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MICHIGAN WHEAT PROGRAM

ANNUAL REPORT
2014-2015

Strategy for Winning with Wheat



Just a word ...

About the 2014-15 Annual Report. In describing the Michigan Wheat Program's work since being established by a vote of wheat farmers in 2011, we returned to home base – our strategic plan.

Our board-driven strategic plan got underway in 2012 with input from farmers, the seed and milling industries, food manufacturers (end users), Michigan Farm Bureau, the Michigan Department of Agriculture and Rural Development, Michigan State University, MSU Extension, researchers and other ag leaders who all gathered around a table to talk wheat.

This group had the exciting task of creating a direction for an entire ag industry via a brand-new wheat check-off!

That strategic plan has established a direction for research, marketing, education and communications that the board continues to follow today.

Our report back to growers – in this *Strategy for Winning with Wheat, the 2014-15 Annual Report of the Michigan Wheat Program* – lets you see the many accomplishments the check-off has already achieved. And the winning strategies we're pursuing for the future.



MICHIGAN WHEAT PROGRAM

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MICHIGAN WHEAT PROGRAM MISSION STATEMENT

To promote a viable, thriving and growing Michigan wheat industry that includes input suppliers, seed producers, growers, millers, end users and consumers.



Dear Fellow Michigan Wheat Farmer:

We are rapidly approaching the 5-year anniversary of our voting to create the Michigan Wheat Program. Our adoption of a Michigan check-off for wheat was a 10-year dream that was finally realized in 2011.

The dream was much bigger than creating an organization, it was about results! As this Annual Report was written, our board has four years into our strategic plan.

In the first four years, we're already realizing results. This report reflects our work mainly over the 2014-15 fiscal year, which was built on previous years' work. We have:

- Continued to implement the strategic plan;
- Established a strong research program focused on growers' needs;
- Collected assessments;
- Facilitated a change in falling number crop insurance coverage;
- Funded 50 research projects;
- Invested over \$1.1 million in research;
- Partnered with MSU on a new wheat specialist position;
- Created and revised the miwheat.org website;
- Held six major wheat farmer events highlighting our research and production;
- Supported a wheat educator at MSU;
- Supported a wheat breeder at MSU; and
- Established a Facebook page and a modest consumer outreach program.

Moving ahead, the board is proud to present you with this report, our *Strategy for Winning with Wheat, the 2014-15 Annual Report of the Michigan Wheat Program*. It's a brief summary of all that we've been about in FY 2014-15.

We're proud to tell you about it and hope you enjoy reading to learn more about your check-off dollars at work!

A handwritten signature in black ink that reads "David J. Milligan". The signature is fluid and cursive.

David J. Milligan, Chairman
Michigan Wheat Program

The Michigan Wheat Program Board

in their own words: Top accomplishments, 2011-2015

The original nine-member board of the Michigan Wheat Program was appointed by Gov. Rick Snyder in November 2011. Board terms are three years in length, and have staggered expiration dates.

Through the 2014-15 fiscal year, eight of the original board members opted to remain on the board and seek reappointment for another term. Many of them had been on the temporary committee that helped create the Michigan Wheat Program. One seat has turned over, with the appointment of Sally McConnachie this year.

The board members had some definite thoughts about the most important accomplishments of the Michigan Wheat Program to this point:



Seated, from left: Chris Schmidt, David Milligan, Art Loeffler, Frank Vyskocil. Back row, from left: Sally McConnachie, Carl Sparks, Dean Kantola, William Hunt, Gerald Heck, and Jody Pollok-Newsom.

David J. Milligan, Chairman
Milligan Farms, LLC
Cass City (District 7)
Years on board: 4

“Our two biggest accomplishments to date, in my view, have been first, getting adequate coverage for falling number crop insurance claims from USDA’s Risk Management Agency. And second, getting a wheat specialist position created and staffed at Michigan State University.”

Art Loeffler, Vice Chairman
Star of the West Milling Company
Frankenmuth (District 9)
Years on board: 4

“The fact that we now have an organization that represents the wheat growers and works closely with the industry gives us more clout with government, MSU and commodity groups. And second, the ability to make changes with crop insurance. We worked on that for years before the wheat referendum and couldn’t get anywhere.”

Chris T. Schmidt, Secretary
Schmidt Farms of Auburn
Auburn (District 8)
Years on board: 4

“Our greatest accomplishment to date is revitalization of wheat as a successful cash crop for Michigan farmers. The Michigan Wheat Program has facilitated this by bringing growers, industry and researchers together. Our research dollars, made possible only through the check-off, have already addressed a number of growers’ questions/concerns and will continue to do so.”

Frank M. Vyskocil, Treasurer
Shiawassee Valley Farms
New Lothrop (District 6)
Years on board: 4

"The check-off's biggest value to the wheat industry has been to recognize the concerns with growing wheat in the state of Michigan including crop insurance inequity for falling numbers, DON issues and timing of nitrogen applications, as well as bringing in key influencers for training and speaking events. Also hiring Dennis Pennington as the MSU wheat specialist."

Gerald W. Heck
Heck Farms, LLC
Monroe (District 3)
Years on board: 4

"Our most important work includes research and education on high-management wheat plots, and the information we have exposed producers to at our field days and annual meetings. Also, our advocacy for wheat at various events and bringing Eric Olson to MSU as the wheat breeder."

William H. Hunt
Hunt Farms, Inc.
Davison (District 4)
Years on board: 4

"The biggest accomplishments are, first, the way the wheat board is utilizing funds for important research projects. Second, we have made great progress on pulling wheat producers together at the annual meetings, field days and other wheat functions."

Dean A. Kantola
Kantola Farms, Inc.
Ravenna (District 1)
Years on board: 4

"I keep coming back to the part we played (both in the process and financially) in working with MSU to hire the wheat breeder Dr. Eric Olson. Also, all the work that went into getting RMA to make changes for the falling numbers in crop insurance was a very big accomplishment, as well as the recent hiring of wheat specialist Dennis Pennington, who is going to be a big benefit to growers."

Sally McConnachie
Dave's Dirt, LLC
Deckerville (District 4)
Years on board: 1

"I would say that our most important accomplishment so far is our part in obtaining better crop insurance coverage for falling number discounts. Also the knowledgeable informational speakers we provide at our annual meetings and field days, along with our ongoing support for research projects and high management MSU wheat variety trials offers some great educational opportunities for growers."

Carl Sparks
Sparks Cedarlee Farm, LLC
Cassopolis (District 2)
Years on board: 4

"Perhaps our biggest accomplishment is that we have positively 'moved the needle' in all of our goals. Also, MWP is becoming the central voice for the Michigan wheat industry. The growers, millers, and processors now have an efficient, safe vehicle with which to communicate to each other. We all have a common goal of a prosperous Michigan wheat industry."

Education & Communications: **Do you know what we know?**

As the “new kid on the block” in 2012, the Michigan Wheat Program needed to introduce itself to a large circle of farmers and other players in agriculture, news reporters and social media, consumers and dietitians. On a shoestring.

Not only did the wheat check-off need to set up systems to make people aware of the program, but the Michigan Wheat Program also needed to demonstrate that it had valuable information. The program’s robust research agenda and many partnerships can only help Michigan wheat farmers if they know the activities exist and receive the information in a timely manner.

For this reason, the board and stakeholders devoted significant focus to strategic goals for education and communication.

Following are the **4** education and communications goals of the Michigan Wheat Program.

Goal 1: Build the Michigan Wheat brand independently and by working with more established ag and food partners.

- Partner with other Michigan check-offs and associations to benefit from their established capabilities and leverage resources.
- Participate in Pure Michigan agriculture campaign and Breakfast on the Farm-type events focused more on consumers to share the positive messages about wheat.
- Establish dialogue with ag media and, to a lesser extent, consumer news media so that the program has ready portals for wheat news to farmers, consumers and others.

Goal 2: Become a one-stop resource for credible wheat information including research results, crop alerts, insurance updates and other news of note for Michigan wheat farmers.

- Develop website with valuable, timely information for wheat farmers.
- Aggregate research results and production articles from check-off-funded activities and make available to growers in multiple ways.
- Establish robust grower education events.
- Reach farmers at least five times a year through meetings, field days, newsletters and electronic media.

