

Spartan Dairy Newsletter

Fall 2024 Vol. 4 No. 3



Work continues on MSU Dairy
Students, faculty, and staff will benefit from improved facilities

Social contact in dairy calves
Page 9

Is it time to clean out your lagoon?
Page 10

Considerations for beef x dairy crossbreeding
Page 10

Alfalfa autotoxicity
Page 11

Table of Contents

This issue's cows are from De Grins Oer Dairy, Blanchard MI.

Want us to feature your cows?

Email ANS.SDN@msu.edu



4722 is pregnant with her 7th calf



8806 is a Fleckvieh x Holstein cross



8806 is related to KHW Regiment Apple-Red-ET

Dairy Spotlight.....pg. 3

- Catalina Picasso
- Eliza Hensel

News and Updates.....pg. 4

- 4-H Dairy Events
- Dr. H. Allen and Ann Tucker Lecture
- MSU well represented at ADSA Conference

Upcoming Events.....pg. 7

- Second annual Dairy Tailgate
- Sponsorship opportunity for Dairy Banquet
- Great Lakes Regional Dairy Conference

Management Tips.....pg. 9

- Social contact in dairy calves
- Lagoon and digester clean out
- Considerations for beef x dairy crossbreeding

Research Drill Down.....pg. 12

- Can we solve the mystery of alfalfa autotoxicity?

Michigan Dairy Recognition.....pg. 16

- Amy Martin
- Michigan Cream & Sugar
- Protein Pints

Sign up for the email newsletter here:



Sign up for the print newsletter here:



Dairy at MSU

@DairyMSU

Dairy at MSU

Enthusiasm continues for new dairy facility

A new dairy farm for a modern dairy industry

The new dairy facility will expand research capacity by increasing herd size to 680 in addition to creating modernized barns, feed centers, milking parlors and laboratories. The new facility, scheduled to begin operation in 2025, will provide spaces for student instruction. The \$75 million upgrades will enhance MSU's ability to support Michigan's thriving dairy industry and its farmers, which contributes over \$15 billion to the state's economy each year.

Randy Bontrager has been a herdsman at the MSU Dairy Farm since 1992. The impact the research at the farm has on his community of dairy farmers across the state of Michigan is another aspect of Bontrager's job that keeps him engaged each day.

"One of our main points of focus is emphasizing that there is a lot of money in grants and a lot of time invested by the faculty to do their research. They have done all this work and prep, and now it's dependent on us to follow through daily to maintain certain parameters and protocols and data recording, so everybody remains on the same page and this important work gets done correctly," Bontrager said.

The MSU Dairy Farm staff know with the excitement of the modern facility comes new challenges and training to pass on to new student employees, but Bontrager said he is glad the farm will provide students with a more applicable learning experience.

"I've never worked in that type of modern dairy environment, with all the automation and robotics, so it will be a lot of new, exciting things to pick up on and learn," Bontrager said. "Some of the things we teach now just can't be replicated on modern dairy farms, because we are so outdated in places, so the new facility will more represent what they will see in the future."

The visitor center at the new facility will feature an up-close view of cows in the parlor, and the dairy plans to offer public tours for observing its operations. Some parts of the old facility, such as the feed storage area, the anaerobic digester, and one of the cow barns, will continue to be used and open for view as well. Carolyn Dominguez, a herdsman at the Dairy Farm, said she looks forward to a facility more welcoming to the public to learn about dairy farming.

"I'm ready for people to have more awareness of how dairy fits in with a sustainable world," Dominguez said. "People need to be aware of where their food comes from and how dairy fits into the food system. I'm excited for people to learn about the conservation of dairy and the way manure usage and digestors can be used to make dairy more regenerative. I've always identified with the dairy farmers I've met in that they really care about the impact of what they are doing. I've always wanted to be a part of something bigger than just me and caring for our cows and training future dairy farmers allows me to do that here at MSU."

*By Justin Whitmore
MSU CANR Communications Manager
View the full article [here](#).*



Randy Bontrager goes over the daily check list with student employee Hunter Mather. Mather is a senior in the Department of Animal Science.

