



ORGANIC AGRICULTURE IN WISCONSIN: 2021 STATUS REPORT

Prepared by the UW-Madison Center for Integrated Agricultural Systems and
the UW-Madison Organic and Sustainable Agriculture Research and Extension Program

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This report is a joint effort of the Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP), the University of Wisconsin-Madison (UW) Center for Integrated Agricultural Systems (CIAS), and the UW Organic and Sustainable Agriculture Research and Extension Program.

The findings and policy recommendations in this resource are those of the authors and do not necessarily represent the views of UW-Madison or the Wisconsin Department of Agriculture, Trade and Consumer Protection.

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FOREWORD

We are proud to present the Organic Agriculture in Wisconsin: 2021 Status Report, which provides a look into the state's organic production, processing, and marketing activities. Our state is an organic agriculture leader. From our diverse farms to our sophisticated processing industry, Wisconsin is known for its organic expertise and infrastructure.

When the 2019 Certified Organic Survey results were released in November 2020, the statistics gave us valuable insights into one of the state's most important industries. Wisconsin ranks second nationally for the number of organic farms, just behind California, and is home to more than 8% of the nation's organic farms. From 2016 to 2019, the number of Wisconsin acres in organic production grew 12.6%, with nearly 251,000 acres now in production. Wisconsin ranks fifth in total dollar value of organic sales, reaching \$269 million in 2019, a growth of 5.2 percent since 2016. We hope you share our excitement for the past and potential growth in this sector of Wisconsin's agricultural industry.

The University of Wisconsin-Madison College of Agricultural and Life Sciences and the Wisconsin Department of Agriculture, Trade and Consumer Protection are proud to partner on research, training and technical assistance for organic farmers. We greatly appreciate the volunteer efforts of the members of Wisconsin's Organic Advisory Council to provide recommendations that will help ensure the long-term success of the industry.

We hope this report serves as a resource for potential consumers, prospective farmers, agribusinesses, and policymakers. Thank you for your continued support of Wisconsin's organic agriculture industry.

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2021 STATEMENT BY THE WISCONSIN ORGANIC ADVISORY COUNCIL

Wisconsin has been a leader in organic agriculture for over a decade. According to the United States Department of Agriculture National Agricultural Statistics Service's 2019 Certified Organic Survey¹, Wisconsin has maintained its position as second in the nation with respect to its number of organic farms in the state. The strength of the Wisconsin organic industry relies on diverse production as well as a wide variety of operations, from small farmers market producers to an organic processor selling over a billion dollars of product a year. Our consistent growth has been driven by strong consumer demand for high-quality products from both within the state and beyond our borders. In addition, Wisconsin crop and livestock producers are motivated to seek organic certification out of a desire to steward their land and animals using the environmentally beneficial and humane practices that define organic production.

A hallmark of the success of organic agriculture is its resilience, which is strengthened by its diversity of production and marketing approaches. 2020 was a year which presented challenges for food and farming everywhere. Shutdowns and slowdowns related to the COVID-19 pandemic caused institutional and restaurant sales to drop precipitously. However, as people stayed home and cooked more meals in their own kitchens, we saw a growth in organic retail sales and direct sales from farmers to consumers. In Wisconsin, subscription-based community support agriculture farms (CSAs) found themselves sold out of shares early in the season. While developing safe ways to interact with customers during the pandemic was challenging, farmers innovated and adapted, reaching their customers through new channels and methods, such as online ordering and no-contact drive thru pickup sites for produce, grains, and livestock products. t

2019 U.S. organic sales were \$55.1 billion according to the Organic Trade Association, up from \$43.3 billion dollars in 2015². Organic consistently outpaces growth in


the overall food marketplace, demonstrating its strength with consumers. Wisconsin is a leader in many high value organic food categories, including dairy, meat and eggs, fresh and processed vegetables and grains as well as packaged and prepared foods.

Wisconsin also leads in organic agricultural research and education, a benefit for both organic and nonorganic producers. A growing focus on soil health as a critical element in clean water, climate change resilience, and farm viability relies on many foundational organic principles. Organic educators are providing guidance and inspiration to all operators looking for new ways to protect and improve their farms' resources.

Of course, challenges remain. Both domestic and foreign operations have been attracted to organic markets by higher prices; some have been caught selling millions of dollars of fraudulent organic products. This additional product has led to downward price pressure, especially for organic grains. Inconsistent interpretations of organic livestock regulations across the U.S. have allowed some large dairy operations in the west and south to avoid implementing organic regulations that are strictly followed on Wisconsin family farms. This unfair competition only adds stress to an already burdened dairy sector. Organic processing opportunities, especially in the livestock sector, were already over capacity and not able to meet current demand. Despite these challenges, however, there is much room for optimism in organic, as evidenced by the increase in the transition of more organic acres on both established and new organic farms throughout the state.

The Wisconsin Organic Advisory Council works in concert with the Wisconsin Department of Agriculture Trade and Consumer Protection and federal and state agencies to enhance opportunities for the growth of organic agriculture, processing, and marketing in our state. The Wisconsin Organic Advisory Council's quarterly meetings are open to the public, and we encourage you to contact us with your comments, suggestions, and concerns.

Organically yours,



¹ https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/Organics/index.php

² <https://ota.com/news/press-releases/21328>



EXECUTIVE SUMMARY

Wisconsin is a national leader in organic agriculture, not only in the number of certified organic farms and processors within the state, but also with respect to the diversity of organic products raised and sold. According to data from the USDA National Organic Program (NOP), Wisconsin had 1,516 certified organic operations, up from 1,334 in 2015³.

The organic market continues to expand, both within the U.S. and globally. Organic food sales in the U.S. hit \$50.1 billion in 2019, up 4.6 percent from the previous year, outpacing the general market growth of 2.3 percent⁴. In 2020, within the immediate onset of the COVID-19 pandemic, organic produce sales rose more than 50 percent as consumers stocked up on groceries, peaking at a 20 percent increase in sales in the spring of 2020⁵. Demand for organic milk and eggs also increased, as well as double-digit growth in the sales of frozen organic foods.

The 2019 Organic Survey conducted by the USDA National Agricultural Statistics Service⁶ provides a wealth of data about the organic sector nationally, as well as in Wisconsin. This survey shows that Wisconsin remains a top state in the nation in total number of organic farms, second only to California. Wisconsin ranks fourth behind California, Montana, and New York in the amount of certified organic land with 250,000 acres. Wisconsin ranked fifth in dollar value of organic sales in 2019, totaling over \$269 million.

Wisconsin ranked as the second state for the number of organic dairy farms, with 530 organic dairies, up from 429 in 2014. Wisconsin also ranks among the top states in the number of organic field crop farms (#1), organic livestock and poultry farms (#1), organic hog and pig farms (#1), organic layer chicken farms (#1), organic vegetable and melon farms (#2), and organic cranberry farms (#3). The state ranks seventh in the nation for the number of farms raising organic berries and other fruits (not including

apples or grapes), as well as seventh with respect to organic floriculture crops and bedding plants.

Wisconsin ranks second in the nation for the number of non-organic and organic/exempt farms with transitioning organic acres, which is a key indicator of the potential for growth in a state's organic sector. The vast majority of organic farms within the state (80%) plan to maintain or increase their organic production.

A critical element to the continued strength of organic agriculture—not only in Wisconsin, but across the nation—is its ability to be resilient. Resilience is a characteristic inherent to many aspects of organic agriculture, with its emphasis on integrating diverse production and market approaches, building soil health, and adopting systems-based approaches to management. While organic farmers and the organic industry have recently faced several challenges testing that resilience—including regulatory enforcement, lack of farm and processing infrastructure, adaptation to extreme weather, and the COVID-19 pandemic—Wisconsin organic agriculture continues to demonstrate its strength.

Wisconsin's organic agriculture industry remains a vibrant and resilient feature of the state's agricultural landscape and economy. Wisconsin hosts a number of rural "organic hotspots", clusters of counties with high numbers of organic operations enabling farmers to provide mutual assistance and support. Analyses have indicated that a county's poverty rate drops by 1.3 percentage points, unemployment rates at the county level are lowered by 0.22 percentage points, per capita income is increased by \$899, and the median household income is increased \$2,094 when the county is part of an organic hotspot⁷. Poised for continued growth in both acres and markets, the organic industry can continue to serve as an important economic driver for the state, supporting the vitality of our rural communities.

3 <https://organic.ams.usda.gov/integrity/>

4 <https://ota.com/news/press-releases/21328>

5 <https://ota.com/news/press-releases/21328>

6 https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/Organics/index.php

7 https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/Organics/index.php



ORGANIC AGRICULTURE IN WISCONSIN BY THE NUMBERS

According to the USDA National Organic Program (NOP), the federal agency that administers organic regulations, Wisconsin had 1,612 organic farms and 392 processing facilities in 2020, reflecting a continued upward trend since 2009 (Figure 1)⁸. In terms of geographic distribution, NOP maps reveal that certified organic farms reside in nearly every county of the state with four western counties (Clark, Monroe, Vernon, and Grant) hosting a concentration of between 61 and 232 operations each (Figure 2). Organic processors are also well distributed, although numbers are fewer in northern Wisconsin counties (Figure 3).

Figure 2. Distribution of certified organic farms in Wisconsin, 2019.