Goal 3: Build visibility by participating in all types of agricultural meetings.

- Participate in meetings of other organizations with similar goals.
- Present at local, regional and statewide meetings of farmers.
- Develop a booth with supporting materials to display at agricultural meetings.
- Join and participate in national wheat and wheat product organizations.
- Become involved with agricultural youth through supporting their activities.

Goal 4: Develop a solid foundation that enables timely and professional communications to farmers, media, legislators and the public.

- Establish annual strategic communication plan.
- Build email list of wheat farmers, media and stakeholders to allow timely, affordable communication.
- Create exhibit materials and publications of interest to the general public.
- Monitor and establish positive wheat messaging to consumers, including participation at select events.
- Establish digital and social media presence.

CONSUMER EVENTS

The Michigan Wheat Program's first consumer activity took place in a familiar setting: Breakfast on the Farm. These events are statewide financially supported by many commodity organizations such as wheat, Michigan Farm Bureau, local volunteers, and agribusiness. They are organized by Michigan State University Extension and take place all across the state and have proved an excellent venue for educating thousands of local residents about farming with a free, fun, family outing while also providing a Michigan breakfast.

During the summer of 2014, Executive Director Jody Pollok-Newsom and new board member Sally McConnachie, of Deckerville, represented Michigan wheat at their first **"Breakfast on the Farm"** at the Lyn Uphaus family farm in Washtenaw County. This was the first time MWP had come face-to-face with consumers. There was a real interest from consumers in Michigan agriculture and wheat.

Virtually all visitors who stopped by the booth were supportive of farmers, were open to learning about Michigan-grown wheat and said they consumed wheat products on a regular basis.

Prior to the event, Michigan Wheat worked with MSU Extension as they developed a thorough informational piece **"Facts About Gluten,"** (HNI206, June 2014). There were a small number of visitors with questions about a special diet who were either gluten-free, knew someone who was or were just curious.

As the Michigan Wheat Program has further developed its strategic plan on communication and education, it became evident that a very important gatekeeper in the wheat industry is the consumer. Breakfast on the Farm moved the MWP into direct dialogue with consumers, and when the Michigan Wheat Program was asked to participate in a **"Taste of Home"** event in Saginaw they were there. Again McConnachie and Pollok-Newsom attended to share their wheat wisdom with attendees. This audience was again very supportive of agriculture and wheat and were appreciative of not only the educational information, but the wheat goodies attendees could take home.

Also this year the Michigan Wheat Program ventured into the culinary world by participating in the **Michigan Restaurant show**. The Michigan Wheat Program joined other commodity organizations in a Michigan area at the show highlighting Michigan commodities and food. Jody Pollok-Newsom was joined by board member Sally McConnachie and Karina Spencer from Star of the West to discuss wheat and share information about the golden grain. One of the draws to the booth were delicious Belgian chocolate, sea salt cookies made with Michigan wheat donated by Crust Bakery. The cookies were a great draw for the booth and once at the booth, participants were given wheat information including the importance of wheat in the diet, the importance of gluten in the diet and Wheat 101. The Michigan Wheat Program worked with a young, up and coming chef as he developed a brand new recipe that he demonstrated on the stage at the show. It was a great event as you don't often get to talk with chefs and culinary students who are so important to keep wheat featured and on menus in the future.

These types of events will continue to be a priority in the future for the consumer work. Establishing consumer connections locally builds trust and will help the wheat industry better target future messages about the importance of wheat economically, environmentally and nutritionally.



HUNDREDS ATTEND GROWER MEETINGS; INFO AVAILABLE FOR THOSE WHO DID NOT

Several hundred wheat farmers attended the Michigan Wheat Program's Winter Annual Meeting and Summer Field Day in 2014-15. They were rewarded with a full day of educational programming including research results and national perspectives on wheat production.

- **Summer Field Day 2015.** The June program in East Lansing focused on in-plot talks by MSU researchers about wheat issues including diseases, nutrient management, weeds, wheat breeding and high management production techniques. More than 200 farmers attended the event and learned more about wheat production and ways in which to increase their yield.

Summer Field Day 2015 was captured by the Michigan Wheat Program in a multi-media learning "hot spot" on its website. Wheat farmers who were unable to attend the event can visit www.miwheat.org/education/previous-events and still see short videos of the researchers' presentations. Their handouts are also attached to the day's itinerary on the web page.



- **2015 Winter Annual Meeting.** In March, the Michigan Wheat Program hosted another day-long program on wheat, which was keyed by Peter Johnson, the provincial cereal specialist (now retired) from the Ontario Ministry of Agriculture, Food and Rural Affairs.

National perspectives were offered by Jim Palmer, the CEO of the National Association of Wheat Growers; US Senate Agriculture, Nutrition & Forestry Committee staff member Joe Shultz; and RMA crop insurance specialist Alex Offerdahl of Watts & Associates.



MSU researchers provided the 300+ growers in attendance with updates on weeds, wheat nutrition, the use of ag drones and other topics. An end-user panel featured marketing experts Derrick Shook from Mondelez, Deirdre Ortiz from Kellogg's and the Michigan Millers Association President, Jim Doyle. They shared with growers the uses and importance of the state's wheat crop. The multi-media collection of PowerPoint slide decks, handouts and videos from the 2015 Winter Annual Meeting are available at miwheat.org/education/previous-events.

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WHEAT WISDOM LAUNCHED TO ALL WHEAT FARMERS

An important communication channel for farmers was established by the Michigan Wheat Program during the 2014-15 fiscal year: *Wheat Wisdom*.

This aptly-named e-newsletter is published monthly and includes a variety of news specific to Michigan wheat farmers including new research projects, wheat research results, new partnerships, consumer outreach events and other activities of the wheat check-off.

Already, the subscription list has grown to nearly 2,000 growers and industry stakeholders. To get the free e-newsletter, visit miwheat.org, scroll to the very bottom and enter your first name, last name and e-mail address.

Interestingly, *Wheat Wisdom* has an "open" rate of 35-40 percent on average, meaning that more than one-third of the people who subscribe to it read it regularly. And usually within a few hours of when it hits their email box. The standard "open" rate in the ag/food service sector is about 21 percent. Thank you for reading the news on wheat!

View this email in your browser



WHEAT WISDOM

November 30, 2015

In This Edition

- Evaluating wheat stands in fall
- Michigan Wheat Program and MCI/A sow seeds through partnership on new research planter
- Michigan Wheat Program secures grant to establish metrics on state's wheat production and set future goals
- Series of regional Pest & Crop Management Update meetings scheduled for early 2016
- 2015 Integrated Crop and Pest Management Update set for December 15
- Registration now open for 2016 Great Lakes Crop Summit
- Applications due January 1st for Great Lakes Leadership Academy
- Upcoming winter meetings

Evaluating wheat stands in fall
By Martin Nagelkirk, MSU wheat educator

Editor's Note: Following is an excerpt on evaluating wheat stands in fall. Click here for the full article with photos.

Much of a wheat crop's yield potential is determined by the time wheat emerges in the fall. Walk your fields on a snow-free day to assess seeding rates, drill performance and seedling vigor.

Start by counting the seedlings per row foot. Early planted wheat should have 15-20 plants per row foot (7.5" row spacing), while 22 is desirable for seed sown after mid-October. Comparing the number of seedlings with the rate of seeding is another point for evaluation.



RE-LAUNCHED, RETOOLED WHEAT WEBSITE

The miwheat.org website was substantially upgraded this year, by re-organizing and expanding the content.

