



**Statement of Kelly F. Millenbah, Ph.D., Interim Dean  
Michigan State University College of Agriculture and Natural Resources**

**Before the**

**United States Senate Committee on Agriculture, Nutrition and Forestry**

**April 29<sup>th</sup>, 2022**

Chairwoman Stabenow, Ranking Member Boozman, invited guests and witnesses here with us today, on behalf of Michigan State University (MSU), I wish to thank you for the opportunity to host the first 2023 Farm Bill hearing and to highlight its importance to growing jobs and economic opportunities in food production and food security, as well as addressing solutions to climate change and environmental conservation in Michigan and beyond.

As Interim Dean in the College of Agriculture and Natural Resources, I oversee the college that also includes MSU Extension and AgBioResearch. Between these units, we have a presence of outreach and research in all of Michigan's 83 counties, partner on positions within six colleges at MSU, and are engaged in studies impacting regions worldwide.

Founded in 1855 on the land-grant mission of teaching, outreach, and research, MSU is the first agricultural college of its kind in the nation. It has long served as a prototype for land-grant institutions under the Morrill Act, enacted by President Abraham Lincoln. In 1888, Michigan State University also became one of the first U.S. institutions to create a network of agricultural experiment stations where research trials and field studies are conducted on behalf of farmers. In 1914, Congress passed the Smith-Lever Act, which created the Cooperative Extension System and directed the nation's land-grant universities to oversee the outreach work.

I am honored and pleased to welcome you today to the new Michigan State University STEM Teaching and Learning Facility that combines historical and leading-edge elements in a transformative space for Spartan students and educators. What a fitting place to kick off the Farm Bill hearings. Our new building is the 73-year-old Shaw Lane Power Plant. Although decommissioned in 1975, the power plant has found a fitting new home. The building that once powered the campus is now empowering Spartans to innovate ways to learn and share knowledge about science, technology, engineering and mathematics, or STEM, and that includes the College of Agriculture and Natural Resources.

The STEM Teaching and Learning Facility, much like Michigan State University in general, is more than a place where students attend classes. It's a place where tradition meets innovation and where Spartans

learn they have the prowess to better the world. I assure you that the relevance of teaching, research and outreach has never waned. Despite the pandemic, it has been our charge to continue advancements pertaining to food, health and the environment and we take this charge very seriously.

There is perhaps no greater time to be involved in research pertaining to sustainable and nutritious food production and improving health and nutrition, especially considering weaknesses in the supply chain revealed through the pandemic and recently emerging pressures on the food supply and input prices driven by the ongoing conflict in Ukraine. We need solutions that will keep our food supply healthy, safe, and secure, while protecting our natural resources. Since the need is constant, the food and agricultural industries, especially in Michigan, the U.S.'s most diverse agriculture state with a reliable source of water, provide great opportunities for economic prosperity, growth, and increased employment.

Solutions to crisis issues such as clean water and nutritious food mean not only providing and growing food and efficient use of water resources but understanding human behavior and the challenges people face across the country and worldwide. More than growing more nutritious food and providing clean water, we need to find ways to better distribute and understand the importance of both. We also need to better communicate the economics, so that more people understand the vitality of the food and agriculture industry.

The Michigan State University College of Agriculture and Natural Resources, AgBioResearch and MSU Extension work collaboratively with commodity organizations to address the issues facing growers and producers throughout the state – solutions on everything from disease management to food processing.

Agricultural resilience is at play here and every day.

We've recently created several centers of excellence around food production and natural resources conservation directly tied to addressing many global challenges of the future.

### **First, the Detroit Partnership for Food, Learning and Innovation (DPFLI).**

Founded in 2017, DPFLI is Michigan State University's first urban agriculture center. Housed within MSU Extension, DPFLI is dedicated to research and programming that improves the quality of life for Detroit residents and farmers. The facility also serves as a community space for recreation, respite, and connecting with nature.

The site is just under 3.5 acres on the former grounds of Thomas C. Houghten Elementary School. T.C. Houghten is the grandfather and great grandfather of Michigan State University alumni, and members of his family have made financial contributions and been involved in the site's development. Michigan State University selected the location in partnership with the City of Detroit and community members based on accessibility and presence of urban agriculture in the surrounding area.

### **Second, the Michigan State University Center for PFAS Research.**

Michigan State University's Dr. Cheryl Murphy is leading studies on PFAS contamination that has made headlines around the country and in Michigan, resulting in mounting concerns about the effects these chemicals have on public health. In response, Michigan State University has invested in a new Center for

PFAS Research and has developed several multi-institutional, nationwide partnerships to address the problem.