Dairy Spotlight

Catalina Picasso and Eliza Hensel



Catalina Picasso
Assistant Professor

Dr. Catalina Picasso is a veterinarian and epidemiologist specializing in zoonotic infectious diseases. After earning her DVM focusing on large animals, she pursued an MS and PhD in epidemiology from the University of Minnesota, working on infectious diseases that impact both animal and human health.

Throughout her career, her primary focus has been developing strategies to globally control bovine tuberculosis (TB). Working within the One Health framework, a collaborative, multidisciplinary approach that recognizes the interconnection between human, animal, and environmental health, she engages with producers, public health officials, policymakers, and researchers to promote integrated strategies for managing bovine TB.

With the recent emergence of Influenza A virus in dairies across Michigan, Dr. Picasso's focus has shifted to understanding this pathogen and addressing the current health emergency facing the industry. She is working to identify how the disease spreads and which practices are most effective in preventing infections in dairy farms and reducing the

persistence of the virus in affected herds.

Together with an exceptional team of researchers in the Large Animal Clinical Science Department and the Veterinary Diagnostic Laboratory at the College of Veterinary Medicine and in close collaboration with industry stakeholders, her team is dedicated to understanding HPAI in dairies. Their goal is to identify effective biosecurity measures, management practices, and diagnostic tests that will ensure dairy production remains sustainable and safe for farmers, workers, and consumers.



Eliza Hensel
Extension Educator

Starting work in a newly-created position can be a challenge. Without the benefit of past projects or existing collaborators, it can be difficult to create a program from the ground up. Luckily for those interested in farm, campus, and home composting, Eliza Hensel brings a wealth of knowledge not only in the biological processes of composting, but also in community engagement.

With undergraduate degrees in both environmental studies and Animal Science and previous experience in non-profit community composting initiatives, Hensel is both a subject matter expert and resource connector to other experts at Michigan State University.

Her current work focuses in on-farm composting, right to farm issues, and best practices for managing mortality composting. She is excited to begin working with more dairy farmers across Michigan and to promote the use of composting on farms. Hensel is open to visiting dairies across the state to understand the inner workings of their systems and act as a resource to composting in that setting.

If you have questions about on-farm compost production, mortality composting, or want to take a free online master composter class, email hensel1@msu.edu.

News and Updates

4-H Dairy Events

2024 brought some new obstacles for 4-H participants. The Michigan Department of Agriculture (MDARD) order prevented some 4-H'ers from showing lactating and pregnant dairy cattle. Virtual entries, interview judging, salesmanship, and scenario presentation were some of the creative alternatives offered this year.

Dairy Quiz Bowl

On June 29th, novice, junior, and senior teams competed in the Dairy Quiz Bowl. They demonstrated their knowledge of all aspects of dairy production by answering multiple choice and short answer questions. The junior (left image) and senior (right image) winning teams are below.



Dairy Expo and 4-H Dairy Days

From June 15th to 18th, middle and high school students came to the MSU Pavilion for Agriculture and Livestock Education. Events included the youth dairy judging contest, cattle showing, and a dairy management contest. Pictures of the winners with their names are listed below. Congratulations to the winners, and thank you to all youth, volunteers, and MSU Extension staff who made this event a success!



Willow E won overall champion showman.



Logan W won champion overall female in the junior female show.



Kaden P won reserve overall showman.



Junior division dairy management contest winners Evan W, Lydia A, Harlee B, and Grace W.



Several members of the top 20 in the senior 4-H dairy judging contest.



Senior division dairy management contest winners Megan W, Gracie T, Chloe S, and Ross K.

News and Updates



Dr. Rupert Bruckmaier delivers 2024 Tucker Lecture

In September, the Animal Science Department had the privilege of hosting Dr. Rupert Bruckmaier as the 2024 Dr. H. Allen and Ann Tucker Lecturer. Dr Bruckmaier recently retired from the University of Bern in Switzerland after a productive career as a veterinary physiologist. Dr Bruckmaier's research focused on milking physiology. His talk was called "Advancing dairy production: Should we select cows that fit our technology or develop milking technologies that align with lactation physiology?" Below are some highlights of his lecture.

Mammary physiology: The physiology of the cow's mammary gland is why farms must plan the milking routine to achieve a good milk let-down response and match this response timing with unit attachment. To milk the cows gently and efficiently, farms must provide proper stimulation during milking with the help of liners and pulsations. Dr. Bruckmaier shared some examples of using parlor technology to improve the alignment with lactation physiology.