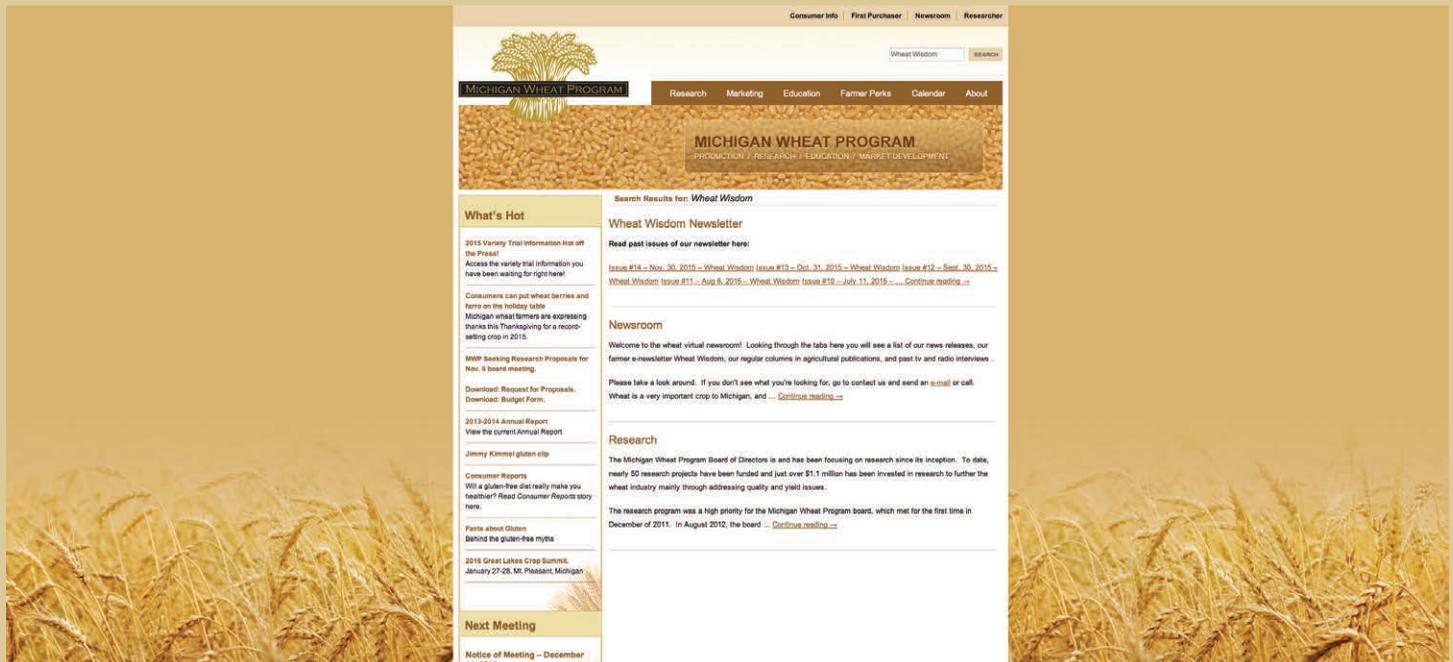
The central navigation bar on the site is now focused on the interests of farmers, and is nicknamed the “farmers’ bar.” It includes tabs for Research, Marketing, Education, Farmer Perks, Calendar and About, hitting farmers’ main interests.

The site has dedicated tabs for First Purchasers including assessment forms, and a well-developed Newsroom for the media and also farmers, as past editions of the e-newsletter reside there.

A new Consumer page has activity sheets for kids that were developed in conjunction with the Michigan Festivals & Events Association for the McDonald’s® restaurant promotions, and fact sheets for their parents. It is also linked to fact-filled positive articles about gluten from Consumer Reports and MSU, recipes and even a video from the Jimmy Kimmel show poking fun at the anti-ag and gluten-free crowds.

Multi-media capabilities of the new site—as mentioned in the grower meetings article on the preceding page—are improved. Equally important, the web platform is now fully searchable by Google key words, meaning farmers are more likely to quickly find the information they need. The site also has new social media interface with Facebook and YouTube.

As Michigan Wheat Program-sponsored research projects are completed, results are being added to the Research tab. With the 2015 addition of MSU wheat specialist Dennis Pennington, the check-off expects the number of informational wheat research articles posted on the website to continually expand.



WHEAT ON DIGITAL MEDIA: LOW-COST WAYS TO REACH NEW AUDIENCES, PROVIDE MORE INFORMATION

Building the profile for the Michigan wheat industry demands a digital presence! In the last year, the Michigan Wheat Program has developed a presence on Facebook (Michigan Wheat) and YouTube (Michigan Wheat Program).

Since early 2015 when the Michigan Wheat Program established its YouTube channel, 18 wheat learning videos have been posted and the channel has a handful of subscribers. Some videos already have more than 100 views.

The Michigan Wheat Program Facebook page was set up during this fiscal year, before the Michigan Wheat Program began its consumer outreach efforts including Breakfast on the Farm and the Michigan Restaurant Show. The popular Facebook format brings wheat growers and the general public together to share fun information about wheat. This site has grown to 550 “likes” with promotion only at events and activities.

The most popular content is recipes that help build an audience with which to share occasional nutrition and farming tidbits and also information on upcoming consumer events. Sign on and “like” Michigan Wheat today!

Marketing: Leveraging Michigan's unique marketplace strengths to meet future opportunities.



Michigan wheat has significant market opportunities. The state's wheat farmers will be able to capitalize on them by growing more wheat, particularly by utilizing high-management techniques, new varieties and adopting wheat as part of their crop rotation.

A key reason that Michigan wheat is well-positioned in the marketplace is because our soft winter wheat (red and white) has a distinctive profile and is preferred in recipes used by many manufacturers of cereal, cakes, cookies and crackers. Wheat grown elsewhere in the US does not have these same preferred qualities.

Michigan is also within a day's drive of a majority of the US population, including food processors. This keeps transportation costs

low. Processors want consistency in their brand-name products, and are not inclined to switch suppliers, especially when they can count on a high-quality product. Michigan millers meet the market demands of many processors in and around the Great Lakes. There is strong loyalty from those processors for Michigan-grown wheat.

Given the strong processing infrastructure already in place, the MWP board and stakeholders paid special attention to marketing goals when establishing the strategic plan.

Following are the **3** marketing goals of the Michigan Wheat Program:

Goal 1: Increase market demand 10 percent by 2016 through new markets, domestic and international.

- Conduct a study to establish Michigan's base of wheat products and proportion of uses in the state and across the region.
- Engage in market research to identify new value-added products and markets with growth opportunities, both domestically and internationally.
- Solicit requests for proposals to explore value-added opportunities.
- Promote the unique characteristics of Michigan-grown soft white wheat.
- Leverage the marketing advantages of the Michigan Agriculture Environmental Assurance Program.
- Research opportunities to use Pure Michigan for Michigan wheat and wheat products.

Goal 2: Make wheat production more competitive and attractive for farmers.

- Improve supply-chain efficiencies such as rapid quality testing and more delivery points.
- Minimize crop risk particularly with white winter wheat by working with the USDA Risk Management Agency, bringing special focus to indemnification and falling numbers.
- Engage in applied research to enhance profitability including priority on increased yield, more precision agronomic practices, improved guidelines on harvest, storage and handling, and better data on flour quality from Michigan wheat.

Goal 3: Engage in advocacy and education on behalf of Michigan wheat in a way that speaks to current and potential markets.

- Educate legislators, policy-makers and other leaders about the importance of wheat to Michigan's economy.
- Ensure Michigan wheat is represented at programs about the future of food and agriculture.

Read on below to see what has been done to date in addressing these goals...

MICHIGAN WHEAT PROGRAM SECURES MARKETING GRANT TO LOOK AT THE FUTURE OF WHEAT

In addressing goals of the strategic plan, the Michigan Wheat Program applied for and received its first-ever grant to look at economic development of the state's wheat industry during the 2014-15 fiscal year.

The grant, which was actually increased to more than \$76,000 to broaden its scope, was awarded in a competitive scramble among many organizations, from a \$2.25 million fund jointly administered by the Michigan Department of Agriculture and Rural Development and the Michigan Economic Development Corporation.

It gives the check-off a big step toward the first of its three strategic marketing goals: To increase market demand through new products in domestic and international markets. The study, being done for the wheat check-off by MSU's Product Center Food-Ag-Bio, will look first at the varieties and quantities of red and white wheat grown in Michigan, along with current and potential milling capacity in the state.

MSU will also research and outline wheat varieties that are preferred by various end-users, and possible areas of economic opportunity for Michigan's wheat industry, especially through some of the more boutique industries like distilling, artisan breads and ethnic foods.

One group particularly interested in the report and partnering on the project is the Lansing Economic Area Partnership (LEAP), a mid-Michigan business promotion agency. LEAP is looking for information and incentives to expand wheat processing in mid-Michigan using locally-grown wheat. The Lansing area – like many other areas – has several new businesses making craft beer and spirits. And Lansing will be used to develop a model that can be utilized across the state in making the linkages between wheat markets and processors. By having the information on market size and location, wheat can be moved or processed across the state based on what makes the most sense.