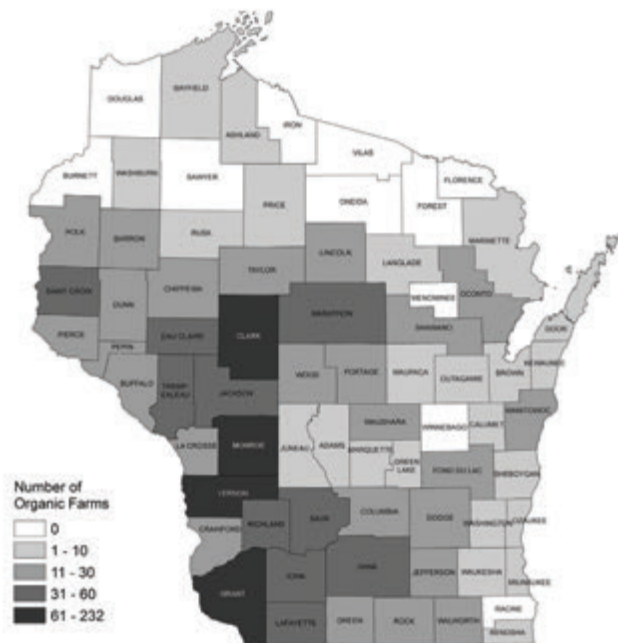
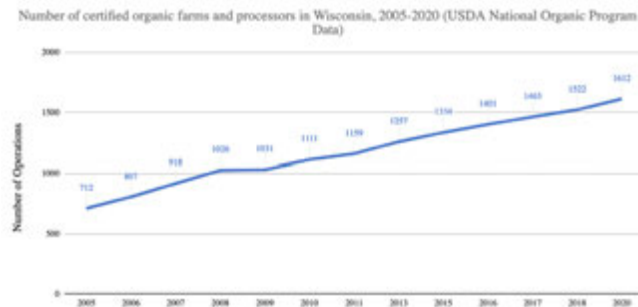


Figure 1. Number of certified organic farms in Wisconsin, 2005-2020 (USDA National Organic Program Organic Integrity Database).



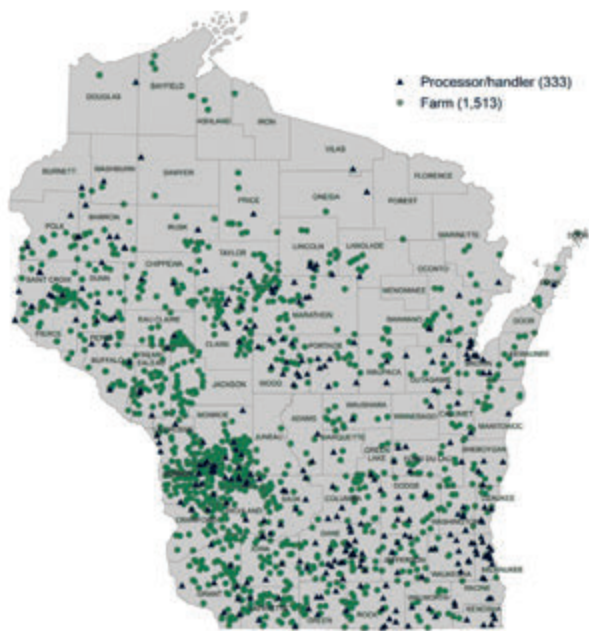
ORGANIC COST SHARE IN WISCONSIN

The 2002 Federal Farm Bill provided funding for a cost-share program that helps organic farmers and processors pay for their organic certification. Funding comes from the federal government, through the USDA National Organic Program. The program is administered through the Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP) (see datcp.wi.gov/Pages/Organic-Certification-Cost-Share-Program.aspx). In 2020, DATCP reimbursed 848 organic certified operations for \$531,702 with a 53 percent participation rate in the program. DATCP has had excellent support from staff at certifying agencies to both encourage participation and to assist in providing client information used to process the applications. This cooperation is invaluable and DATCP would not have had this degree of participation without their help.



8 https://ota.com/sites/default/files/indexed_files/OTA-HotSpotsWhitePaper-OnlineVersion.pdf

Figure 3. Wisconsin certified organic farms and processors/handlers, 2019.



The USDA National Agricultural Statistics Service (NASS) 2019 Organic Survey provides a wealth of national and state level data about the organic sector⁹, including a more detailed picture of certified and transitioning farms, as well as organic farms grossing less than \$5,000 annually from organic sales (and therefore exempt from the organic certification requirement). The self-reported data differs from that reported by the USDA NOP, which is gathered as part of a mandatory reporting requirement. The response rate to the NASS 2019 Organic Survey was 74 percent, and the results include statistical adjustments for nonresponse, misclassification, and coverage.

The 2019 NASS Organic Survey demonstrates Wisconsin's continued strength in organic agriculture. Wisconsin excels in both the numbers of farms involved in organic agriculture (Figure 4) and the breadth of organic products raised and sold. Wisconsin remains the second state in the nation in total number of organic farms with 1,364 farms, second only to California with 3,012 farms (Figure 4). Wisconsin ranks fourth behind California, Montana, and New York in the number of organic acres, with 250,940 organic acres, an increase from 228,605 organic acres in 2016. Wisconsin ranked fifth in dollar value of organic sales, with the value of organic commodity sales from Wisconsin farms increasing from \$255 million (2016) to \$269 million (2019) (Figure 5).

Of the 1,364 self-reporting organic farms in Wisconsin,

55% sell all of the products they produce as organic; 45% sell some percentage into a conventional market, representing either transitioning farms or parallel (both conventional and certified organic) operations.

Figure 4. Number of organic farms per state in 2019 (2019 Organic Survey).

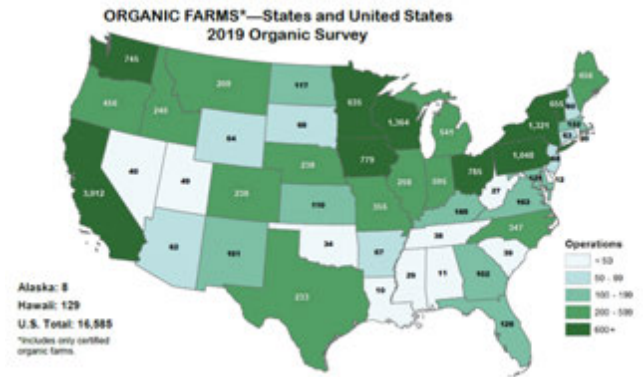
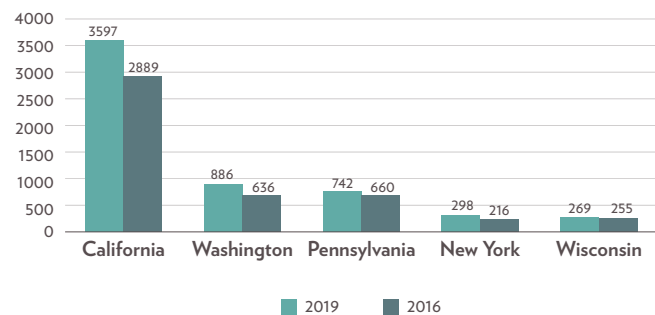


Figure 5. Top states in dollar value of organic sales (millions), 2019.



Wisconsin ranks second in the nation for the number of organic dairy farms, with 530 organic dairies (Figure 6), and fourth for the number of organic dairy cows (Figure 7). Wisconsin ties for first in the nation for organic beef farms (69 farms) (Figure 8) and third in the nation (behind California and Texas) for organic milk sales, with \$125.7 million in 2019, up from \$110.5 million in 2014. Sales of organic dairy cows, beef cows and all other cattle and calves in Wisconsin totaled \$25 million in 2019, up from \$19.7 million in 2014.

9 https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/Organics/index.php

Figure 6. Top states in number of organic dairy farms, 2019.

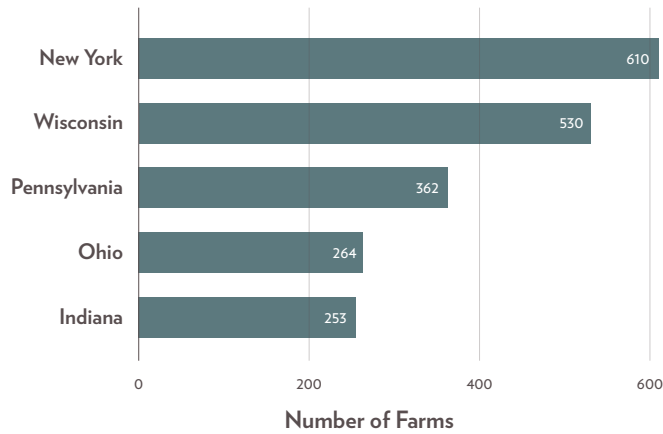


Figure 9. Top states in number of organic chicken (layer) farms, 2019.

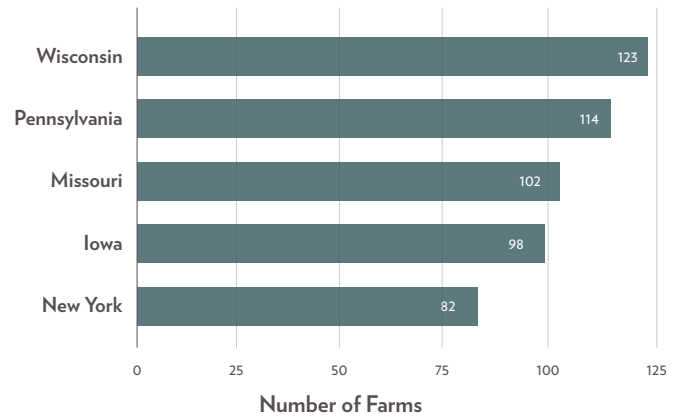


Figure 7. Top states in organic milk cow numbers, 2019.