Changes of vacuum at the teat end during milking: Teat end vacuums in low lines systems have small drops during and at the end of milking. New technology allows the measurement of the mouthpiece chamber (MPC) vacuum. The group measured the MPC vacuum and saw that it remained low while there was high pressure inside the teat. This is because there was a good seal between the liner and the teat, and because the liner lip allowed some degree of air entrance. When a quarter is done milking, the internal pressure of the teat decreases, the seal between the liner and the teat is lost, leading to an MPC vacuum increase. Therefore, MPC vacuum pressure is a marker for the cessation of milk flow by quarter.

Milking with increased pulsation ratio in rear quarters: The group milked the rear quarters faster by increasing the pulsation ratio to 80:20. The front quarters were milked normally with a pulsation ratio of 65:35. They did not observe any negative effects on the teats. There was no over milking overall, they saw shorter machine-on times and reduced time of milking while the front teats were empty.

The goal is to find the optimal interplay between the cow's milk ejection – the squeeze – and the milking machine – the suck. To improve the squeeze, the only option is optimizing the udder preparation. But we can adjust the suction side with modern technology to ensure optimal milking. It is the task of physiologists and researchers to work with the dairy technology groups in finding opportunities for improvement.

To learn more about Dr. Tucker or view the recorded lecture, go [here](#).



Dr. Rupert Bruckmaier met with several Animal Science graduate students after his lecture. Photo credit: Haylee Reisinger

*By Paola Bacigalupo Sanguesa
MSU Extension Dairy Educator*

News and Updates

MSU well represented at the ADSA meeting

Dr. Richard Pursley, professor of Animal Science, received the Zoetis Physiology Award, recognizing his research contributions in dairy cattle physiology.



Ursula Abou-Rjeileh, a PhD student with Dr. Andres Contreras, received the Alltech Inc. Graduate Student Paper Publication Award.



Dr. Angel Abuelo, associate professor in Large Animal Clinical Sciences, received the ADSA Foundation Scholarship Award in Dairy Production.



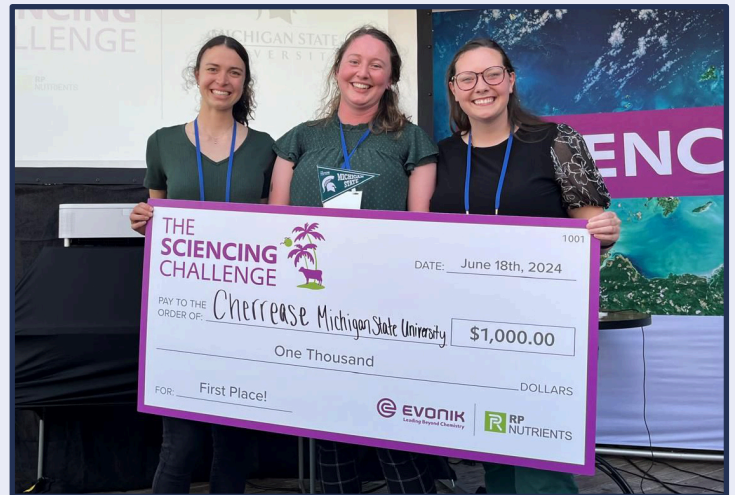
Dr. Kirby Krogsted received the ADSA Midwest Scholar Award. A recent graduate of Dr. Barry Bradford's Dairy Metabolism group, he is now an assistant professor of dairy nutrition at The Ohio State University.



Dr. Alycia Bales recently completed a PhD with Dr. Adam Lock. She also received the ADSA Midwest Scholar Award in recognition of her accomplishments as a graduate student. She now works at Caledonia Farmers Elevator.



Haylee Reisinger, Paiton McDonald, and Katy Kessler won the inaugural The Sciencing Challenge, held at the conference. They developed Cherrease, a pain management solution for dairy cows using cherry pits that were previously discarded as waste from Michigan's tart cherry production. Haylee and Paiton are PhD students with Dr. Barry Bradford. Katy is a PhD student with Dr. Andres Contreras



Upcoming events



MSU Dairy Industry Tailgate



November 2, 2024

4 Hours Before Game Starts - Until Kickoff
Southwest Corner of Mt. Hope and Farm Lane

After a busy harvest season, spend a day with Spartan fans and fellow dairy enthusiasts at the MSU Dairy Industry Tailgate!