Researchers are working to quantify the exposure risk to humans and the environment, develop possible remediation strategies, and explore PFAS alternatives for industries that have relied on them. This is particularly relevant considering the increased prevalence and emerging concerns regarding PFAS contamination on agricultural land in Michigan and throughout the country and a lack of viable remediation strategies. For example, Dr. Hui Li, a professor in our Department of Plant, Soil and Microbial Sciences, received a \$750,000 USDA NIFA grant to study uptake of PFAS by agricultural crops, in addition to potential remediation strategies to prevent it.

Additionally, Dr. Murphy recently received a \$1.9 million grant from the Department of Defense's Strategic Environmental Research and Development Program. She leads an effort to develop a testing framework for PFAS toxicity, addressing how animals may be affected by these chemicals in lethal and sublethal ways.

### **Third the Michigan State University Center for Regenerative Agriculture.**

Michigan State University's animal science researcher Dr. Jason Rowntree is directing new studies investigating how future climate and weather variability will challenge the resilience of today's agriculture. Widespread adoption of regenerative agriculture across Michigan's 10 million acres of farmland will help mitigate these mounting challenges while improving soil health and reducing the carbon footprint of agricultural production.

Michigan State University's new Center for Regenerative Agriculture is aimed at improving the health and resilience of our land, plants, and animals. Center priorities include:

- integrating state-of-the-art field and remote sensing technologies to accurately measure ecological functions, including soil carbon sequestration, and
- examining the linkages between agricultural management, human health, and ecosystem functions and barriers to adoption of regenerative practices.

Ongoing research at our centers is critical to meet the future challenges facing agriculture, food, and natural resources. However, like many other research institutions, we are facing mounting challenges to deliver timely and relevant teaching and research due to aging infrastructure.

### **First our Plant Science Greenhouse Complex.**

Producing more food to meet the demands of an increasing worldwide population is no small feat. Much of that begins long before the field. Frequently it starts in greenhouses and growth chambers — the controlled environments where trial and error drives the future of food production by providing vital information on disease and pest control, temperature variability, soil balance and nutritional content among others.

Plant agriculture is essential to the Michigan economy. Field crops have an economic impact of more than \$5.12 billion in Michigan annually, in addition to \$1.2 billion from the nursery and landscape industries. Specialty crops play an important role as well, including the apple industry that ranks third in U.S. production and has an estimated annual economic impact of \$700-900 million.

More than 60 faculty and 400 students use the Michigan State University greenhouse facilities, but two-thirds of the greenhouses were built between 1955 and 1978 and lack modern, energy-efficient design.

To meet the growing needs of our plant agriculture industries, we must modernize and expand the greenhouse facility, including the addition of high containment, temperature-controlled spaces needed for research on plant breeding and emerging pests and pathogens.

### **Second, our Dairy Research and Teaching Facility.**

The dairy industry is a critical component of Michigan's agricultural economy, ranking #1 in farm receipts among the state's agricultural commodities. The industry supports more than 111,000 jobs in Michigan and accounts for nearly 5% of the state's GDP.

While Michigan State University continues to play a pivotal role in training students and conducting research on behalf of the industry, the Dairy Cattle Teaching and Research Center does not meet the growing needs. Our ability to deliver on Michigan State University's teaching, research, and outreach missions to the Michigan dairy industry, ranked 6th in the U.S. with 11.6 billion pounds of milk produced in 2020, is severely hampered by the age of the facilities.

A new facility will help maintain our leadership in dairy science throughout Michigan and beyond by allowing us to:

- identify feasible strategies to promote economic and environmental sustainability,
- ensure the highest level of animal care and production with robust data-driven science,
- enhance much-needed studies on nutrition, genetics, and animal well-being,
- create a pipeline of labor by introducing Michigan State University students to modern, relevant dairy operations, and
- train dairy professionals for the College of Veterinary Medicine curriculum accreditation.

I would also like to highlight some other important work happening at Michigan State University in addition to what has been shared above.

### **First, advancing pollination and pest control.**

Michigan State University entomologist Dr. Rufus Isaacs is leading a multi-state, multi-institutional project that impacts crops from apples to pickling cucumbers. As honeybee populations decline, Dr. Isaacs is looking at alternative pollinators to help maintain the vitality of U.S. crops that are pollinated every spring and valued at more than \$14 billion annually. Major funding comes from the USDA, Michigan State University Project GREEN and industry organizations.