Statewide, having additional information about the market demand for wheat production and processing will help farmers to better understand the potential wheat can play in their farm's profitability.

The report will be released at the Michigan Wheat Program's Annual Winter meeting in March 2016.

MICHIGAN WHEAT PROGRAM HITS HUGE FARMER GOAL: RISK MANAGEMENT COVERAGE NOW ADEQUATE FOR 'FALLING NUMBER' LOSSES



A very important effort of the Michigan Wheat Program was its work that resulted in the USDA Risk Management Agency providing special consideration for Michigan white wheat when it comes to falling numbers.

The multi-year effort which began with some tweaks by RMA was fully realized just a few months ago and took effect in September 2015 as a major change to crop insurance.

Getting USDA RMA to recognize the significant reduction in Michigan white wheat value caused by falling numbers – and including that figure in risk calculations – was a complex effort that took multiple years, much data analysis and strong support.

Achieving it ticks off one of the board's three strategic marketing goals and should make growing wheat more appealing.

Change began with wheat farmers

What may seem like a small change was actually a huge feat. The board heard loud and clear that the inequity of falling number crop insurance coverage was a problem. The Michigan Wheat Program developed a broad coalition of partners including Michigan Farm Bureau to work through the issue.

Early on a change was made by the USDA Risk Management Agency, but very quickly farmers realized it was still not enough. The Michigan Wheat program hired a consultant, who was well-versed in crop insurance issues, and he worked through the issue and facilitated change.

Thanks to participation from millers and elevators, more than 41,000 observations representing 53 million bushels of wheat were submitted to Watts and Associates. All of this information was kept confidential and only the results and trends were shared with the MWP or RMA.

The data clearly showed the discrepancy for Michigan growers, and USDA-RMA made a programmatic adjustment that took effect for the 2016 crop that was planted this fall.

The change in the county special provision USDA-RMA is now using for Michigan, allows a farmer to use his actual price received in valuing production for Michigan white wheat with falling numbers below 200. For numbers above 200, the published discounts will be utilized but have been adjusted to better match actual historical discount values.

This change only affects white wheat, as there was not enough data received from elevators and millers on red wheat losses for RMA to make that change. However, now that the process is better understood and contacts have been made the board is watching the red wheat falling number issue and is working on DON numbers and that coverage shortfall.



Research – in the lab, in the field – is key to future success.

The Michigan Wheat Program board went through a strategic planning process to ensure check-off dollars were directed to the most important areas of research.

Applied and basic research to advance the Michigan wheat industry was a founding principle for the Michigan Wheat Program. It is still the check-off's top priority for the future, especially as it relates to quality and yield.

The MWP research program actively addresses these strategic goals:

Goal #1: Fund research to increase grain yields 25 bushels/acre by 2018 by:

- Emphasizing high-management practices.
- Doing more field research in more locations.
- Identifying best wheat genotypes for high-management.
- Finding varieties for difficult sites, including dry or wet soils.
- Promoting precision agriculture.

Goal #2: Fund research to reduce risk including:

- Relaying research results to farmers.
- Improving crop quality by minimizing byproducts.
- Advocating for better quality-based crop insurance.
- Identifying strains with better disease resistance.
- Advancing weather forecasting tools.
- Focusing on water management.

Goal #3: Create an infrastructure that has:

- A successful Michigan wheat research program.
- A MSU wheat agronomist to integrate research areas.
- Encourages collaboration among researchers, agribusinesses and farmers.
- A new wheat initiative.
- Creation of a wheat advisory board that causes collaboration across wheat interests including:
 - MSU College of Agriculture • Michigan Agri-Business Association • Michigan Millers Association
 - Michigan Crop Improvement • Private seed companies • Crop input companies • Consumer food companies

Goal #4: Elevate MSU's wheat breeding program to a premier research institution by:

- Funding postdoctoral research.
- Encouraging new, accelerated breeding technologies.
- Developing multi-departmental wheat projects.
- Recruiting wheat research that is integrated across the farm-to-food spectrum.
- Getting involved in regional and national wheat improvement programs.
- Developing intellectual property research agreements.

2014-15 RESEARCH PROJECTS

Improving Nitrogen Management in Wheat Using Remote Sensing, Dr. Bruno Basso.

Budget: \$24,000

Spotting new opportunities with agricultural drones

In a second year partnership with the MSU Department of Geological Sciences, Dr. Bruno Basso used unmanned aerial vehicles (UAVs) – also called drones – as another approach to bring precision agriculture to Michigan wheat.

Basso's long-range theory is that UAVs may become a new type of crop scouting tool, giving farmers an early head's up on nutrient deficiencies, disease, nitrogen deficiency and even winter kill.

During this year's project, Basso utilized the UAV to monitor aerial symptoms of varied rates of nitrogen. He also monitored and rated symptoms in plots inoculated with *Fusarium* head blight, leaf rust, *Septoria* leaf spot, and *Stagnospora* leaf blotch to observe fungicide responses.

The resulting values were run through algorithms to see which formulas were the best predictors of plant status, biomass and yield in the plot. While the drone was able to detect *Fusarium* head blight on a few stalks, the plot experienced only modest disease and the trial was not as robust as was expected.

Basso monitored two of Martin Nagelkirk's plot trials at five different stages of the growing season and private wheat fields in Portland, Mich.

In monitoring nitrogen trials at these various stages, Basso found a pronounced difference between 80 and 120 lbs/acre of nitrogen – occurring at a date early enough that additional nitrogen application would have been feasible.

This type of information could change a farmer's yield, making a practical application of UAVs. As this type of technology becomes more readily available, it is imperative to have the research so farmers can best utilize the data and be more informed about the potential advantages of Precision Agriculture in terms of a farmer's profitability and sustainability of the cropping systems.



Fig 1. Image taken over a wheat and wheat field using MSU UAV on May 30, 2014.

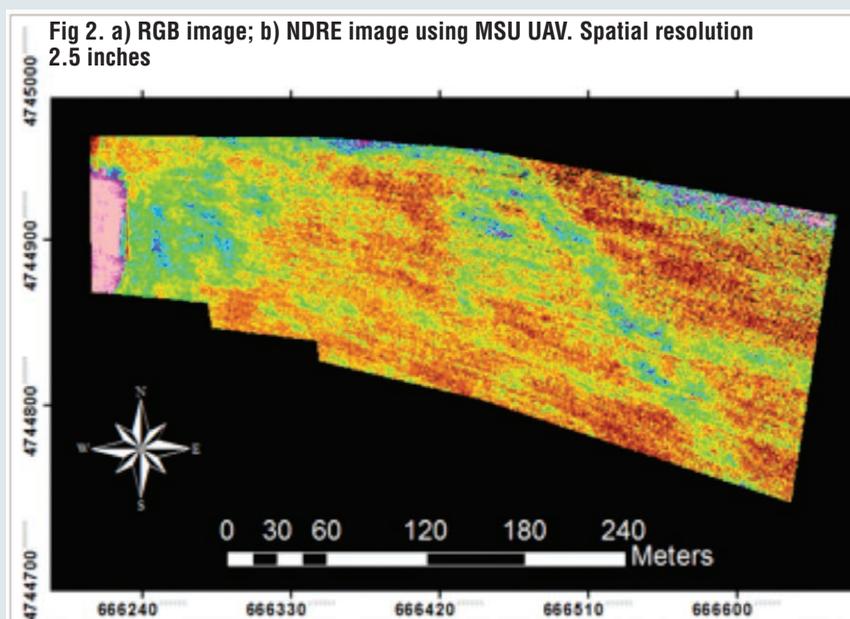


Fig 2. a) RGB image; b) NDRE image using MSU UAV. Spatial resolution 2.5 inches

Diagnostics of Wheat Samples, Dr. Jan Byrne.

Budget: \$2,325

Year Three: MSU Plant Diagnostic Lab Evaluates Farmers' In-field Wheat Problems

In 2014-15 the Michigan Wheat Program continued its partnership with MSU's Plant Diagnostic Services Laboratory. This venture allows farmers to submit samples of diseased or damaged wheat that they cannot readily identify on the farm.