Join us on campus for complimentary food and drinks in advance of the MSU vs. Indiana football game. We offer easy access to take the shuttle across the street to the stadium.

Bring the family, reconnect with old friends and meet some new ones!

For more information:

If you are unable to access the material online, please contact ANR Event Services at 517-353-3175 or events@anr.msu.edu.

MSU is an affirmative-action, equal-opportunity employer.



Sponsor the 2025 Dairy Industry Banquet

The Michigan Dairy Industry Banquet will take place on April 24th, 2025 in Williamston, Michigan. The celebration will recognize the accomplishments of MSU dairy students, including the Dairy Judging and Dairy Challenge teams, Michigan Dairy Memorial Scholarship recipients, and the MSU Dairy Club. The Department of Animal Science will also award the Michigan Dairy Farmer of the Year.

This celebration is an opportunity for students, parents, faculty, and dairy industry stakeholders to celebrate and recognize accomplishments within the Michigan dairy industry.

Please contact Dr. Joe Domecq at domecqjo@msu.edu or scan the QR code to learn more about sponsoring this event.



Dairy Education Programs
Michigan State University 

Michigan Dairy Industry Banquet Sponsorship Levels



**GOLD
HERD**

\$1000 and up

- 3 complimentary tickets to the banquet
- Full page advertisement in banquet book*
- MSU Dairy Education t-shirt and mug



**SILVER
HERD**

\$500 to \$999

- 2 complimentary tickets to the banquet
- Half page advertisement in banquet book*



**BRONZE
HERD**

\$499 and less

- 1 complimentary ticket to the banquet
- Logo or business card in banquet book

Upcoming events

GREAT LAKES REGIONAL DAIRY CONFERENCE



February 6-7, 2025

Soaring Eagle Casino & Resort | Mt. Pleasant, Michigan

Where farmers, experts and industry connect to help their dairies thrive!

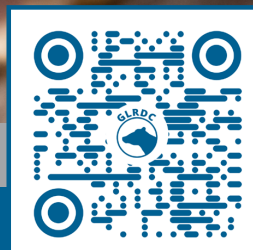
Topics include:

- Dairy outlook and deep dive into beef numbers with Sarina Sharp.
- Explore crisis management planning and animal welfare.
- Learn about making and feeding forage right, the value of vaccinations, and best practices to survive the dairy economic cycle.
- A deeper look at reproduction, calf health, fresh cows and more.
- Dive into biosecurity and animal health with Dr. Jason Lombard.
- Don't miss the FREE Spanish and English herdsman sessions Friday, focused on cows, calves, communication and much more!



Early Registration Ends Jan. 26!

www.glrdc.org | 989-666-3773 | honkemeg@msu.edu



Management tips

The short- and long-term effects of social contact in dairy calves

Cattle are inherently social animals, engaging in behaviors such as grooming, lying together and feeding. Research indicates that calves naturally form social groups with their peers and display positive behaviors from a young age. A significant portion of 0 to 60-day dairy calves in the U.S. are currently housed individually, driven mainly by concerns about disease transmission, behavioral issues, and management efficiency. However, growing evidence supports the welfare benefits of social housing, especially during the pre- and post-weaning periods.

Health is a paramount consideration in calf rearing, given its implications for both welfare and economic viability. Research underscores the importance of early life health status as a predictor of long-term productivity, with bovine respiratory disease (BRD) treatment correlating with reduced weight gain and herd retention rates. Comparisons between individual housing, pair housing and small groupings reveal minimal differences in health outcomes. Research has shown that larger group sizes are associated with increased health risks, including higher incidences of respiratory illness and diarrhea. It's essential to recognize that while social housing may contribute to health risks, numerous management factors also play pivotal roles, such as barn cleanliness, ventilation and cluster management. It comes down to finding the balance that works for your operation and setup.