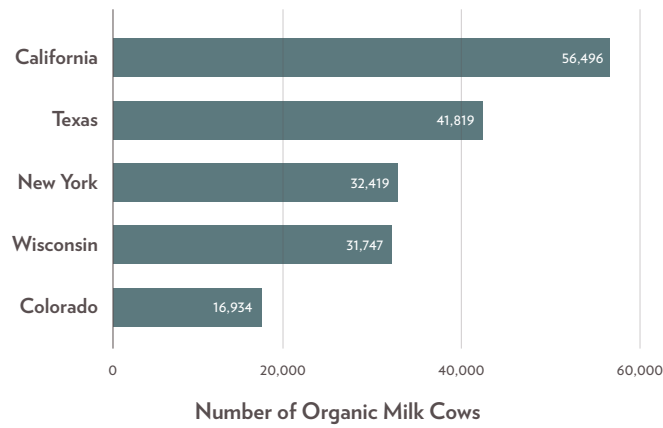


Figure 10. Top states in number of organic chicken (broiler) farms, 2019.

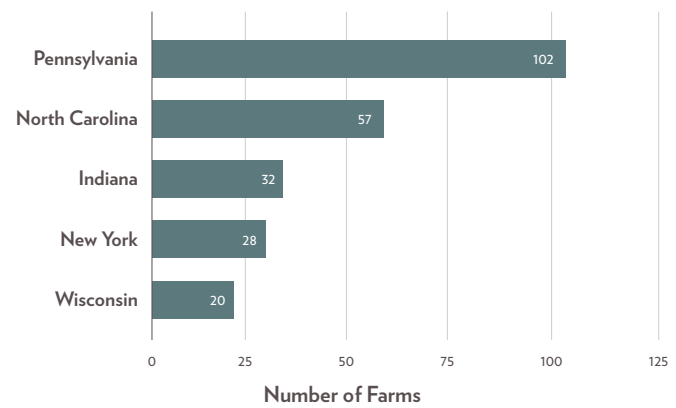


Figure 8. Top states in number of organic beef farms, 2019.

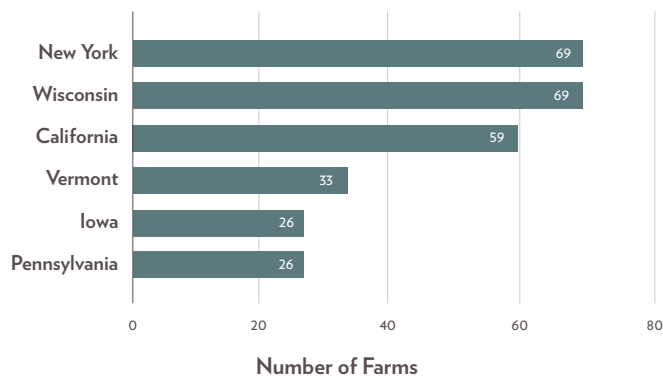
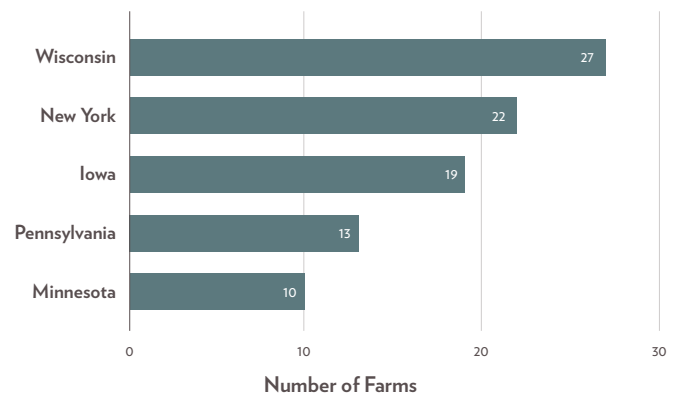


Figure 11. Top states in number of organic hog and pig farms, 2019.



Wisconsin also has a strong organic poultry sector with 123 organic egg-producing farms, the most of any state in the nation (Figure 9), and 20 certified organic broiler farms, placing it fifth (Figure 10). Wisconsin tops the nation in the number of organic hog and pig farms (27 farms) (Figure 11), and places second in the total number of organic hogs and pigs (1,026 animals).

Wisconsin is home to 311 certified organic vegetable operations, behind only California (Figure 12). Wisconsin ranks seventh in the nation for the number of farms raising organic berries and other fruits, not including apples or grapes (Figure 13), and seventh with respect to organic floriculture crops and bedding plants (Figure 14) worth

some \$1.4 million in 2019. The state ranks third for the number of farms growing organic cranberries, and second in the nation with respect to organic cranberry acres (Figure 15).

Figure 12. Top states in number of organic vegetable farms, 2019.

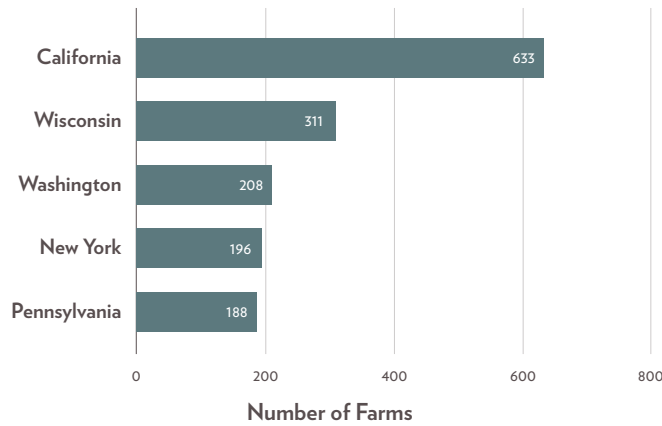


Figure 13. Top states in number of farms producing organic fruits (not including apples and grapes), 2019.

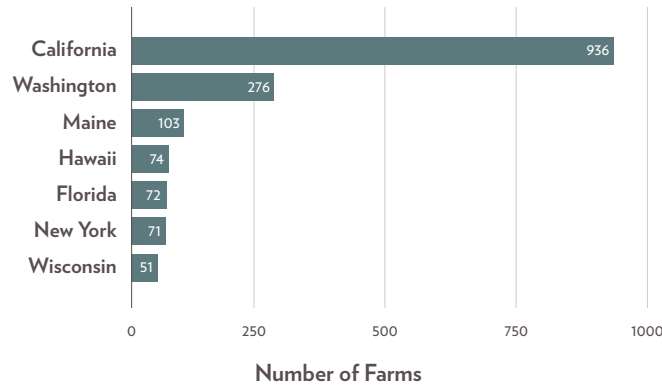


Figure 14. Top states in number of farms producing organic floriculture and bedding plants, 2019.

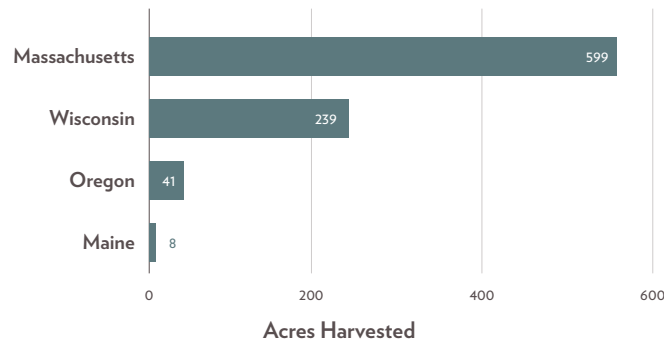
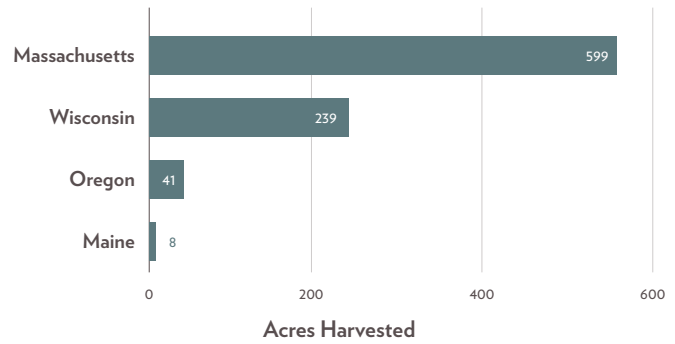


Figure 15. Top states in acres produced of organic cranberries, 2019.



With 1,113 farms, NASS reports Wisconsin ranking first in the nation for the number of farms growing organic field crops, up from 909 farms in 2014 (Figure 16). Sales from all organic field crops are valued at \$30.6 million, with corn for grain or seed valued at \$12.3 million, up from \$9.4 million in 2014. Other important Wisconsin grown organic field crops include barley, corn for silage, hay, oats, rye, soybeans, and wheat (Figure 17).

Figure 16. Top states in number of organic field crop farms, 2019.