The lab provides rapid results to farmers, along with possible mitigation or crop improvement strategies. It also works with MSU wheat educator Martin Nagelkirk on field issues including nutrient and drainage problems.

In 2015, the lab received 25 samples from 15 counties. These were analyzed for disease and abiotic issues.

Symptoms on half the samples submitted were due to nutritional deficiencies or pH issues, and were forwarded on to the MSU Soil and Plant Nutrient Lab for additional review. Other identified problems included *Stagnospora* blotch, leaf rust, head scab, nematodes and cold damage.

Results of wheat samples have been summarized for the last three years, to give the Michigan Wheat Program board an early warning if a new disease pops up across the state and to provide input for the research program. To see reports from the last three years visit miwheat.org/research/diagnostics.

Continued Evaluation of Oilseed Radish Added to Wheat to Increase Wheat Yields in Michigan, Dr. Dean Baas

Budget: \$9,424

The Future of Oilseed Radish as a Wheat Cover Crop: Positive, but not Yet Definitive

This was the third year of Dean Baas's field trials using oilseed radish as a cover crop interseeded with wheat. For the last two years, the project has been conducted in five locations across the state: Bay City, Centreville, Monroe, Ravenna and MSU's Kellogg Biological Station (KBS) in Hickory Corners.

Results from 2012-13 showed a promising yield increase when oilseed radish was interseeded with wheat. The 2013-14 project validated the first year, looked at optimal timing of oilseed radish seeding, and expanded Baas's work to the multiple locations.

For 2014-15, Baas looked at two oilseed radish planting dates (early and late) at all sites; and at KBS he evaluated three different seeding rates.

Results on cooperator farms (large scale trials) have shown consistent yield increases over the last three years. However, the multi-rate seeding trials at the small-scale KBS plots have had inconsistent results.

Baas's team is still trying to determine exactly how oilseed radish benefits the wheat and why the effect isn't being seen at KBS.



Using Cover Crops after Wheat to Improve Soil Health, Dr. Kimberly Cassida.

Budget: \$18,861

Cover crops + forage sale after wheat harvest = higher profitability

Dr. Kim Cassida, professor with the Department of Plant, Soil and Microbial Sciences, continued to investigate the value of cover crops planted immediately after wheat harvest.

Other research indicated that leguminous cover crops post-wheat could fix 100 pounds of nitrogen per acre into the soil – at an eye-popping value of \$26 million across Michigan – plus generate sale proceeds from the forage crop.

Many farmers do not plant a cover crop post-wheat harvest and leave the soil bare until planting a cash crop the next spring.

This situation, researchers say, fails to take advantage of a 60- to 90-day window of good growing weather and doesn't take advantage of a cover crop's nitrogen-fixing abilities.

Not using a cover crop also opens the soil to water and wind erosion, encourages weed competition, and actually encourages carbon and nitrogen loss from the soil.

For farmers seeking best practices, the question is: Which cover crop is best after wheat harvest?

Cassida's two-year project to address that question was funded through a partnership with MSU's Project GREEN, which matched Michigan Wheat Program's funds.

Rotation one was plagued by cool wheat-growing weather, which delayed wheat harvest and subsequent cover crop planting by a month. Despite unfavorable weather, forage dry matter yield was 2 ton/acre or more for oat-pea mix, sudangrass and frost-seeded red clover when cut in October 2014. Corn grain yield in 2015 was not affected by cover crop species or harvest, indicating that doublecropping wheat and cover crops is feasible. A second wheat-cover-corn rotation is underway to confirm results.

Testing Soft Wheat Varieties in Michigan, Dr. Eric Olson

Budget: \$10,000

Bonus Round: Testing new Western varieties of soft white wheat

Funding from the Michigan Wheat Program supported field testing 27 new varieties of soft white spring wheat that were developed jointly by the University of Idaho and Washington State University. The varieties were tested in two Michigan locations during 2015: The MSU Agronomy Farm in East Lansing (Eric Olson) and the Saginaw Valley Research and Extension Center in Richville.

Results were just in at press-time: Field trials identified several varieties that show good adaptation to Michigan. The best varieties appeared to be ID01405, which yielded 104 bushels/acre in Richville and 52.5 bushels/acre in East Lansing. And Melba, a club variety, that yielded 95 bushels/acre in Richville.

The highest-performing Western varieties demonstrated early maturity, resistance to lodging and resistance to *fusarium*. Many of the varieties demonstrated severe lodging in Michigan. "Heading" for the earliest varieties was just 10 days behind the earliest soft winter wheat varieties already grown here, Olson reported.

Identifying new soft white spring wheat varieties could provide Michigan wheat farmers with alternatives to grow soft white winter wheat in years with a late fall that do not allow planting or for those with sparse stands in the spring.

Improving management of wheat diseases, short- and long-term solutions, Dr. Martin Chilvers.

Budget: \$40,000

Evaluating kick-back fungicide action in controlling head scab development

As one of the most vexing problems with wheat, head scab (*Fusarium graminearum*) is a “target” for Michigan Wheat Program research. Half of the funds dedicated to disease research by the board go toward better scab control.

This multi-year project by Dr. Martin Chilvers of MSU's Department of Plant, Soil and Microbial Science, expanded Michigan's participation in the multi-state wheat scab initiative led by The Ohio State University. Martin Nagelkirk conducted head blight research in the thumb, as part of that initiative.

The additional Michigan Wheat Program funding for Chilvers' project allowed a more controlled setting near the MSU campus. Chilvers conducted his trials under high disease pressure by applying additional scab inoculum and mist irrigation.

Two commercially-available soft white winter wheats – one partially scab resistant (DynaGro 9242W) and one susceptible (Ambassador) – were tested along with two advanced lines from Dr. Eric Olson's breeding program, in a nice bit of collaboration.

The primary goal was to look at the effect of fungicide timing around flowering relative to the development of head scab. Fungicide was sprayed at flowering, and at 2-, 4- and 6-days post flowering.

In the 2014-15 trial, Chilvers found that fungicide could be applied up to six days post-flowering with comparable control of scab. This research helps address one of the most commonly asked questions regarding head scab posed by growers: how late during the flowering period can fungicides be applied and still effectively reduce DON?

In addition, yield for all varieties tested was better when treated with fungicide. DON results on wheat from these plots were pending at press time. The project is continuing for another year.



Undergraduate student inoculating *Stagonospora* screening nursery at the Mason farm.

Diversification of Corn and Soybean Crops with Quality and High-Yield Wheat Rotations, Tom VanWagner of the Lenawee County Center of Excellence.

Budget: \$10,850

Lenawee County Center of Excellence continues to Look at Double Cropping Wheat with Soybeans & Crop Rotations

This was the third year of Michigan Wheat Program support of the Lenawee County Center of Excellence. The Center has a long-running project to evaluate the optimal rotation schedule for wheat, soybeans and corn. Most Michigan farmers grow wheat about every 5th or 6th year, according to the Center, which is researching the economic benefits of using wheat every three years in a high-management system.

The project, headed by Tom VanWagner is evaluating such variables as cover crops, row spacing, fertilization, fungicide, plant populations, tillage practices and wheat varieties. The team is also closely monitoring soil quality and biology to determine optimal crop rotation. The plots are in replicated strip trials on the South-east Michigan Raymond and Stutzman and Bakerlad farms.

Also involved in the project and funded by the Michigan Wheat Program are Dr. Laura Lindsey of The Ohio State University (OSU) and Eric Richer of Fulton County OSU Extension, who are researching the opportunities of double cropping and the financial benefits even with a reduced yield of wheat and soybeans.

Impact of weed management timing on frost-seeded clover survival, weed control and winter wheat yield, Dr. Christy Sprague.

Budget: \$8,000

Investigation: Do fall/spring herbicide applications damage wheat or a frost-seeded clover cover?

MWP-funded research indicates that cover crops – most notably red clover – benefit wheat production in several ways. Other projects indicate that herbicides are helpful in controlling weeds that compete with wheat, plug harvesters and cause dockages.

This two-year project by Christy Sprague, of MSU's Department of Plant, Soil and Microbial Services, looked at the nexus of these two areas: How do fall and spring herbicide applications impact a clover cover crop, wheat and ultimately wheat yield?