Feeding behaviors are particularly influenced by social dynamics among herd animals. Interestingly, the level of social contact a calf experiences impacts the uptake of novel feeds, where pair-housed calves take to new feed more quickly. This increased acceptance of solid feed translates to decreased time off feed, promoting growth. This increased acceptance of novel feeds could potentially enhance the success and longevity of heifers once they enter the lactating herd.

Social rearing has a profound impact on the social development of dairy calves, heifers and cows. Short-term studies have demonstrated the broad benefits of social contact for calves, including reduced fear and increased sociability. Calves exhibit a preference for social bonding, spending more time near familiar companions and displaying motivation to access other calves, especially during feeding. Calves reared in pairs exhibit stronger social bonds and are better equipped to navigate social regrouping scenarios. Transitioning to pasture settings, observations of socially housed heifers reveal nuanced behavioral differences, such as increased activity levels.

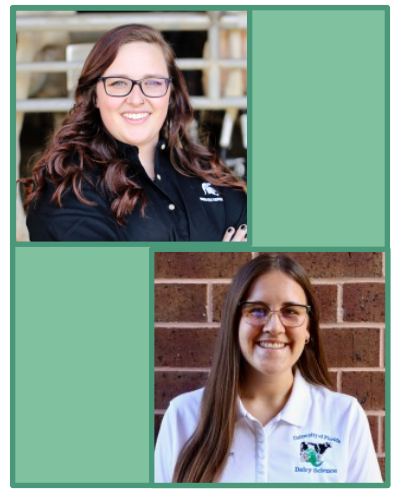
Calves provided with social contact exhibit reduced avoidance of novel objects during tests, indicating a greater comfort with unfamiliar stimuli. They also display greater behavioral flexibility in tasks like reversal learning, where they must adapt to changes in a familiar environment, such as the location of objects. Given the numerous challenges faced by dairy heifers prior to entering the lactating herd, their ability to adapt behaviorally to novel environments may serve as a significant predictor of overall welfare.

This article was written from a Heifer Academy webinar featuring Emily Lindner, a PhD student in the Animal Behavior and Welfare lab at the University of Florida. Heifer Academy is a six-speaker series on various topics of heifer management hosted by Extension Educator Cora Okkema in the spring of 2024.

Want more heifer content? Join Cora this fall for another six part series, beginning October 22nd at 11AM. Register here: events.anr.msu.edu/Hafall24. Past webinars are available at YouTube.com/@DairyMSU

View the full article [here](#).

By Cora Okkema
MSU Extension Dairy Educator



Cora Okkema (top) and Emily Lindner (bottom)

Management tips



Is it time to clean out your lagoon or digester?

What is sludge? It's the residue of biological manure treatment that accumulates in lagoons and digesters. It is lower in organic matter and higher in solids and minerals because of the longer treatment time in the manure storage structure. This also makes sludge denser than manure.

Why clean it out? Sludge storage in the facility reduces the treatment volume of the structure. When mixed with the liquid portion of manure, sludge can increase the nutrient content of recycled liquid pumped out of the facility. It can cause issues with barn air quality and pathogens as well.

Why measure sludge volume and nutrients? Test the depth in multiple locations across the facility as some areas will be deeper than others. Use a weighted plate or disc with a rope attached such as a Sludge Judge. Plan to apply the sludge to fields that show a need for the nutrients in sludge, particularly copper, zinc, and phosphorous.

How should I do it? In lagoons it is common to use PTO powered pumps and floating pumps or boats. Covered lagoons and digesters can be more difficult to pump out. Submerged pump-out lines with ports as well as sludge suspension and pumping are usually the best method in this situation.



Manure pit agitation taking place at a dairy farm using a manure slurry agitator. Photo credit: Sarah Fronczak

View the full article [here](#).

By Sarah Fronczak
MSU Extension Environmental Management Educator

Considerations for beef x dairy crossbreeding

A group of Extension educators conducted two surveys to better understand the decision-making process used by dairy farms when implementing a beef x dairy crossbreeding strategy into their herds. In both surveys, producers report that the three most important criteria used for selecting beef sires were:

- Semen Cost
- Conception Rate
- Calving ease

Some traits were less often considered, but are still relevant to a beef x dairy program. These include:

- Terminal traits, such as marbling, muscling, and ribeye
- Length of retention before marketing
- Growth rates, including weaning and yearling weights
- Time to market readiness and days on feed

The dairy producer should select beef bulls that excel in terminal traits for greater improvements in beef production efficiency from bull calves. Considering only the 3C's (conception rate, calving ease and semen cost) does not guarantee improvement in beef yield for beef x dairy cattle compared with straight bred dairy cattle raised and fed for beef. Beef x dairy cattle that perform like native beef cattle will receive a greater price at sale relative to beef x dairy cattle that perform like dairy cattle.