Dr. Isaacs and several colleagues are also addressing ways to control the spotted wing drosophila (SWD), an invasive species that seriously threatens fruit crops such as apples and cherries, with a bio-control agent. Unlike most pests, the SWD mandible is so strong it can burrow its way into unripe fruit, leaving irreparable damage to the fruit and unavoidable economic loss to the grower. The Asian insect is believed to have come to the U.S. via food crates and has become one of our region's greatest fruit production threats.

### **Second, plant disease continues to be a steadfast priority.**

Corn tar spot, a fungal disease exacerbated by humid and wet conditions, had been limited to Central and South America prior to 2015. Since then, however, the pathogen has spread rapidly across the U.S., confirmed in 10 states and Ontario, Canada, with the potential to expand its reach in the coming years.

Michigan State University's Dr. Addie Thompson is studying potential genetic resistance to tar spot, which presents as small, black lesions on upper and lower leaf surfaces that work quickly to degrade plant tissue. According to previous studies, the disease can go from a few specks on one plant to encompassing an entire field in less than three weeks.

### **Addressing animal disease including those for dairy cows are ever important.**

Dr. Angel Abuelo, assistant professor in the Michigan State University College of Veterinary Medicine (CVM), is working to develop diagnostic tools that predict major illnesses during dairy cows' transition from late gestation to early lactation.

Roughly 75% of diseases in adult dairy cows occur in the first month after calving, with two of the most devastating being mastitis, a bacterial infection of the udder, and metritis, a bacterial infection of the uterus. These ailments can cause a deterioration in reproductive performance, lower milk production, lameness and in severe cases result in death. Mastitis alone costs U.S. dairy producers an estimated \$2 billion annually.

### **Research into precision agriculture remains a focus.**

Newly published Michigan State University research shows that incorporating in-season water deficit information into remote sensing-based crop models drastically improves corn yield predictions. This project is led by Dr. Bruno Basso, a Michigan State University Foundation Professor in the departments of Earth and Environmental Sciences, and Plant, Soil and Microbial Sciences, and the Kellogg Biological Station.

Yield predictions are of great importance, from national and international food supply chains to the individual grower. In addition to ensuring food security, highly consequential financial decisions are made based on this information. Growers must decide how much fertilizer and other inputs to apply to their fields, for example, an area in which costs have soared for numerous reasons, including climate change and global conflict.

### **We must maintain the momentum.**

Michigan's food and agriculture industry supports nearly 1 million jobs in the state. Successful partnerships between the federal government, industry, the Michigan Department of Agriculture and Rural Development, and Michigan State University can grow the sector.

We know that to meet the growing needs of Michigan's food and agriculture system, a system with a combined economic impact of more than \$104 billion, we will need to do more.

Working with state government and industry partners we recently created a 2-year food processing, technology, and safety certificate program. A full 47 percent of the agriculture jobs in Michigan involve food processing. Complementary to this effort, and with the support of the Michigan Department of Agriculture and Rural Development, we built a mobile food processing laboratory to be used at several

of our community college partner locations to deliver hands-on learning experience to students throughout the state. This work allows us to prepare students, both on campus and at partner community colleges, for jobs with any of the hundreds of food processors who call Michigan home.

While Michigan's agriculture production has expanded, facilities, workforce development and nimble research dollars have not kept pace. Targeted investments in workforce development, facilities, and research can enhance Michigan's agricultural success and retain talent.

Like other land grant universities, we look forward to continuing to generate and disseminate new knowledge and educate young people to work in the food and agriculture industry. As the world population is expected to reach 9 billion within the next few decades, our work is more important than ever.

I would be remiss if we did not commend Congress for including in the 2018 Farm Bill the Timber Innovation Act, that supports "research and development, education, and technical assistance for the purpose of facilitating the use of innovative wood products in wood building construction," specifically mass timber. Michigan State University, through the College of Agriculture and Natural Resources' MassTimber@MSU program, leverages research, education, outreach, engagement, and policy strategy to advance mass timber construction and manufacturing in Michigan and the surrounding region. An increasing number of Michigan building owners and project teams are looking to mass timber to achieve both sustainability and design objectives; this trend is present in regions across the United States. Those wishing to build with mass timber face two key challenges. First, the cost of mass timber materials is typically higher than other building materials. Second, demand for mass timber materials in North America is quickly outstripping the pace of their manufacture on the continent. The 2023 Farm Bill offers a powerful opportunity to renew the Timber Innovations Act to continue its original purpose and expand the act to address the above-referenced barriers by providing funding to support the establishment of new, domestic mass timber manufacturing and fabrication facilities, and for sunseting incentives to offset materials costs for early adopters of domestically produced mass timber materials in buildings.