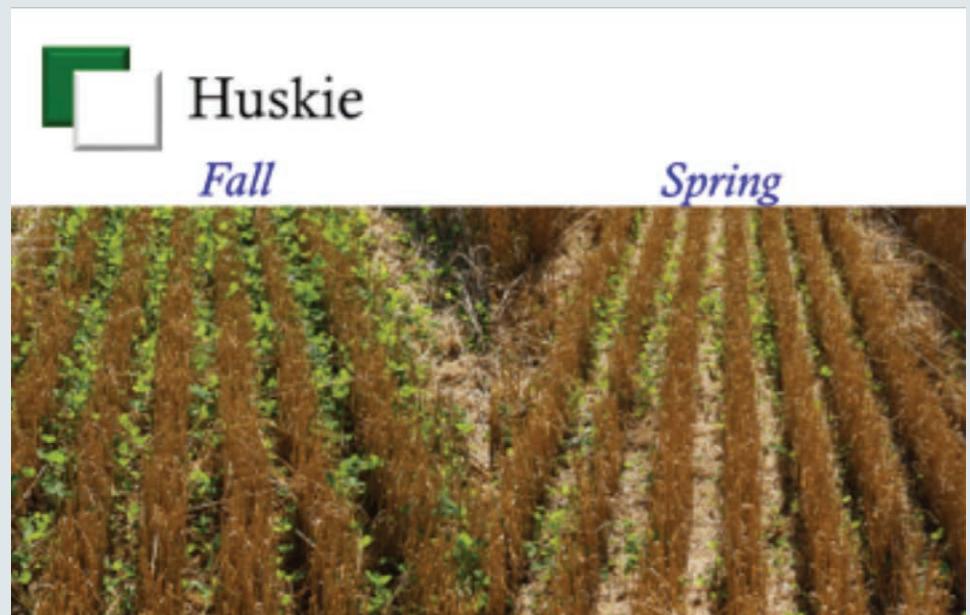
The first year examined the impact of six different herbicides: Affinity BroadSpec, Huskie, Osprey, PowerFlex, Clarity and 2,4-D applied either in the fall or spring on frost-seeded clover survival, weed control and wheat tolerance.

The second year examined the same treatments as the first year with four additional treatments: MCPA applied in either the fall or spring and fall applications of Affinity BroadSpec or Huskie applied in the fall followed by a spring MCPA application.

Significant findings showed that 2,4-D applied in fall resulted in significant injury and >25% yield reduction and therefore should not be used. All fall herbicide applications and spring MCPA were relatively safe for frost-seeded clover establishment. However, any of these herbicides applied in the spring, with the exception of MCPA, caused significant injury and stand reduction of the clover cover.

The additional treatments the second year of Affinity BroadSpec or Huskie applied in fall, with MCPA in spring, resulted in good clover establishment and good weed control. Sprague was summarizing this research in a farmers' fact sheet at press time that will be available on the Michigan Wheat website at www.miwheat.org.

Differences in clover populations between fall and spring applications of Affinity BroadSpec and Huskie.



Preharvest herbicide application effects on wheat harvestability, Dr. Christy Sprague.

Budget: \$10,000

Studying which preharvest herbicide eases harvest

To keep “green stuff” from plugging up combines, this project studied which preharvest herbicide treatments were most beneficial. In addition to ease of combining, the study looked at foreign material in the harvested wheat, which causes dockages at the elevator.

Christy Sprague of MSU’s Department of Plant, Soil and Microbial Sciences evaluated seven different preharvest herbicide treatments on ‘Sunburst’ soft red wheat. The treatments were applied in mid-July, when the wheat was mature and under 30 percent grain moisture.

Treatments included: Clarity; 2,4-D; Aim; Sharpen (currently not registered); Roundup PowerMax; Roundup Power Max + Sharpen; and Roundup PowerMax + Aim.

Sprague particularly looked at effects of treatments on lambsquarters and ragweed.

Three treatments were found to be highly effective in desiccating (drying out) ragweed in three days after treatment: Sharpen and Sharpen + Roundup. By 15 days after treatment all Roundup treatments desiccated common ragweed.

Roundup PowerMax was needed to desiccate lambsquarters, and required at least 15 days after treatment.

Treatments containing Roundup PowerMax harvested less foreign material, and had more favorable test weights and seed moisture. Yield was not impacted by preharvest herbicide. This study will be repeated in 2016.



Genotype and Environmental Variation in Phenolic Content and Antioxidant Activity of Michigan-Grown Soft Wheats, Dr. Perry Ng

Budget: \$23,994

A first look at nutraceutical properties of new wheat varieties

In this multi-year project, Perry Ng, of MSU’s Department of Food Science and Human Nutrition, evaluated the nutraceutical qualities of emerging wheat seedlines.

While the MSU Wheat Breeding Program looks at yields, disease resistance, hardiness and other properties of wheat, the MSU-Michigan State Millers Association program looks intensively at the milling and baking properties of six to eight wheat varieties.

These programs and others help decide which varieties make it out of the laboratory and into commercial seed markets.

Until now, Michigan wheat breeders have not considered the dietary health properties of new wheat varieties.

Consumers – and therefore food manufacturers – are very interested in having more antioxidants (natural food compounds that reduce free radicals and aging of body cells) and phenols (natural food compounds that make other body enzymes more effective) in their daily diets.

Ng specifically looked at phenolic content in the bran and flour segments of new wheat varieties to document their antioxidant properties. Long-term, the project will correlate wheat genetics and environments that favor phenolic and antioxidant development.

In the first year of the project (2013-14), Ng evaluated 57 varieties from the MSU Wheat Breeding Program. That data found a broad range of phenolic and antioxidant properties.

In the second year’s research, being wrapped up at press time, Ng’s team was looking for the environmental and genotype relationships.

Antioxidant and phenolic data could be used to decide which seedlines are commercialized. Wheat varieties with nutraceutical properties could be developed into new products for niche markets.

Genomic selection and population parameter assessment to Michigan soft winter wheat, Dr. Eric Olson.

Budget: \$48,200

Developing Michigan wheat varieties using genomic selection

As part of an ongoing commitment to enhance the MSU Wheat Breeding and Genetics Program, the Michigan Wheat Program has continued support for work by Eric Olson, of the Department of Plant, Soil and Microbial Sciences.

Phenotypic evaluation is the conventional method to evaluate new strains of wheat. This involves ten years of planting, selection and observation. Today, the breeding program can apply selection years earlier by evaluating the new wheat strain's DNA in genomic selection. This new method can lead to new wheat varieties up to five years sooner.

This project is helping bring genomic selection into the wheat breeding program to better predict a new line's yield potential, resistance to *Fusarium*, pre-harvest sprouting, as well as important quality and processing traits.

The resulting new evaluation process is both more rapid and more cost effective. Genomic selection can cost only \$7 per sample vs. \$400 per variety per year when planted and observed in the field.

This project is a long-term commitment to the MSU wheat breeder position, which is jointly supported by the Michigan Wheat Program, Michigan Crop Improvement Association and the Eastern Soft White Wheat Council.

Advanced Testing of Michigan Wheat Varieties, Dr. Eric Olson

Budget: \$20,000

High-Management Trials Produce Very Positive Results for Third Year

2015 was the third-straight year that the Michigan Wheat Program sponsored high-management wheat research plots in five locations across the state (Huron, Ingham, Lenawee, Sanilac and Tuscola counties). The high-management research project is part of MSU's Wheat State Performance Trials.

This year, the trials demonstrated significant positive benefits for high-management practices. Specifically, the average yield across all high-management trial sites increased 14.5 bushels/acre (20.5 percent), when compared with control (conventional) plots. Test weights were up slightly in high management, too.

The high-management trials included all 64 commercial varieties and 32 experimental wheat varieties that were part of the 2015 Performance Trials.

Results from 2015 show that the five high-management sites averaged anywhere from 112.4 bushels/acre in Sanilac County to 82.3 bushels/acre in Lenawee County. The control (conventional) Ingham county plots averaged 69.5 bushels/acre, which was slightly less than the 2014 yield.

Comparing the high-management and conventional-management plots in Mason, Mich., the average yield per bushel increased 20.5 percent with a slightly higher test weight and slightly less grain moisture at harvest.