Are you considering beef x dairy for your operation?
Do you want to learn more? Contact Jerad at jaborekj@msu.edu

View the full article [here](#).

By Jerad Jaborek
MSU Extension Beef Educator



Research drill down

Can we solve the mystery of alfalfa autotoxicity? Dr. Kim Cassida shares her perspective

Alfalfa is an important forage crop for dairy cattle, but it has an unusual trait that can challenge hayfield management. It suppresses germination and growth of its own seedlings. This is known as autotoxicity, and is a form of allelopathy, which refers to a more general phenomenon in plants that suppress growth of other plant species.

Alfalfa does *not* interfere with establishment of other species like forage grasses, clover, or rotation crops.

About alfalfa

Alfalfa is the nation's third most valuable field crop at roughly \$8.7 billion per year. While alfalfa has many uses, it's most often grown for animal agriculture forage due to its nutrient-rich profile. It is especially valuable as a perennial forage crop for its high crude protein and energy content and ability to fix nitrogen. Like any other crop, alfalfa faces insect and diseases challenges, but current varieties are exceptionally hardy and able to withstand a variety of environmental pressures.



Pre-bud alfalfa. Photo credit: Phil Kaatz

Autotoxicity and Autosuppression

There are two significant management consequences to autotoxicity. The first one is obvious—direct failure of germination and seedling establishment when planting new alfalfa into soil that previously grew alfalfa. This is the reason that producers cannot effectively thicken

aging alfalfa stands by overseeding with more alfalfa seed. The second consequence of autotoxicity, autosuppression, is both more common and harder to recognize. With autosuppression, new seedlings emerge and grow. Unbeknownst to aboveground observers, their taproots are permanently damaged even when the new seedlings look superficially normal. Once the seedling taproot is damaged, it may compensate to some degree by increasing side branching, but the overall effect is reduced persistence and lifetime yield for that plant. It will never be the plant it could have been.

Autosuppression is the reason for lengthy rotation interval recommendations before reseeding alfalfa into a field where it was previously grown.

Why does this happen?

The specific cause of alfalfa autotoxicity has never been identified. Growth-inhibiting chemical compounds released from alfalfa tissues into soil have been the leading suspects, including a large range of phenolics and saponins, but no single compound or combination of compounds have been proven. Three conditions are required to prove chemical allelopathy:

1. A plant must produce compounds capable of suppressing germination and growth
2. Those compounds must be present at high concentrations in soil,
3. There must be no other plausible environmental or biological factors that could explain the problem.

It is challenging to set up field experiments that can control all possible environmental, genetic, and management factors that might contribute to autotoxicity. Therefore, much of our existing knowledge has been obtained from laboratory bioassays using extracts of plant material. While useful, this does not always play out as expected in a field situation. There is some laboratory evidence that alfalfa varieties differ in genetic potential to produce or tolerate autotoxins.

Research drill down

“We’ve known about this issue for a long time, but there haven’t been any concrete solutions generated. Alfalfa is a tremendously valuable crop for Michigan, the U.S. and beyond, so finding answers to the problem of autotoxicity is extremely important. In my role as an MSU Extension specialist, I work directly with farmers, and I want to be able to give them more prescriptive recommendations.”

How does it work?

Autotoxins are more concentrated in leaves than in stems or root tissue. Toxins are water-soluble and leach out of soil in proportion to rainfall or irrigation. Autotoxicity dissipates faster in light-textured than heavier soils, but the initial toxic effect right after termination is often greater in the light-textured soils. Tillage speeds the rate of dissipation. A classic experiment in Missouri showed that mature alfalfa plants have reduced seedling survival extending in an 8-inch diameter around the crown, with autosuppression extending out to 16 inches. Stands with only 0.8 plants/ft² can exhibit autotoxicity.