While we, at Michigan State University, have been a recognized leader in agriculture and natural resources teaching, research and outreach for many decades, the system faces major challenges. The declining buying power of appropriations makes it difficult to maintain the long-term programs essential to addressing many agricultural and natural resource issues. The cost of research is rising, and funding limitations not only slow progress of scientists in traditional areas of agricultural research, but it also impedes our ability to bring a broader array of scientists to address agricultural problems. The current levels of funding in competitive grants programs have resulted in low funding rates, leaving meritorious projects undone and discouraging young scientists from entering the field. In short, it is creating a system that is not welcoming to the best and brightest young scientists. If this continues, it will erode our ability to respond to the challenge of feeding the world while protecting our environment.

We look forward to continuing our tradition as a strong land-grant university – educating future generations to meet the growing demands and discovering and sharing advancements that will benefit our state, the nation, and the world. Agriculture is America's oldest career, and today it is arguably one of the most complex, technology-driven, knowledge-based industries in the world. We've come a long way, but there continues to be so much more to do.

Thank you for this opportunity and your continued support. A few announcements follow that we are extremely pleased to have been awarded:

### **NIFA grant announcements (July 2020 to present)**

1. New USDA grant supports MSU researcher studying prevention of dairy cow diseases after calving
  - <https://www.canr.msu.edu/news/new-usda-grant-supports-msu-researcher-studying-prevention-of-dairy-cow-diseases-after-calving>
2. MSU researcher receives \$750K grant to examine effects of wildfire burn severity on soil health
  - <https://www.canr.msu.edu/news/msu-receives-750k-grant-to-examine-effects-of-wildfire-burn-severity-on-soil-health>
3. MSU researchers part of team investigating winter stresses of turfgrass in northern climates
  - <https://www.canr.msu.edu/news/msu-researchers-part-of-team-investigating-winter-stresses-of-turfgrass-in-northern-climates>
4. MSU research team receives \$750K USDA grant to explore ways to mitigate crop uptake of PFAS
  - <https://www.canr.msu.edu/news/msu-research-team-receives-750-000-usda-grant-to-explore-ways-to-mitigate-crop-uptake-of-pfas>
5. MSU researcher part of new \$10M project to study, support diverse perennial forage systems across the US
  - <https://www.canr.msu.edu/news/msu-researcher-part-of-new-10m-project-to-study-support-diverse-perennial-forage-systems-across-the-us>
6. MSU-led international research team receives \$1 million grant to build multi-disciplinary precision livestock farming network
  - <https://www.canr.msu.edu/news/msu-led-international-research-team-receives-1-million-grant-to-build-multi-disciplinary-precision-livestock-farming-network>
7. MSU to study precision livestock farming adoption trends in U.S. swine industry
  - <https://www.canr.msu.edu/news/msu-to-study-precision-livestock-farming-adoption-trends-in-u-s-swine-industry>
8. MSU research team receives USDA grant to evaluate effectiveness, cost of new blueberry pest management strategies
  - <https://www.canr.msu.edu/news/msu-research-team-receives-usda-grant-to-evaluate-new-blueberry-pest-management-strategies>
9. MSU receives \$2 million USDA grant to improve blueberry pollination
  - <https://www.canr.msu.edu/news/msu-receives-2-million-usda-grant-to-improve-blueberry-pollination>
10. MSU entomologist leads training for Latino/a farmers, receives new \$600K USDA grant
  - <https://www.canr.msu.edu/news/msu-entomologist-leads-training-for-latino-a-farmers-receives-new-600k-usda-grant>
11. MSU-led national cucurbit project reupped for \$7.1 million
  - <https://www.canr.msu.edu/news/msu-national-cucurbit-project-reupped-for-7-1-million>

### **Published research funded in part by NIFA (July 2020 to present)**

1. New MSU research shows how biofuel crops can help mitigate climate change when grown on land of otherwise little agricultural value
  - <https://www.canr.msu.edu/news/new-msu-research-shows-how-biofuel-crops-can-help-mitigate-climate-change-when-grown-on-land-of-otherwise-little-agricultural-value>
2. New MSU research showcases innovative method to develop more accurate corn yield predictions
  - <https://www.canr.msu.edu/news/new-msu-research-showcases-innovative-method-to-develop-more-accurate-corn-yield-predictions>
3. MSU greenhouses: Infrastructure that leads to innovation
  - <https://www.canr.msu.edu/news/msu-greenhouses-infrastructure-that-leads-to-innovation>
4. South Campus Animal Farms provides facilities to support MSU teaching, research, outreach missions
  - <https://www.canr.msu.edu/news/south-campus-animal-farms-provides-facilities-to-support-msu-teaching-research-outreach-missions>