Results of all three years of high-management trials sponsored by the Michigan Wheat Program may be reviewed at www.miwheat.org/research/high-management. MSU researchers and the wheat check-off recommend reviewing at least three years of trial research when making decisions for your farm.

Definition of High-Management Production

High-management wheat systems are those which include fertilizer and fungicide treatments. High management is being explored across the US and Canada, and many Michigan farmers are already adopting it.

Dr. Olson's and Lee Siler's high-management trials for the Michigan Wheat Program include:

- An additional 30 lbs. of nitrogen per acre (28 percent N);
- Quilt® at Feekes stage 8.5-9; and
- Prosaro® applied at the average flower date in each location.

Rust Proofing Michigan Wheat, Dr. Eric Olson.

Budget: \$8,000

"Rust proofing" new Michigan wheat varieties via DNA screening

This first-year project seeks to get ahead of a virulent strain of rust that is damaging wheat around the globe. Ug99 stem rust has the potential to devastate 80 percent of the world's wheat acreage and unpredictable epidemics can cause severe yield losses.

MSU wheat breeder Eric Olson's goal is to ensure that new strains of wheat being developed at MSU are resistant to Ug99 stem rust, and resist many other strains of leaf and stripe rust. Olson's team is working to phenotype current wheat strains and new varieties under development for resistance to stem rust. The Michigan Wheat Program-funded project will screen about 2,500 lines of wheat in a disease nursery in the Upper Peninsula.

In this year of the project, Olson screened 875 wheat varieties for susceptibility to stem and leaf rust including 90 varieties from the Michigan performance trials and 740 varieties from MSU breeding lines.

Randomized trials were planted both at the MSU leaf rust nursery in Mason, and at the stem rust nursery at the MSU Upper Peninsula Research and Extension Center in Chatham.

This project continues the heavy focus on rust resistance in wheat variety development. This allows the MSU Wheat Breeding and Genetics Program to cull out problematic varieties early, and focus on genotypes that have high yield potential, superior processing traits and resist a variety of diseases.



Harnessing a Novel Head Scab Resistance Response in Spring Wheat, Dr. Frances Trail and Dr. Eric Olson

Budget: \$37,692

Can micro-helpers protect a wheat crop?

That's the question Dr. Frances Trail, of MSU's Department of Plant Biology, hopes to answer in a unique plot of land known as the Kellogg Long-Term Ecological Research site. For 27 years this research plot at MSU's Kellogg Biological Station (KBS) in Hickory Corners has been continuously rotating corn, soybeans, and wheat in four production techniques: Conventional, no-till, reduced input and organic practices.

This cultivation pattern makes the site uniquely suited for Trail to study the emerging scientific field of microbiomes associated with a wheat rotation.

Microbiomes may be compared to the community of microorganisms that exist in one's gut: Some good, some potentially harmful to us. It's possible that some organisms within the KBS wheat microbiome could be very good at suppressing diseases or physiological problems in wheat. Just as with probiotics for human health, microbiome research for plants has become an area with significant promise for improvement in plant health and efficiency.

MWP has funded this project to help Trail's team collect wheat at the site and begin to isolate the microorganisms within the KBS wheat microbiome. The team has already identified more than 1,150 bacteria and over 550 fungi.

Further work will consider which microorganisms help protect against *Fusarium* in the lab, followed by greenhouse trials. Long-term, these microbes could be turned into seed treatments or foliar sprays that may protect a farmer's wheat crop.

Intermediate Stage Quality Testing of MSU Wheat Breeding Lines for Milling, Baking and End-Use Qualities, Dr. Perry Ng

Budget: \$42,764

Knowing more about new wheat seedlines sooner

As part of its breeding research line-up, the Michigan Wheat Program has funded this project to evaluate new soft wheat seedlines for various desirable traits. While it takes 10-14 years to develop a new variety, often the new "talent" can be picked out early in the process.

The MSU Wheat Breeding Program routinely looks at many traits of new wheat varieties, including yields, disease resistance, hardiness and other concerns. MSU's program also tests about 150 lines of wheat annually for milling and baking qualities in an early stage testing program. In addition, about six advanced seedlines are evaluated annually in the MSU Wheat Quality Testing Advanced Lines Program (WQTALP), a 10-year-old agreement between MSU AgBioResearch and the Michigan State Millers Association.

All of this data narrows down the number of lines being developed. But what if some good traits get lost in the bigger picture? The industry has been concerned that seedlines with some desirable properties may be dropped from MSU's breeding program because they do not meet other parameters such as disease resistance or yield.

In this Michigan Wheat Program-funded project, Perry Ng, of MSU's Department of Food Science and Human Nutrition, established a new Intermediate Stage Quality Testing Program to evaluate 30-40 newer wheat seedlines for unique qualities that would be desirable to millers and bakers. By capturing and preserving some of these unique qualities – which might otherwise disappear from the MSU breeding program – the traits could be incorporated into other more desirable seedlines in the future.

Tests performed by Ng during intermediate testing include looking at grain properties (falling number, kernel hardness, moisture, test weight, and milling), flour properties (protein, ash, wet gluten, viscosity, and particle size), and dough, baking and other properties.

In the project's first year, the intermediate test protocol was established and applied to the seedlines in MSU's Wheat Breeding Program. Intermediate screening will be repeated in future years, generating more data to help decide which varieties make it into farmers' fields.

Winter Wheat Soil Fertility Systems: Planting Date to Nitrogen Rate and Everything in Between, Dr. Kurt Steinke.

Budget: \$40,204

September planting dates give best wheat yield; nitrogen results a mixed bag

In its second year of a two-year commitment, this project came closer to specific recommendations for planting wheat and applying nitrogen to maximize wheat yield.

Kurt Steinke, of MSU's Department of Plant, Soil and Microbial Sciences suggests that winter wheat yield depends on three factors related to timing of planting and nitrogen:

- Planting date can be a dominant factor in increasing Michigan's winter wheat yield potential;
- Planting earlier often ensures greater tiller production and has even allowed for reductions in nitrogen application rates; and
- Effectiveness of nitrogen application timing is weather dependent and should be adjusted based on in-season weather variables.

Specifically, the research team learned that planting on or before September 30 was optimal most years and produced the greatest number of autumn tillers along with the least reduction in those tillers the following spring due to sufficient hardening off prior to winter dormancy. Spring-grown tillers are typically not as effective in boosting yield.

Steinke found that wheat planted in mid- to late-October did not tiller at all prior to winter dormancy in some years as air and soil temperatures decreased beyond the optimal range for tiller production, thus reducing accumulated growing degree days.

While autumn starter nitrogen applications continue to be a much discussed topic, the team found that an additional 25 pounds of nitrogen applied in autumn did not affect grain yield.

Steinke also looked at whether honing in on split nitrogen applications between green-up, Feekes 5, and a combination of the two may affect overall production.

The spring of 2014 and 2015 were both relatively dry up until mid-May or later, resulting in few if any differences with regard to the above listed nitrogen application timings. A 50/50 nitrogen split between green-up and Feekes 5 has produced the most consistent yield results over the last several years. In dry spring conditions, split N applications haven't consistently paid dividends due to difficulties in getting nitrogen from the soil to the plant. When spring soil moisture has been plentiful or excessive, splitting nitrogen applications has previously resulted in an increase of 8 to 10 bushels an acre compared to a single green-up application.

Over-Activation of Wheat Native FHB Resistance Genes in US Wheat, Dr. Mariam Sticklen

Budget: \$69,020

Traditional Hybrids May Hold Key to Fusarium Resistance

Fusarium head blight (FHB) has plagued US wheat, and wheat crops around the globe, for decades. This fungal pathogen has significant implications for both quality and yield for wheat growers. No truly resistant varieties exist, although a handful of strains are recognized as less susceptible.

After 10 years of research across three continents with less-susceptible varieties, the FHB resistance trait – which spans multiple genes in the wheat genome – has not been successfully transferred to more desirable and elite strains of wheat.

Incomplete mapping of the wheat genome has also inhibited a breeding solution to FHB.

Dr. Mariam Sticklen, of MSU's Department of Plant, Soil and Microbial Sciences, is bringing her experience in breeding other small grains to this important wheat issue. Her expertise in genetics should allow her to identify genes which provide *fusarium* resistance in wheat varieties from other geographies with the goal of transferring these traits to the wheat strains that are ideal for Michigan's climate.