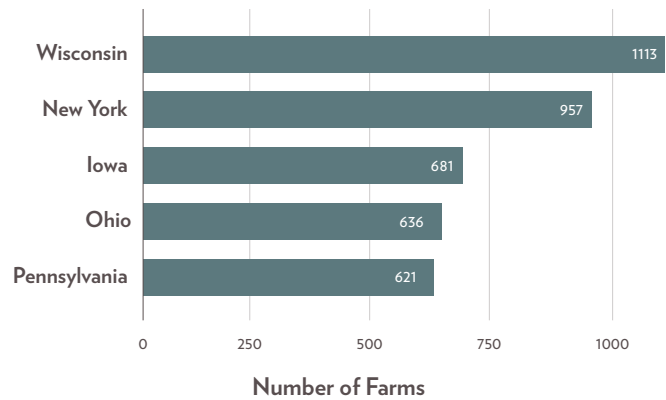
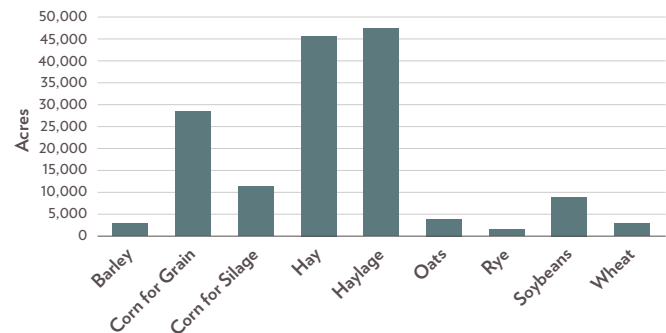


Figure 17. Acres harvested of selected organic field crops in WI, 2019.



The number of farms and acres transitioning to organic production is an important indicator of continued growth in a state’s organic sector. Wisconsin ranks second with respect to transitional organic land operated on non-certified organic farms (an indicator of new farms on the path to becoming certified organic) with 50 farms (Figure 18). Wisconsin is seventh in the nation with respect to transitional organic acreage (Figure 19), with 2,278 acres in transition on these farms as of the end of 2019. Wisconsin ranks second for the number of certified and exempt organic farms adding organic acres by transitioning land to organic production, with 180 existing certified organic farms (Figure 20) transitioning 7,294 more acres in the state.

Figure 18. Number of non-organic farms with transitioning acres, 2019.

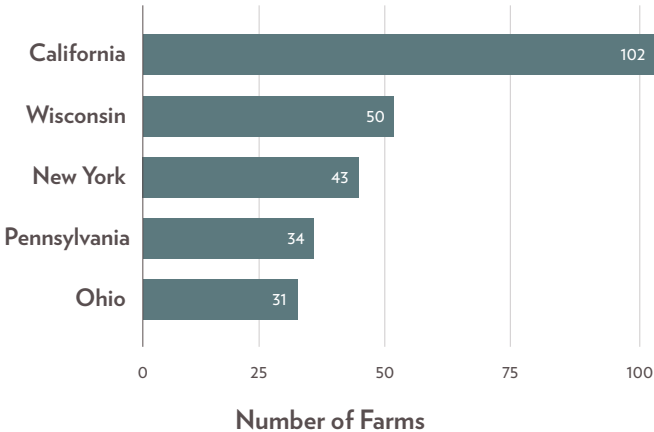


Figure 19. Top states in numbers of transitioning organic acres, 2019.

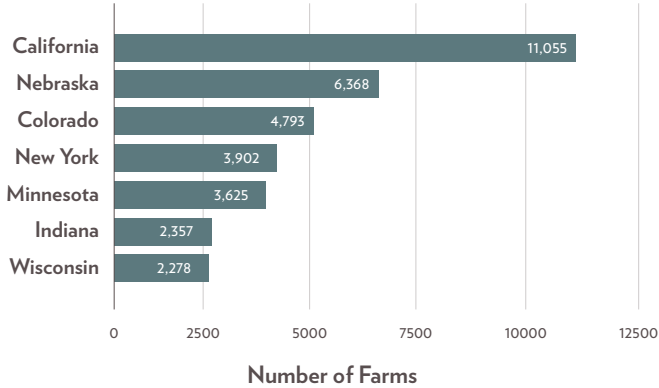
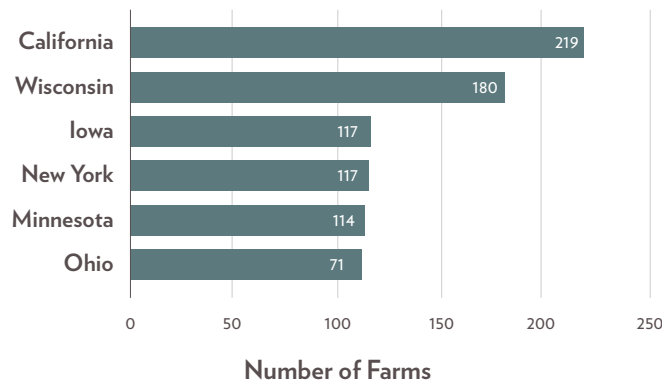
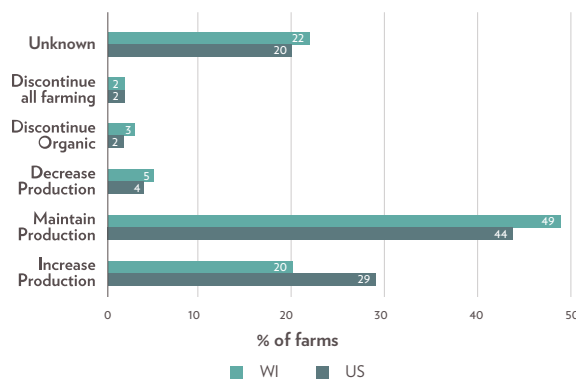


Figure 20. Top states in number of organic and exempt farms with transitioning organic acres, 2019.



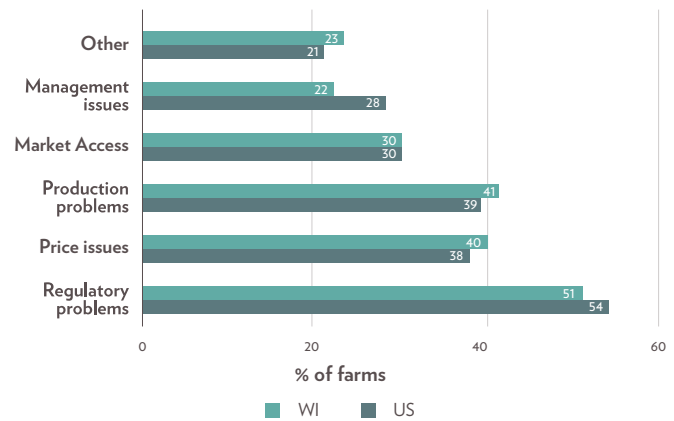
Organic farmers in Wisconsin reported five-year production plans similar to those of farmers across the U.S. (Figure 21). Compared to the nation, slightly fewer Wisconsin farmers are planning to increase production and slightly more plan to maintain the same level of production. At both state and national levels, only a small proportion of farmers intend to reduce or stop farming organically.

Figure 21. Five-year production plans of organic farms, WI and US, 2019.



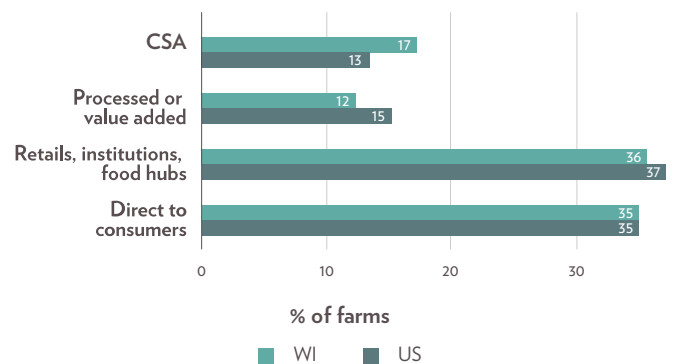
In terms of production challenges, Wisconsin farmers identified regulatory problems, followed by price issues and production problems as key; in line with barriers identified by organic farmers across the US (Figure 22).

Figure 22. Major production challenges on certified organic farms (WI and US), 2019.



Wisconsin has a lower percentage of sales made directly to retail outlets or institutions than the nation as a whole, and similar percentages of sales going directly to consumers. Compared to the U.S. as a whole, Wisconsin has a higher portion of sales to Community Supported Agriculture (CSA) markets (Figure 23).

Figure 23. Sales through specified marketing outlets (WI and US), 2019.



BACKGROUND: ORGANIC CERTIFICATION

“Organic” is a label that describes how an agricultural product is grown and handled before leaving the farm or processing facility. Farmers who grow plants and raise animals, as well as processors who create value-added products, may apply for organic certification under the United States Department of Agriculture’s (USDA) National Organic Program (NOP). The organic standards overseen by this agency, effective since 2002, address production, processing, labeling, certification, recordkeeping and inputs allowed in organic farming and processing. Additional oversight is provided by the National Organic Standards Board (NOSB). This federal advisory board, made up of 15 public appointees from across the organic community, considers and makes recommendations on a wide range of issues involving the production, handling and processing of organic products. The USDA organic regulations not only specify what materials farmers and processors can use during the production of organic goods, but also adherence to certain production practices. To be eligible for organic certification, prohibited materials must not be applied to land for 36 months prior to planting an organic crop. Soil-enhancing practices, such as management to reduce erosion and improve soil quality, must be demonstrated and documented by organic farmers. With respect to

inputs, most synthetic herbicides and pesticides are prohibited and natural products allowed, with certain exceptions within both categories, as outlined by the National List of Allowed and Prohibited Substances. Strict manure and compost guidelines, as well as a prohibition of the use of sewage sludge, align with sound food safety practices. Weed, insect and disease management practices focus on non-chemical controls such as crop rotation, variety selection, biological control, mulching and tillage. The use of genetically modified plant varieties and products are prohibited under the USDA organic regulations. Certified organic livestock must be fed organic feed and/or pasture. They cannot be treated with growth hormones or antibiotics, or fed urea, manure, or animal by-products. Organic livestock producers are required to provide their animals with species-appropriate access to the outdoors and the opportunity to practice natural behaviors. Ruminants must receive a minimum 30 percent dry matter intake from pasture during the grazing season. Practices such as dehorning and castration must be performed with animal welfare in mind, with minimal pain and stress. While the administration of antibiotics results in automatic decertification of the animal, other medications can be used, and withholding medical treatment from a sick animal to protect its organic certification is not allowed.

