients, improve the soil organic matter and increase microbial activity.

"We've recently seen a growing interest in vegetable production and in using hoop houses to extend the growing season," said McFarland. "There's also interest in small grain production, which, because of the cool, moist climate of the U.P., could be very successful in this region."

John Baker, MSU AgBioResearch associate director, oversaw the review process. He said he is pleased with the new efforts

UPPER PENINSULA RESEARCH AND EXTENSION CENTER

Challenges prompting review in 2012:

- 15 percent cut in state funding for fiscal year 2011-12.
- Six-hour drive from MSU campus.
- No tenured MSU faculty members onsite since 1996.
- Lack of shared vision and leadership.

Moving in a new direction:

- From 1912 to 2010, the facility primarily focused on beef and dairy cattle. In 2012, a review committee recommended that the center would be better utilized if it offered place-based agricultural solutions for emerging markets in the U.P.

Long-term objectives identified:

- Improve soil quality to enhance productivity of U.P. agricultural lands.
- Conduct research that demonstrates the costs and benefits of integrated crop and livestock systems, including grass-based livestock production. Establish collaboration with MSU Lake City Research Center to strengthen these endeavors.
- Develop research tied to the educational needs of regional food systems in the U.P. that contributes to community sustainability and links to the other objectives.

MSU faculty coordinators appointed:

- Jason Rowntree, Department of Animal Science (livestock systems).
- Kim Cassida, Department of Plant, Soil and Microbial Sciences (plant systems).
- Matt Raven, Department of Community Sustainability

Name change:

- Dubbed the "Upper Peninsula Research and Extension Center" to better reflect the outreach endeavors and involvement of MSU Extension at the facility.

Center coordinator announced:

- Ashley McFarland, a former University of Idaho Extension educator, was hired to implement the new mission and vision.

already under way.

"I'm confident the agriculture industry in the U.P. is going to see the benefits from these changes at UPREC," he said. "It is my hope that we will soon start to see some of the findings applied directly to nearby farms."

"UPREC is already becoming a magnet for a variety of Extension events led by educators from across the U.P.," observed **Stephen Lovejoy**, MSU Extension associate director. "Their efforts will help disseminate the research results of the faculty and staff associated with the center."

Building wholesome foundations

On most farms, there is little crossover between livestock agriculture and cropping systems. **Jason Rowntree**, MSU AgBioResearch animal scientist, and **Kim Cassida**, MSU AgBioResearch agronomist, are collaborating to investigate the impact of integrating the two.

"One of our goals is to improve soil health and biodiversity by interfacing plants and animals in a way that won't compromise profitability," explained Rowntree, MSU assistant professor of animal science. "The research at UPREC is careful to explore management practices that increase the producer's profitability. We want to engage livestock in our cropping systems so farmers can decrease the amount of nitrogen and other inputs they've traditionally invested in to have success."

To accomplish this goal, Rowntree and Cassida are employing cover crop rotations and alternative beef cattle management practices to create a system that replenishes nutrients in the soil.

In preparation for the study that will launch in 2014, 120 acres of land were planted with a mix of 11 cover crops, including sunflower, safflower and crimson clover. A herd of red Angus cattle was brought in to graze the fields once the plants were full-grown.

Rotating through six 0.4-acre paddocks over the course of a day, the herd eats its fill of the cover crops and tramples what remains. This process scatters a green manure over the pasture and puts roughly 300,000 pounds of grazing pressure per acre onto the soil.

"In the 2014 study, we'll have several treatments for the land, ranging from 100 percent crops to 100 percent pastured animals with mixed gradations in between," said Cassida, MSU professor of plant, soil and microbial sciences. "We'll evaluate how the different crop-and-animal rotations affect soil to see which ratio is most effective at adding nitrogen, soil organic matter and the like."

"Embracing biodiversity and incorporating cover crops has the potential to improve the water-holding capacity of the soil, its organic matter and ultimately overall production," Rowntree added. "Not only do we see benefits belowground in the form of better soil, but we also benefit aboveground in a number of ways."

Farms become more cost-efficient, have greater longevity, rely on fewer natural resources to produce food and have a positive ecological impact, he explained.

Cassida, who is also an MSU Extension forage specialist, noted that the U.P.'s climate is a major hurdle to producers interested in growing crops. Part of her research focuses on conducting variety trials to identify plants that are well-suited for the U.P. and the crop-and-animal rotations the research team is refining.

Traditionally, variety trials test an assortment of plants to measure performance in a given environment and to capture growth and yield data. A UPREC trial currently testing 18 varieties of malting barley goes beyond those measures to evaluate the quality of the plant for its intended use.

Chris Kapp, UPREC research assistant, explained that there is strong interest from Michigan's craft brewing industry in sourcing locally grown barley. This is just one example of how the UPREC staff is working to identify forages that are climate-compatible, add nutrients to the land and have cash value. Cassida explained that the group also plans to work with specialty wheat for baking and other food

processing industries.