Now in the second year of a multi-year project, Sticklen plans to develop a traditional hybrid solution to *fusarium* head blight in wheat.

Assessment of Allergenic Potential of Wheat Lines from the MSU Breeding Program, Dr. Venu Gangur, Dr. Perry Ng and Dr. Eric Olson

Budget: \$40,000

Wheat allergenicity and level identification

Much has been made of the gluten-free food movement, which has resulted in shelves full of new gluten-free grocery items – even though only 1 percent of the US population has celiac disease. Another 0.2 percent may have a wheat allergy. But many more adults believe they have or do have wheat sensitivities, sometimes called non-celiac gluten sensitivity.

This project of Venu Gangur and Perry Ng of the MSU Department of Food Science and Human Nutrition, in collaboration with Eric Olson of the MSU Department of Plant, Soil and Microbial Sciences, is applying yet another screen to wheat varieties.

The two-year project will screen new varieties in the MSU Wheat Breeding Program for genetic material that contributes to the allergenic potential of wheat. It is possible that hypoallergenic or nonallergenic wheat lines may come out of the breeding program that have market viability for addressing diet-specific consumer preferences.

Isolation and Characterization of Starches from Michigan-grown Wheats for Value-added Applications in Foods, Dr. Perry Ng and Dr. Eric Olson.

Budget: \$65,440

Looking down the road at starch content in wheat

While farmers are often looking at the performance qualities of wheat in the field, it's also important to look farther up the food chain to learn how new wheat varieties will perform for millers, bakers, food manufacturers – and consumers themselves.

This project, headed by Dr. Perry Ng of the MSU Department of Food Science and Human Nutrition, and Dr. Eric Olson, of MSU's Department of Plant, Soil and Microbial Sciences, is a two-year look at the starches in new wheat varieties.

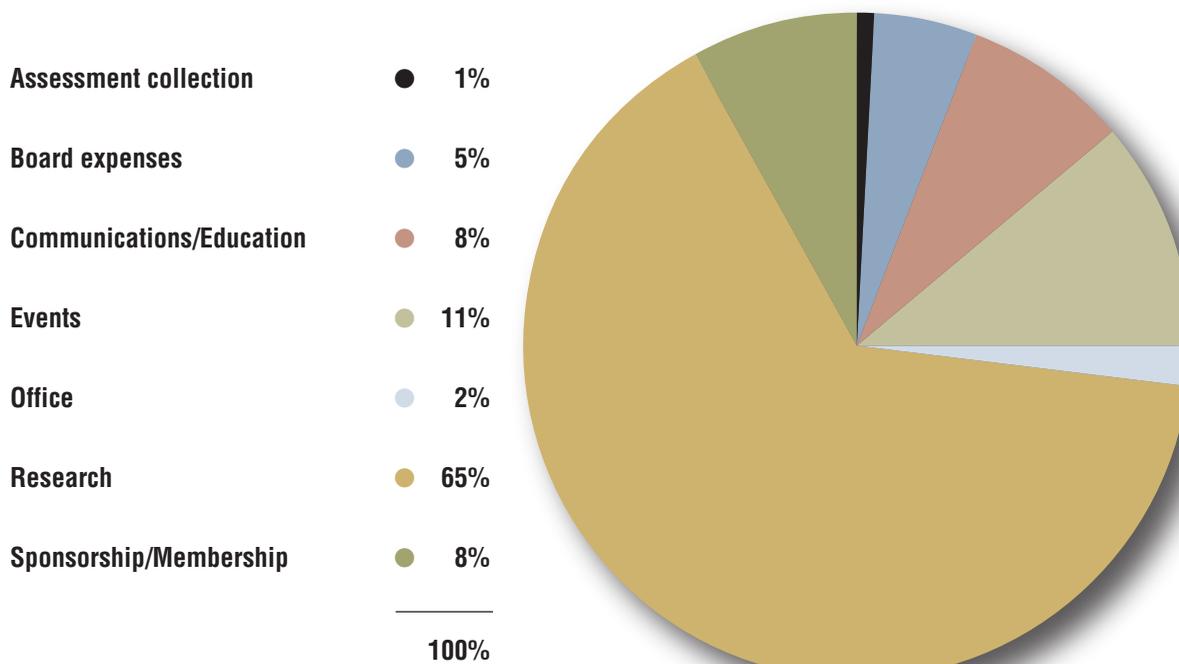
The levels and types (amylose vs. amylopectin) of starch in a wheat strain, are important to industrial bakers and food ingredient buyers because they affect the quality of finished foods, and could someday impact health claims and provide new market opportunities for Michigan wheat.

Interestingly, the proposal notes that a fraction of starch, known as resistant starch (RS) escapes digestion in the small intestine, and passes into the large intestine for microbial fermentation – a very positive development. Early research shows RS could be helpful in lipid metabolism and colon health, and may play a role in preventing Type II diabetes. Starches with higher amylose content tend to have higher RS content.

Ng's team points out that there is no information available about the types of starches in Michigan-grown wheat. They will develop a series of metrics for evaluating starches, and then apply these screens to new and existing wheat varieties to understand their starch properties.

Long-term, the project could allow selection of wheat varieties that may have unique market applications based on their starch properties.

THE MICHIGAN WHEAT PROGRAM BOARD OF DIRECTORS SPENT FUNDS IN THE FOLLOWING AREAS:



Michigan Wheat Program's Farmer Perks

The Michigan Wheat Program offers very important perks for farmers. Read on, to make sure you are aware of and taking advantage of them.

GETTING PAID FOR MAEAP VERIFICATION

The Michigan Wheat Program board is in full support of the Michigan Agriculture Environmental Assurance Program (MAEAP), which is managed by the Michigan Department of Agriculture and Rural Development.

While the MAEAP process is free, the wheat check-off board recognizes that it may be time-consuming for many farmers. Since June 2013, the board has offered a one-time \$50 financial award for documented wheat farmers (one award per farmer, not per farm) who are currently growing wheat and have obtained their first MAEAP cropping system verification.

When MAEAP verification has been achieved, a farmer may claim the one-time \$50 incentive. To claim the \$50 incentive, farmers should download and review the forms under the MAEAP tab. Details at <http://www.miwheat.org/farmers-perks/>.

MSU PLANT DIAGNOSTIC LAB: HELPING FARMERS SORT OUT PROBLEMS

The Michigan Wheat Program formed an innovative partnership with MSU's Plant Diagnostic Laboratory by providing funding that allows farmers to submit wheat samples free of charge. The lab diagnoses crop health, cultures pathogens, tests for viruses, and looks for nematodes, insects and other problems.

The Michigan Wheat Program covers the cost of analysis, and provides submittal forms that may be downloaded from its website. Details and forms are found at <http://www.miwheat.org/farmers-perks/>.

At the end of the season, the Michigan Wheat Program board receives a synopsis from the lab of issues faced by growers throughout the year. The board then reviews those along with its research program to ensure they are funding the projects to keep growers on the cutting edge.

FREE EDUCATION PROGRAMS

All that learning, networking and a free lunch! The Michigan Wheat Program Winter Grower Meeting and Summer Field Day are the best wheat-focused workshops in Michigan.

The Summer Field Day focuses on plot tours and check-off funded wheat research for Michigan growers. The winter program includes nationally- or internationally-renowned speakers, and covers a wide range of wheat production and marketing topics.

To capture the content of these events, the website has been updated to add the handouts, videos and PowerPoints from the event presenters. Find these "virtual" events at <http://www.miwheat.org/education/previous-events>.

GET YOUR FREE NEWSLETTER

Wheat Wisdom is the monthly e-newsletter of the Michigan Wheat Program. It is available free to all wheat farmers and industry stakeholders who sign up for it.

The newsletter includes important wheat production and market information, news on educational programming, and other information pertinent to Michigan wheat farmers.

To sign up for *Wheat Wisdom*, visit the bottom of the home page at <http://www.miwheat.org>.

NAWG MEMBERSHIP

The Michigan Wheat Program negotiated its membership with the National Association of Wheat Growers to allow all Michigan wheat farmers to automatically be members of NAWG. This allows farmers to get membership rates to conferences, enter the National Wheat Yield contest, have their children apply for scholarships and take advantage of other opportunities.

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**Mark your calendar
for the 2016
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March 9.**