MARKET TRENDS

The organic market, both in the U.S. and across the globe, continues to expand. The U.S. experienced record high organic sales in 2019 of \$55.1 billion in food and non-food sectors, up 5 percent from the previous year¹⁰. Organic produce continues to be a top draw for organic consumers, with organic meat and poultry demonstrating a robust growth in demand. This increase in demand for organic meat drives demand for organic grains, such as corn and soybeans. Growth in organic purchasing is anticipated to be reported at an even more rapid pace in 2020, as organic

products saw demand exploding through the pandemic, including organic produce, milk, eggs, and packaged and frozen organic foods. An early pandemic poll in April/May 2020 documented that more than 90% of 3,188 “likely organic” shoppers reported that organic is more important than ever in their current food shopping.

¹⁰ <https://ota.com/news/press-releases/21328>



RESPONDING TO COVID-19: A TRANSFORMATIONAL SYSTEMS SHOCK

THE NEXT NORMAL

COVID-19, a low probability, high impact event, hit all points in the food supply chain. Past experience has demonstrated how such system-wide disruptions more negatively impact small independent businesses. As the impacts from pandemic continue to unfold, it remains unclear the degree to which organic farmers and their processing, distribution and market partners have been affected. Based on other examples of regional disruptions in the food supply chain, such as those experienced with the occurrence of hurricanes, we do know that independent businesses often lack the financial means to weather prolonged downturns, with thin margins and poor access to capital tending to leave independent businesses especially vulnerable¹¹. Food supply chains are regularly disrupted by extreme weather events, providing context to the response of smaller operations with respect to COVID-19. Stories from the field reveal how farmers pivoted to address changing market conditions, labor needs, and new forms of operations and communication. Strategies included accelerating decision-making, seeking new collaborations, and pursuing opportunities to upgrade operations.



From “Supply chains and COVID-19”, National Academies of Science webinar April 8, 2020, based on remarks by Anne Strauss-Wieder, North Jersey Transportation Planning Authority

A FOCUS ON OPERATIONS

Just as farmers were gearing up for the 2020 growing season, the confirmed presence of the COVID-19 virus in the U.S. required farms to reconsider everything from sourcing and selecting seed to labor needs and markets. The impact was particularly significant for diversified organic vegetable farms that rely on large crews working together in the field and pack shed, and who rely on direct-to-consumer sales such as farmers’ markets or restaurants.

Like so many other businesses, a central challenge for many farms has been continuation of operations while keeping employees, customers and family safe. Farm managers adjusted planting schedules and farm labor plans. Workflows had to be maximized for social distancing, including additional breaks to accommodate mask wearing in hot conditions. Some employers had to ask employees to limit personal activities to reduce the potential for virus exposure to other staff on the farm. At the same time, some farms were hiring larger than normal crews to accommodate the increased demand for local food, as well as increased management of on-farm sanitation and distribution flows. Expanding work crews was also necessary to prepare for the eventuality that some crew members might fall sick or need to quarantine.

Increased sanitation was a key strategy for keeping employees and customers safe. Farms that had implemented GAP (Good Agricultural Practices) and FSMA (Food Safety Modernization Act) protocols found that they had many of the necessary practices in place, although they may have chosen to increase the frequency or scope of their sanitization schedule. This required additional management and staff hours as well as the

¹¹ “Supply chains and COVID-19”, National Academies of Science webinar April 8, 2020, based on remarks by Anne Strauss-Wieder, North Jersey Transportation Planning Authority

expense of sanitizing chemicals and personal protection equipment (PPE).

MARKET DYNAMICS

Challenges for smaller and diverse farm operations were paired with a surging public interest in local and organic food. Community Supported Agriculture (CSA) subscriptions sold out widely and many farmers dramatically increased the number of CSA shares they offered. Market diversification was an important safety net contributing to the resilience of farms who lost restaurant or other institutional sales or saw diminished farmers' market traffic.

Some farms turned to on-line ordering and payment and contactless delivery to keep their farmers markets viable. For example, Madison's Dane County Farmers Market moved to a less crowded site with drive-through access. Poor internet accessibility or lack of technology was a barrier for some farmers, leading to dramatic losses in sales. While sales through direct-to-consumer outlets were strong, the pandemic did bring new farm expenses resulting from changes related to handling the pandemic, including the purchase of additional cleaning supplies, PPE, added labor, distribution costs, and new software to facilitate online ordering or delivery routing. Still, preliminary data shows that diversified organic vegetable farms remained resilient, weathering the financial aspects of the 2020 growing season relatively well.



*Above: Workers preparing ramps for sale, Spring 2020.
(Photo credit: Joel Kuehnhold.)*

“On the farm, we try to stay 6 feet away while processing seedlings or doing other work. Every employee has a mask (I have four workers) sewed by yours truly. And I do wellness checks.”

–Joel Kuehnhold, Lonely Oak Farm, Milladore, WI



Sarah Elliot, Dane County Farmers Market manager, at the new site, April 2020. (Photo credit: Michelle Miller)





COVID-19 AND THE WISCONSIN ORGANIC MEAT INDUSTRY: ENHANCING RESILIENCE THROUGH BUILDING CAPACITY

The COVID-19 pandemic hit the U.S. meat industry particularly hard. Temporary shutdowns and slowdowns at larger processing plants reduced capacity early in the pandemic. The resulting shortages of meat and increased awareness of health and nutrition among consumers drove huge market interest in locally produced and processed meat products, including certified organic.

Farmers in Wisconsin offering locally produced meat were swamped with requests from both consumers and small retail outlets. “March and April brought an onslaught of emails,” reported Paul Maggio of Starry Nights Farm near Burlington, Wisconsin in Kenosha County. “We sold our entire inventory, planned to last into the fall, by May.” Maggio, his wife, Marisa, and two daughters raise 100% grass fed beef and pastured pork, which they direct market to consumers in Chicago, Milwaukee and southeastern Wisconsin.

While high sales are a goal for direct marketers, unanticipated high demand creates big challenges, especially in the meat industry. Most beef cows are ready for processing into meat cuts at 18 months of age, requiring careful long-term planning to ensure product availability. Pork takes 5 to 6 months to raise from birth to butchering, and broiler chickens 2 to 3 months. Runs on product such as the Maggios’ experience led to bottlenecks at processing, and a lack of supply down the road while animals matured. “We plan to double our pork harvest of animals in 2021,” Maggio noted.

Under COVID-19, the Maggios changed their business model from working with different outlets selling retail cuts to selling mostly bulk animals (whole, halves, quarters), often directly to consumers. While the new model reduced gross income, it vastly reduced the amount of work needed and overall profitability was maintained. In fact, the Maggios hope to continue this marketing model in the future.

Cooperatives such as Organic Valley/CROPP (Coulee Region Organic Producer Pool) also saw the need to pivot due to the changes brought forth by COVID-19. The Organic Prairie label of CROPP, which sells significant

volumes of Wisconsin-raised organic beef, pork, and poultry country-wide, saw a huge spike in demand in 2020, especially from online vendors, leading to the need to quickly shift from supplying product to restaurants and institutions to selling the product retail. “We were able to shift production away from foodservice or ingredient sales during the pandemic,” explained Dave Greening, OMC General Manager at Organic Valley/Organic Prairie. Because of that, our fill rates with retail customers stayed higher than many of our competitors in the meat industry.” With Wisconsin lacking the infrastructure to meet the processing needs of CROPP, Organic Prairie beef and dairy cull cow processing occurs just over the border in Minnesota, with organic pork and poultry processed even further away.

PROCESSING BOTTLENECKS AND SUPPLY LAGS: “EVERYONE WANTED MEAT THIS SPRING.”

Dale Peacock of Red Hoof Farm in Port Wing, Wisconsin (Bayfield County) has been marketing private label organic meat since 2014. Like the Maggios, he experienced a rush of demand in 2020 for his meat but struggled to get animals processed in a timely manner. “We generally book processing dates a couple of months out,” Peacock shared. “Our entire inventory was cleared out in March and April, and I didn’t have another butcher date scheduled until August. I called around but couldn’t get any earlier dates scheduled.” Peacock had to turn customers away.

Peacock describes 2020 as one of his most challenging years. “New customers, old customers, retails, everyone wanted meat this spring. We sold whole animals, halves, quarters. I built my business on selling cuts of meat retail and some wholesale. By early summer I had nothing to sell and no way of getting more. If I didn’t have other ways to make money on my farm, selling hay, heifers, by June or July lack of cash flow would have closed my farm down.”

Peacock travels 170 miles away to deliver his animals to the federally inspected and organic certified Crescent Meats in Cadott, Wisconsin, Chippewa County. President and CEO Wayne Lautsbaugh reported that his crew processed 2,500 animals in 2020. He hopes to see Crescent Meats build

capacity to process 3,500 animals in 2021. “We weren’t able to book all of the requests we had in 2020. We hope to add a second harvest day every other week” Lautsbaugh shared. Along with many of the slaughter plants in the state, Crescent’s butcher dates for most of 2021 are already filled.