Graduate student Paige Baisley counts alfalfa seedlings established after 2-week or 20-week rotation intervals before replanting. Bands of reduced seedling growth are the 2-week rotation. Photo credit: Kim Cassida

This means that an alfalfa stand that is well below the economic replacement threshold of 5 plants/ft² may still have too much autotoxicity to allow reliable reseeding of a new stand. Current MSU Extension recommendation is to include tillage in alfalfa termination practices and then wait at least six months to one year before attempting to replant alfalfa, possibly longer if soil is heavy.

We are unable to be more specific because we simply have no way to know exactly when the autotoxicity is gone. More precise predictions regarding autotoxic potential of the soil would assist alfalfa producers to make appropriate planting decisions. If no-till is used or drought conditions exist, wait up to two years between alfalfa rotations. A year or two of corn silage between alfalfa rotations is a good strategy.

Bioassay challenges

My research group began working on autotoxicity in 2018 using funds from the alfalfa checkoff program and Project GREEN. Our initial efforts focused on developing a fast three-day bioassay that might be used in the MSU Plant Diagnostic Lab to flag soils where alfalfa establishment was likely to fail. We hoped this could provide a decision tool for producers.

Unfortunately, while we were able to detect differences among soils with this short bioassay, validation tests showed it is not reliable at detecting potential for long-term autosuppression. We have not given up the idea of a diagnostic test but it will not be a fast turnover test and may take several weeks to provide an answer.

A new hypothesis

Meanwhile, PhD student Paige Baisley was doing field plot research to look at the effect of replanting alfalfa into stands where existing alfalfa was terminated 2 versus 20 weeks earlier. An interesting observation emerged.

Soils expected to be greater in autotoxicity from alfalfa stands fertilized according to MSU Extension recommendations were unexpectedly often also deficient in soil nutrients essential to seedling establishment, specifically potassium and phosphorus. This led us to a new hypothesis that nutrient deficiency may play a role in

Research drilldown

autotoxicity. Plants of all species actively exude a rich mixture of chemicals into the rhizosphere, which is the soil layer immediately around the roots. These chemicals, many of which are phenols, help plants obtain soil nutrients and therefore plants may produce more of them when nutrient stressed. This could explain why some failing alfalfa stands are more autotoxic than others.

“When I talk to growers, one of the most common questions I get is, ‘Has it been long enough to replant alfalfa?’ We tell growers to wait at least six months to two years depending on all the contributing factors, but that uncertainty is frustrating.”

Research Objectives

1. Identify the compounds responsible for autotoxicity.
2. Determine how root function and soil microbiology interact with factors such as soil fertility to influence chemical development and release.
3. Begin the process of breeding alfalfa varieties that do not cause this problem.
4. Communicate with growers via MSU Extension education.

The end goal of the research is to pave the way for developing new varieties that either produce less toxins or are able to tolerate them more effectively. This research may also serve as a framework for other crops that exhibit autotoxicity.

Continuing research

In 2023, my lab received a \$980k grant from the USDA-NIFA Alfalfa Seed and Forage Systems program to continue our work towards identifying causative compounds in autotoxicity while adding new efforts to study how root exudates, the alfalfa root microbiome, nutrient deficiency, and alfalfa genetics may be related to the problem. This project also includes Dr. Sarah Lebeis from the MSU Plant Resilience Institute and Dr. Virginia Moore, an alfalfa breeder at Cornell University. Currently, we are working on

categorizing possible autotoxins in root exudates, planning how to best evaluate possible interactions with potassium fertility, and analyzing microbial populations from alfalfa root microbiome. Our Cornell colleagues have begun the process of screening populations for tolerance to autotoxicity. It is early in the project, but we are very excited about the results to date and look forward to having more to share with the dairy industry in the future.

Want to learn more?

Dr. Cassida spoke on this topic at an MSU Extension Virtual Breakfast in 2023. You can view her talk, and learn more about the virtual breakfast series [here](#).

She also runs the [MSU Forage Connection website](#), which contains information on current research projects, events, and variety trial results related to forage crops in Michigan.