"If we can model a successful system that makes it possible to grow healthful, nutrient-dense foods with lower input costs, it's a win-win for everyone involved," Rowntree concluded. "The beauty of what we're doing is that we can take this a step further and incorporate hoop houses and an incubator farm into the loop, resulting in a holistic, resilient food system for a region facing several challenges."

Engaging people to enhance communities

As a demonstration of the commitment to help residents in the U.P. overcome agricultural challenges and increase food security, the restructuring of UPREC includes education and outreach components that emphasize engaging youth, families and students.

"If we want to increase agricultural productivity in the U.P., we have to have young people returning to fill those jobs the industry would undoubtedly create," McFarland explained. "It's also important to communicate that it is possible to have a small farm and still be profitable."

McFarland explained that the U.P. is well-positioned to support small and homestead-style farms, both of which she described as valuable components of the agriculture sector. UPREC researchers and staff members are working to make the center a source of direction for those interested in breaking into small-scale farming.

Matt Raven, MSU AgBioResearch agriculture educator, and **John Biernbaum**, MSU AgBioResearch horticulturist, are helping to meet this goal by developing an extended-season farming model that works well in the U.P. The model will be used as the basis for an incubator farm – a low-risk, experiential learning tool for students and community members who are interested in entering the agriculture market or adopting the practices on their farms.

"It's important to look at how we can make local communities more food-secure," said Raven, MSU professor of community sustainability. "We're looking at taking the north farm at UPREC and making it an education center revolving around local food systems. We plan to employ intensive agriculture systems that focus primarily on vegetable production using hoop houses."

Raven's goal is to integrate UPREC research with education and outreach to offer both formal and informal educational opportunities to the surrounding community and neighboring educational institutions.

Interested in understanding how technologies and innovations are adopted, Raven said a key component of his work at the center will focus on identifying the tensions that exist between how farming is currently done and how it might be done in the future.

"We want to mindfully look at agriculture and food systems in a holistic way, integrating the parts while being careful not to forget the people component," he explained. "My role as a social scientist is to make sure the communities and social systems already in place are connected to and compatible with the research."

"We'll use the lessons we've learned over the past 10 years at the MSU Student Organic Farm to help communities in the region use year-round, small-scale diversified farming techniques to increase the availability of fresh, local vegetables," Biernbaum added.

Biernbaum is especially excited about the opportunity to use hoop houses in a northern latitude where there

TOP: Jason Rowntree, MSU assistant professor of animal science, explained that a systems approach to agriculture allows researchers to embrace variability and effectively study how the components of the system affect one another.

CENTER: John Baker, MSU AgBioResearch associate director, said long-term plans for the center include coordinating research with similar facilities in Wisconsin and Minnesota, and partnering with other Upper Peninsula colleges and universities. .

BOTTOM: Kim Cassida, MSU professor of plant, soil and microbial sciences and MSU Extension forage specialist, explained that forage crops build nutrient and carbon levels in soil, fostering success for cash crops that are planted in the same rotation.

TOP LEFT: Chris Kapp, UPREC research assistant, has been conducting barley research at the center for seven years. He hopes to find a variety that is well suited for the Upper Peninsula and appeals to the state's growing number of craft brewers.

RIGHT: Matt Raven, MSU professor of community sustainability, plans to leverage UPREC's location to expand education and outreach opportunities to a wide range of people in the Upper Peninsula.

BOTTOM LEFT: John Biernbaum (right), MSU professor of horticulture, wants to help Upper Peninsula communities become more food secure by optimizing hoop houses to withstand the cool, northern climate.

is significantly less light and cooler temperatures than southern latitudes.

"It looks like it will work," he said. "There are already some farmers in the area using hoop houses to extend their growing season, but it will be a good challenge to optimize them so that U.P. residents can get the most out of the structures."

Eventually he and the other researchers will incorporate hogs, poultry and ruminants such as sheep or goats into the incubator farm system, which will be established at the north end of the farm.

In tune with the overarching mission of the center, the crop-and-animal system from the south end of the farm will also be integrated with the incubator farm. For instance, the cattle's winter manure will be stored adjacent to the hoop houses and used to make compost, Rowntree explained.

"One of the most important concerns we have when we step back and look at the big picture is the health of the people who live in the U.P.," Biernbaum concluded. "We want to give them the healthiest food we can. This integrated model builds food security and gets more people involved in agriculture."

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>
> *— John Biernbaum*

Preparing for an integrated future

No longer a facility that focuses solely on one facet of agriculture, the Upper Peninsula Research and Extension Center hopes to become a hub for integrated crop and livestock research in Michigan's Upper Peninsula.

"The face of agriculture is changing in the U.P.," McFarland said. "And it's important to have a research center here that provides interface between the university and the surrounding community. It's also important to have a center here because it allows us to do research that farmers in the area may not have the time or resources to do on their own."

She explained that UPREC is more than cattle, crops or hoop houses — the center is a diversified system that partners with the people who might employ its practices and aims to positively affect farm profitability.

"That's the emphasis at this farm," McFarland concluded. "We're diversified, we're profitable, and we're literally getting back to the root of it all — our soil."

For more information on the Upper Peninsula Research and Extension Center, visit agbioresearch.msu.edu/centers/uprc.

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