A SHORTAGE OF CERTIFIED ORGANIC PROCESSORS AND LABOR

Organic meat producers face an additional layer of challenge related to the ability to sell their product as organic. With only ten large animal and three poultry slaughter plants doing organic processing in the state, demand for organic certified services currently outstrips supply. “There is more interest in organic processing in the state of Wisconsin than what is now occurring” reported Wisconsin’s Extension Meat Specialist, Jeff Sindelar. “There is lots of lost opportunity in the state because the organic processing isn’t there.” Sindelar pointed out that the organic meat industry is important, especially as it supports the organic milk industry through the processing of cull cows.

But, with overall demand for organic meat processing services remaining high, little incentive exists for business owners to do the additional work for a plant to become certified organic. “We have trouble getting the profit margin on organic that we get for conventional production. There is extra work and expense for organic, added regulations,” Lautsbaugh pointed out.

In addition, a lack of educational infrastructure inhibits slaughter facility owners from taking on organic processing. “Very few meat processors I talk to say they don’t want to do organic, but they say they don’t know how to do organic,” Sindelar said.

Paul Maggio raises his animals organically on certified organic pastures, but he can’t sell the meat as organic because the animals are not processed in an organic facility. He was pleased to be able to get butcher dates in 2020, at two local federally inspected conventional processing plants. “We plan ahead and maintain good relationships with our processors. This really helps us get processing dates when we need them,” Maggio said.

“I’d guess that about 75% of the direct-to-consumer organic meat animals grown in Wisconsin are raised organic but not slaughtered organic,” said Harriet Behar, chair of the Wisconsin Organic Advisory Board and a long-time organic inspector. “The plants just aren’t there.”

Labor sits high on the list of challenges Lautsbaugh and Sindelar see to increasing Wisconsin’s meat processing

capacity. Running a relatively small plant, Lautsbaugh listed lack of manpower as one of the key limiting factors to his ability to expand to meet demand. Meat harvesting is hard, cold work involving long hours, and too few applicants are willing to do the job.

“Meat processing work has historically been done by immigrants to the U.S.,” Sindelar reminds us. Increasing regulatory restrictions on immigration as well as a proliferation of anti-immigration sentiment over the past several years has negatively impacted meat plant workforces. “It used to be easier to find workers who wanted to work hard. Now employers have to do more negotiating to get workers to come to them,” Sindelar observed.

Farmers and processors would probably all agree with this outlook from Greening at Organic Valley: “2020 forced us to look at ways to build more flexibility into our supply chain to be able to accommodate major demand shifts, and also highlighted the important role that e-commerce will play in the distribution of food products in the years to come.”

ORGANIC PROCESSING CERTIFICATION

- Any state or federally inspected plant can certify as organic
- The plant can be certified to apply to any customers who requests organic processing, or for a specific customer who applies for the certification of processing under their name
- A Hazard Analysis Critical Control Points (HACCP) plan must be approved
- Non-organic live animals, carcass and meat must be separated from organic. Many plants process organic first thing in the morning before non-organic animals and processes are undertaken.
- Use of only organic-approved cleaning and pest control substances and methods required
- Organic handling plan approved by the certification agency
- Label approved by USDA Food Safety Inspection Service and organic certifier
- Submission of paperwork on processes and tracking
- Annual cost of certification will be \$5,000 or more per plant



ENHANCING ORGANIC AGRICULTURE'S RESILIENCE THROUGH STRENGTHENING INTEGRITY

The organic market relies on the integrity of the federal organic standards certification system. Over the last several years, questions about organic food fraud and the presence of nonorganic products being marketed as certified organic, have been featured in national outlets such as the Washington Post and the Minneapolis Star Tribune in the last few years¹². Organic farmers, industry experts, and legislators all assert the importance of enforcement of organic standards in order to ensure consumer confidence in the label and to create a level playing field for organic farmers in the U.S.

In 2020 the USDA Agricultural Marketing Service (AMS) responded to growing concerns over organic fraud with a regulatory update, “Strengthening Organic Enforcement (SOE)” (85 FR 47536). Responding to concerns over fraud noted in the 2018 Farm Bill, and the AMS update is its largest single piece of rulemaking since the implementation of the National Organic Program (NOP) regulations in 1990. The rule has the potential to positively impact the organic industry in Wisconsin and beyond.

The Organic Trade Association supports the proposed rule, emphasizing that it aims to close gaps in the current regulations, build consistent certification practices, deter and detect organic fraud, and improve transparency and product traceability. In addition, proposed provisions are aimed at assuring consumers that organic products meet robust, consistent standards and enforcement. Steve Walker, Accreditation and Industry Affairs Manager at Midwest Organic Services Association, a certification agency with many clients in Wisconsin, said, “The industry is growing faster than the regulations, so many of the rules needed to be modified. The rule was motivated by congressional action in the Farm Bill and was informed by National Organic Standards Board recommendations. It is encouraging to see so many needs of the organic industry

be addressed.” Among other actions, the proposed rule will restrict supply chain exemptions. Other provisions include improved recordkeeping, information sharing and reporting, labeling, import compliance, and training of inspection personnel.

In addition to the SOE rule, farmers, industry, and certifiers in Wisconsin are calling for more attention to ensuring that critical skills, knowledge, and experience is present and supported within the organic technical advising and regulatory spheres. Well-qualified organic inspectors and reviewers are in chronic short supply, and with increasing size and complexity of organic supply chains, efforts to develop, recruit, and retain a strong community of well-trained inspectors and reviews is essential for organic integrity. In July 2020, the NOP made a formal request¹³ that the NOSB host a community wide dialogue to develop recommendations toward building this highly trained organic regulatory and technical assistance workforce, an effort Adam Warthesen, Director of Government and Industry Affairs at Organic Valley supports. “The industry needs more people that are versed at understanding organic production and the organic industry in order to keep up with demand – it is critical to our industry not only with respect to supporting organic farms, but in maintaining our organic supply chains” he says.

ADDITIONAL REFORMS NEEDED FOR ORGANIC LIVESTOCK AND POULTRY PRACTICES RULE AND ORIGIN OF LIVESTOCK RULE

While the organic dairy and livestock sectors have continued to grow, this growth could be further strengthened by addressing certification inconsistencies. The Organic Livestock and Poultry Practices (OLPP) rule, passed on January 19, 2017 (82 FR 7042), was

12 Whoriskey, P. 2018. USDA officials said they were guarding against organic food fraud. Congress decided they need help. <https://www.washingtonpost.com/business/2018/12/20/usda-officials-said-they-were-guarding-against-organic-food-fraud-congress-decided-they-need-help/>

Belz, A. 2019. Organics detective: US farmers stalk fraudulent imports to save their markets <https://www.startribune.com/organic-farmers-stalk-fraudulent-imports/511952972/>

Belz, A. 2020. A fraud case in South Dakota throws harsh spotlight on organic grain. https://billingsgazette.com/news/state-and-regional/a-fraud-case-in-south-dakota-throws-harsh-spotlight-on-organic-grain/article_37aeead-7785-549c-abb2-325df44b0635.html

13 https://www.ams.usda.gov/sites/default/files/media/NOP_NOSB_Human_Capital.pdf

intended, along with addressing other livestock practices, to ensure that all organic poultry and egg operations provided meaningful outdoor access for chickens. The implementation of the rule was initially delayed and then it was withdrawn altogether in May of 2018. This rollback was seen by many as sending the wrong message to consumers, damaging public trust in USDA's organic label. Two pending lawsuits take the U.S. Department of Agriculture to task over its failure to put new organic livestock and poultry regulations into effect¹⁴.

Another challenge involves how organic dairy animals are transitioned to organic. In 2015, USDA published a proposed, but never finalized, "Origin of Livestock" rule, which stated that to be certified organic, after a one-time transition from conventional, a dairy farm would need to organically manage all dairy animals from the last third of gestation. Such a rule would require that all replacement animals be organic.

Steve Walker stresses the benefits of this proposed rule: "Stringent transition regulations strengthen our organic dairy industry. All farms will be held to the same regulation, rather than the two-tier approach, which has fostered an unfair system for entrance into and expansion of organic dairy production. With implementation, organic replacement animals will be in greater demand, resulting in market growth and stability for farmers selling replacements. When rule changes require organic purchases, we see the organic market rise to meet the challenge."

With broad support from the organic community, Congress included a provision in the Fiscal Year 2020 Agriculture Appropriations bill requiring USDA to finalize the long-delayed Origin of Livestock rule by June 17, 2020. USDA's

AMS missed that deadline. Warthesen explains: "This is pretty straight forward. If you have variation among certifier's interpretation of the regulations, as is the case with Origin of Livestock, you end up with competitive harm amongst market participants. In this case, certifiers that serve Wisconsin align with the view that dairy farms can do a one-time transition of animals to organic—certifiers in other states do not necessarily adhere to that interpretation."

Ensuring the integrity of organic products sold in the US is critical to the resilience of the industry, from the farmer, processor, and market perspectives. The organic industry relies on a strong regulatory framework to create a level playing field for farmers of all scales, as well as to assure consumers that organic products meet strict production standards. As the organic market continues to expand, investing in robust rules and implementation structures will be critical for maintaining organic integrity and serving US farmers and processors.