About the Researchers



Dr. Kim Cassida is an Associate Professor and Extension Specialist in the Plant, Soil, and Microbial Sciences Department. Her research and extension programming focus on alfalfa and grass management for hay and haylage. Contact her at cassida@msu.edu



Paige Baisley is a PhD student with Dr. Cassida studying alfalfa autotoxicity. She has a bachelor's degree in environmental science from Dickinson College, and has previously worked in soil and pasture management research.



Dr. Virginia Chambers is an Assistant Professor of Plant Breeding and Genetics at Cornell University. Her plant breeding research focuses on sustainable cropping systems, including organic production, perennial forages, and polyculture systems.

By Kim Cassida

Associate professor and Extension Specialist

Includes content from an article by Cameron Rudolph, Senior communication manager, MSU AgBioResearch

Michigan dairy recognition

Shining a light on industry leaders



Amy Martin is the new District 3 Director for the Michigan Milk Producers Association (MMPA).

Amy, her husband Craig, and sons Eric and Brandon operate Gingrich Meadows in LeRoy, Michigan, which began in the 1940s. They manage 1,600 acres of farmland and 500 milk cows.

Besides her work on the farm, Amy has served the MMPA in several capacities. She has previously served on the MMPA Advisory Committee, Restructuring Task Force, and as a local secretary. In her role as a district director, she will help guide the direction of the MMPA cooperative and set strategic goals. Thank you for your service to the dairy industry!

By Mikayla Bowen, mimilk.com

Michigan Cream & Sugar receives the Best Small Business award

Michigan Cream & Sugar won the Best Small Business- Great Lakes Bay Region from the Michigan Small Business Development Center in May. The organization selects winners who demonstrate success in small business growth and community impact. General Manager Tim Managan (right) accepted the award at the 20th annual Michigan Celebrates Small Businesses Awards Gala.

The Bay City based ice cream company was also awarded a Dairy Business Builder Grant from the Dairy Business Innovation Alliance this year. The grant funds will help to expand the ice cream production capacity at a new facility.

Photo Credit: Michigan Cream and Sugar

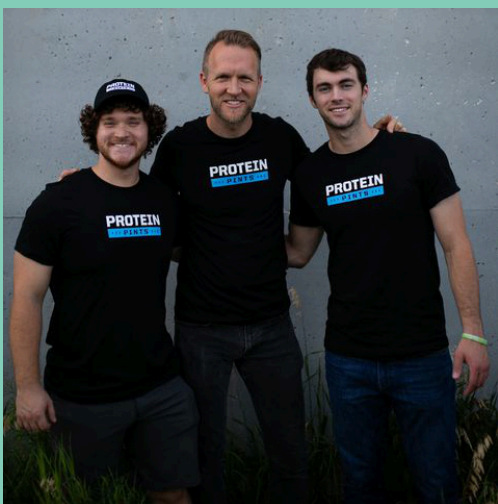


Paul Reiss and Michael Meadows named 2024 Young Innovators of the Year

At this year's Making It In Michigan Conference, Protein Pints received the Young Innovator of the Year award. Hosted by the MSU Product Center, the conference showcased hundreds of Michigan-based food businesses. Protein Pints was started in 2022 by two friends who wanted a delicious way to get more protein in their diet. Available in four flavors, each pint contains 30 grams of protein, is low-sugar, and low-calorie. Protein Pints is available at the MSU Dairy Store and ten Meijer Supercenters.

Mike (left) and Paul (right) are pictured with business partner Christopher McKellar (center).

Photo credit: Protein Pints



2265K Anthony Hall
474 S. Shaw Lane
East Lansing MI 48824

MICHIGAN STATE
UNIVERSITY

Extension

Mark your calendar

- **Heifer Management Series, Online**

Tuesdays at 11 beginning October 22nd

- **Dairy Tailgate, East Lansing**

November 2nd, 4 hours before game

- **Tri-State Field Day, Montpelier OH**

November 14th, 9AM - 3:15PM

- **Dairy Education Academy, East Lansing**

November 15th and 16th

- **Farm Succession Planning, Sidney MI**

Wednesdays at 2 beginning January 8th

- **Michigan Manure Management Summit**

January 22nd, 9AM - 4PM



Want to connect with your local dairy extension educator? Find them here:



View a complete events listing at canr.msu.edu/dairy/events