Above: Organic dairy cows on pasture (Photo credit: Kevin Mahalko)

¹⁴ <https://ota.com/livestockpractices>



ENHANCING RESILIENCE IN THE FACE OF ERRATIC WEATHER

The upper Midwest has seen an increase in extreme weather over the last decade, including unprecedented single-event precipitation occurrences and wide swings in temperatures. Changing conditions are challenging the resilience of Wisconsin's organic farms. Wetter spring and fall weather can push farmers out of their fields at critical times for field and harvest management, creating narrow windows where soils are dry enough to complete field activities. Summer drought conditions can impact crop yields. In addition, increased rainfall and warmer overall temperatures can increase pest and disease incidences, creating additional risk and management complexities.

While their use of a diversity of crops and management strategies are key to overall resilience, in some ways organic farmers can be impacted more negatively by extreme weather than their conventional counterparts. Organic farmers more often rely on the production of high-value and food-grade crops, which are more susceptible to quality issues caused by extreme environmental conditions. Flooding events within the past decades led to food safety issues, with entire fields of organic produce left unharvested. Organic grain farmers utilize cultivation as part of their weed management strategy, which necessitates field operations at very specific stages of crop and weed growth. In excessively wet years, if organic grain farmers miss critical windows for cultivation, they are left with weedy fields and compromised production, decreasing yields by 25% or more¹⁵. Organic dairy farms have struggled with winterkill in their pastures and hay fields after extremely low winter temperatures decimated alfalfa stands, leaving herds short of feed. One farmer's strategy

Kat Becker of Cattail Organics, a 50-acre certified organic vegetable farm in Athens, Wisconsin, has adopted several strategies in response to climate change. Reducing mechanization and increasing intensification are central to her approach. By eliminating mechanization, her workers can get into fields at times off limits to large machinery. She also has optimized crop yield and quality on every plant bed and has devoted more land to soil-building phases using cover crops, which has improved her ability to

manage weeds and diseases and adapt to wet conditions.

Becker has also increased the amount of area under protective structures, using both high tunnels and caterpillar tunnels to optimize moisture and temperature for her crops. These structures protect crops from unpredictable weather, including extending the growing season by offering some frost protection, and improving the predictability of a high-quality crop and stable yield.

While farmers like Becker are implementing creative climate resilience adaptations, more research and support could further help them weather the storm. Becker specifically identifies the need for more research on organic vegetable varieties adapted to the upper Midwest. In addition to excellent work like that of the Seed to Kitchen Collaborative¹⁵ at UW-Madison, Becker sees a need for work on disease resistance, flavor, and storage quality.

Other areas of concern include reduced tillage systems for organic vegetable production. Without the use of chemical herbicides, organic farms rely heavily on the mechanical removal of weeds from their fields, timely removal of which is essential to ensure a high quality, productive crop. With wet weather keeping farmers out of fields at key times during the growing season, organic yields suffer. Organic no-till systems reduce the reliance on mechanical practices for weed management. While organic grain systems have made progress in recent years improving outcomes in reduced and no-till systems, tillage still remains a central fact of most organic vegetable farms. Claire Strader, Organic Vegetable Educator for Dane County Extension, is working with farms, including Cattail Organics, to develop and evaluate multi-year rotations that may allow growers to eliminate annual deep tillage, except for every few years, replacing it with more shallow tillage and soil building practices sandwiched in between.

Becker also points to a need for improved business development support for small and diversified farms like hers. "Diversified vegetable farms need a clear idea of when to take on debt and how to structure business financing. This is a key for resilience" she says.

¹⁵ <https://seedtokitchen.horticulture.wisc.edu/>

BUILDING RESILIENCE ACROSS THE WISCONSIN'S ORGANIC FARMING LANDSCAPE

Many of the strategies adopted by Becker on her organic vegetable farm can be translated to other organic vegetable, grain, and livestock operations across Wisconsin. With a focus on diverse enterprises and markets, organic farms are poised to adapt as weather conditions change, more readily pivoting to different crops and sales outlets as challenges emerge. Conservation practices common on organic farms, such as diverse crop rotations, integration of perennial crop phases, prairie buffer strips, and cover crops, contribute to the creation of field conditions that better buffer against the impacts of extremely wet or dry conditions and pest pressure in a given year. Continued research and education efforts related to organic reduced-tillage systems and intensive cover cropping techniques, as well as programs to aid farmers in their transition to adopt these techniques, will serve to support even greater resilience in these systems through enhancing soil health.

Continuing to develop organic crop insurance options also supports the resilience of our organic farms in the face of uncertain weather. While decreasing risk at the production level is the first line of defense for farmers, crop insurance programs are critical to help farmers recover some portion of expected income in the event of a crop loss or failure, stabilize annual income, and reduce the stress of worrying about possible losses. However, a five-year, USDA-funded study reported continued challenges for organic farmers in obtaining insurance coverage, due to lack of knowledge about the programs, unavailability of coverage for certain crops, inadequate coverage of losses, and ineligibility due to adoption of certain conservation practices¹⁶. Addressing these challenges would benefit this critical tool to support the economic resilience of organic farms moving forward into the next decade.



Above: Organic reduced-till squash production using rolled cover crops (Photo credit: Erin Silva)

CONCLUSION

Organic agriculture in Wisconsin continues to flourish, proving resilient in the face of multiple challenges arising over the last several years. That resilience is a testament to the strength of the entire organic industry, including farmers, processors, certifiers and consumers. Organic production methods enhance diversity at the field, landscape, and market levels, building resilience on individual farms as well as the rural communities supporting them. With continued support and innovation, Wisconsin will continue to move forward as a global leader in the organic industry, expanding its presence in this growing market and creating beneficial strategies for producing food in a changing world.

¹⁶ Morris, M. E. Belesco, and J. Schahczenski. 2019. *Is organic farming risky? Improving crop insurance for organic farms.* <https://attra.ncat.org/product/is-organic-farming-risky/>



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APPENDIX B: ACTIVE UW-MADISON ORGANIC RESEARCH

CURRENT ORGANIC RESEARCH, EDUCATION, AND OUTREACH AT THE UNIVERSITY OF WISCONSIN-MADISON COLLEGE OF AGRICULTURAL AND LIFE SCIENCES

Note: This list only details active organic research currently underway at UW-Madison. It does not include past organic research. Full descriptions of these projects, as well as past organic research projects, can be found in the current and past on-line versions of these reports: <https://www.cias.wisc.edu/category/organic-agriculture/>

SOIL HEALTH AND CROP PRODUCTION

Building Resilience to Extreme Rainfall Events: Cover Crop-Based Reduced Tillage Strategies for Diversified Organic Vegetable Farms

Researchers: Rue Genger (Department of Horticulture); Claire Strader (Division of Extension and FairShare CSA Coalition); Julie Dawson (Department of Horticulture)

Innovations in Cover Crop-Based Organic No-Till Systems to Improve Soil Health and Nutrient Management

Researchers: Brian Luck (Department of Biological Systems Engineering); Erin Silva (Department of Plant Pathology); Matthew Ruark (Department of Soil Science); Jessica Drewry (Department of Biological Systems Engineering)

Unraveling the Soil Microbiome: Integrating Crop Production, Soil Management, and Metagenomics to Bring Science to Practice

Researchers: Erin Silva (Department of Plant Pathology); Matthew Ruark (Department of Soil Science); Richard Lankau (Department of Plant Pathology); Teal Potter (Department of Plant Pathology); Miranda Sikora (Agroecology)

Cover Crop Research and Outreach Project (CCROP)

Researchers: Faculty, staff, and scientists from UW-Madison, the USDA Dairy Forage Research Center, and the Michael Fields Agricultural Institute

Taking Tillage Out of Organic Grain Crop Production with Ecology, Tools, and Technology

Researcher: Erin Silva (Department of Plant Pathology)

Determining the Benefits of Cover Crops and Cover Crop Mixtures on Organic Grain Farms

Researcher: Matt Ruark (Department of Soil Science)

Partnering to Enhance the Sustainability of Indigenous White Corn Production

Researchers: Erin Silva (Department of Plant Pathology); Richard Lankau (Department of Plant Pathology); Daniel Hayden (Department of Plant Pathology); Lea Zeise (Agriculture Program Manager - United South and Eastern Tribes Inc); Dan Cornelius (Inter-tribal Agricultural Council)

Organic Alternatives to Conventional Celery Powder as a Meat Curing Agent

Researchers: Erin Silva (Department of Plant Pathology); Jeff Sindelar (Department of Animal Sciences); Paul Mitchell (Department of Agricultural and Applied Economics); Owen Washam (Department of Plant Pathology)

Ecological Intensification at the Wisconsin Integrated Cropping Systems Trial (WICST)

Researchers: Gregg Sanford (Department of Agronomy); Randy Jackson (Department of Agronomy); Clarissa Dietz (Agroecology)

Soil System Partnerships in Direct Market Agriculture

Researchers: Alfonso Morales (Department of Planning and Landscape Architecture); Randy Jackson (Department of Agronomy)

Ecosystem Partnerships in Direct Market Agriculture

Researchers: Alfonso Morales (Department of Planning and Landscape Architecture); Randy Jackson (Department of Agronomy)

BREEDING FOR ORGANIC AGRICULTURE

Seed to Kitchen Collaborative Participatory Vegetable Variety Evaluation and Selection for High-Quality Organic Produce in the Upper Midwest

Researchers: Julie Dawson (Department of Horticulture); William Tracy (Department of Agronomy); Rue Genger (Department of Horticulture); Irwin Goldman (Department of Horticulture); Philipp Simon (USDA-ARS and Department of Horticulture); Yiquen Weng (USDA-ARS and Department of Horticulture); Jim Nienhuis (Department of Horticulture); Ken Kmiecik (Independent Plant Breeder)

Collaborative Plant Breeding Network Development for Organic Systems in the Upper Midwest
Researchers: Julie Dawson (Department of Horticulture); Micaela Colley (Organic Seed Alliance); Nicolas Enjalbert (Seedlinked); Alice Formiga (eOrganic)

Tomato Organic Management and Improvement (TOMI) II
Researcher: Julie Dawson (Department of Horticulture)

Collaborative Plant Breeding for Organic Tomatoes in the Upper Midwest
Researcher: Julie Dawson (Department of Horticulture)

Improving the Effectiveness of Participatory Vegetable Trials for Wisconsin Organic Growers
Researchers: Rue Genger (Department of Horticulture); Julie Dawson (Department of Horticulture)

Selecting Improved Potato Varieties for Wisconsin Organic Growers and Markets
Researchers: Rue Genger (Department of Horticulture); Julie Dawson (Department of Horticulture)

Northern Organic Vegetable Improvement Collaborative
Researchers: Julie Dawson (Department of Horticulture); William Tracy (Department of Agronomy)

Improving Farmer Options for Sustainable and Profitable Direct-Market Tomato Production and High Tunnel Management in the Upper Midwest
Researcher: Julie Dawson (Department of Horticulture)

Strategies to Identify and Introgress Production and Quality Traits from Genetic Resources to Elite Carrot Cultivars for the U.S. and Global Market
Researchers: Julie Dawson (Department of Horticulture); Philipp Simon (USDA-ARS and Department of Horticulture); Irwin Goldman (Department of Horticulture); David Spooner (USDA-ARS and Department of Horticulture)

Selecting Improved and Heirloom Potato Varieties for Wisconsin Organic Producers
Researchers: Rue Genger (Department of Horticulture); Julie Dawson (Department of Horticulture)

Accelerating Corn Elite Selections (ACES) Organic Breeding Program: Novel Strategies to Develop Field and Sweet Corn for Organic Producers
Researchers: William Tracy (Department of Agronomy); Cathleen McCluskey (Nelson Institute for Environmental Studies)

Breeding Improved Supersweet Corn for Organic Cropping Systems
Researcher: William Tracy (Department of Agronomy)

Chasing Dirt: Breeding Earthy and Mild Beets for Wisconsin Growers and Eaters
Researcher: Irwin Goldman (Department of Horticulture)

Consumer-Engaged Participatory Plant Breeding Model Comparison and Table Beet Flavor Breeding
Researcher: Irwin Goldman (Department of Horticulture)

Genetic and Cultural Control of Cercospora Leaf Blight and Bacterial Leaf Spot in Table Beet under Organic Conditions
Researcher: Irwin Goldman (Department of Horticulture); Liam Scully Dixon (Plant Breeding and Plant Genetics)

Improving the Effectiveness of Vegetable Variety Trials to Assist in Breeding Decisions and to Meet Fresh-Market Grower Needs
Researcher: Julie Dawson (Department of Horticulture)

Variety Trials to Support Local Food Systems and Food Security in the Upper Midwest
Researchers: Julie Dawson (Department of Horticulture); Erin Silva (Department of Plant Pathology); Kevin Schoessow (Madison Division of Extension)

CIOA: Carrot Improvement for Organic Agriculture
Researchers: Philipp Simon (USDA-ARS Department of Horticulture); Erin Silva (Department of Plant Pathology); Julie Dawson (Department of Horticulture); Zac Freedman (Department of Soil Science)

Strengthening Commercial Vegetable Production in Northern Wisconsin
Researchers: Julie Dawson (Department of Horticulture); Rue Genger (Department of Horticulture); Jason Fischbach (Division of Extension)

Oat Variety Trial Under Organic Management: Increasing Profitability for Organic Producers in the North Central Region
Researcher: Lucia Gutierrez (Department of Agronomy)

Developing Multi-Use Naked Barley for Organic Farming Systems
Researchers: Lucia Gutierrez (Department of Agronomy); Julie Dawson (Department of Horticulture); Christopher Massman (Plant Breeding and Plant Genetics)

Value-Added Grains for Local and Regional Food Systems

Researchers: Lucia Gutierrez (Department of Agronomy); Julie Dawson (Department of Horticulture); Pablo Sandro (Plant Breeding and Plant Genetics)

Developing High-Quality Cereals for Organic and Perennial Systems in the Upper Midwest

Researchers: Valentin Picasso Gutierrez (Department of Agronomy), Lucia Gutierrez (Department of Agronomy); Julie Dawson (Department of Horticulture); Pablo Sandro (Plant Breeding and Plant Genetics)

Evaluation of Advanced Organic Winter Wheat Breeding Lines for Agronomic and Quality Characteristics in Preparation for Release

Researchers: Julie Dawson (Department of Horticulture); Lucia Gutierrez (Department of Agronomy)

MARKETING AND ECONOMICS

Farm2Facts: Empowering Communities through Farmers Market Data (farm2facts.org)

Researcher: Alfonso Morales (Department of Planning and Landscape Architecture)

Farm2Facts: Metrics and Indicators for Impact - Hospitals and Clinics

Researchers: Alfonso Morales (Department of Planning and Landscape Architecture); Phil Warsaw (Michigan State University)

Retail Competition, Marketing, and Opportunities for Organic Food in the Upper Midwest

Researchers: Sheldon Du (Department of Agricultural and Applied Economics); Bradford Barham (Department of Agricultural and Applied Economics); Paul Mitchell (Department of Agricultural and Applied Economics); Andrew Stevens (Department of Agricultural and Applied Economics)

Improving Labor Management Decisions on Small and Medium-Sized Farms

Researchers: John Hendrickson (Center for Integrated Agricultural Systems)

Apples to Glass: Improving Orchard Profitability through Developing Regional Craft Ciders

Researchers: Michelle Miller (Center for Integrated Agricultural Systems); Regina Hirsch (Center for Integrated Agricultural Systems); Sarah Lloyd (Center for Integrated Agricultural Systems)

Filling the Truck: Increasing Transportation Efficiencies Along the Supply Chain

Researchers: Sarah Lloyd (Center for Integrated Agricultural Systems); Regina Hirsch (Center for Integrated Agricultural Systems); Michelle Miller (Center for Integrated Agricultural Systems)

U.S. Food Flows: A Cold-Chain Network Analysis of Freight Movements to Inform Local and Regional Food Issues

Researchers: Michelle Miller (Center for Integrated Agricultural Systems); Andrew Stevens (Department of Agricultural and Applied Economics); Steve Deller (Department of Agricultural and Applied Economics); Lindsey Day Farnsworth (Division of Extension); Ernest Perry (Department of Civil and Environmental Engineering)

Lessons from COVID-19: Positioning Regional Food Supply Chains for Future Pandemics, Natural Disasters and Human-made Crises

Researchers: Michelle Miller (Center for Integrated Agricultural Systems); Andrew Stevens (Department of Agricultural and Applied Economics); Lindsey Day Farnsworth (Division of Extension); James Teal (Department of Agricultural and Applied Economics); Catie Demets (Department of Planning and Landscape Architecture); James Hughes (Department of Planning and Landscape Architecture)

Dairy Supply Management Roundtable

Researchers: Michelle Miller (Center for Integrated Agricultural Systems); Sarah Lloyd (Center for Integrated Agricultural Systems); Mark Stephenson (Department of Agricultural and Applied Economics); Simon Jette-Nantel (Division of Extension); Trisha Wagner (Division of Extension); Brandon Forseth (Department of Community and Environmental Sociology)

PEST AND DISEASE MANAGEMENT

Integrated Pest Management in Organic Agriculture

Researchers: Russell Groves (Department of Entomology); Amanda Gevens (Department of Plant Pathology); Jed Colquhoun (Department of Horticulture); Erin Silva (Department of Plant Pathology)

Investigating Plant Induced and Biological Management Strategies for Late Blight Management in Wisconsin for Enhanced Organic Disease Control

Researchers: Erin Silva (Department of Plant Pathology);

Amanda Gevens (Department of Plant Pathology); Tina Wu (Department of Plant Pathology)

Evaluation of Organically Approved Fungicides for Vegetable Crops

Researcher: Amanda Gevens (Department of Plant Pathology)

Evaluation of Organically Approved Pesticides for Organic Vegetable Crops

Researcher: Russell Groves (Department of Entomology)

Practical Approach to Controlling Foliar Pathogens in Organic Tomato Production Through Participatory Breeding and Integrated Pest Management

Researcher: Julie Dawson (Department of Horticulture)

Lab to Farm: Integrating Organic Cucurbit Science and Production in the Midwest

Researcher: Erin Silva (Department of Plant Pathology); Dylan Bruce (Departments of Plant Pathology and Horticulture)

Identifying and Expanding Integrated Disease Management Resources to include Organic Grains in Support of Organic and Transitional North Central Region Farms

Researchers: Damon Smith (Department of Plant Pathology); Erin Silva (Department of Plant Pathology)

LIVESTOCK AND GRAZING

Grazing Management of Kernza Intermediate Wheatgrass as a Dual-Purpose Crop

Researcher: Valentin Picasso (Department of Agronomy)

Grassland 2.0-Agroecological Transformation to Perennial Grassland Agriculture

Researchers: Randy Jackson (Department of Agronomy); Claudio Gratton (Department of Entomology); Brad Barham (Department of Agricultural and Applied Economics); Chris Kucharik (Department of Agronomy); Adena Rissman (Department of Forest and Wildlife Ecology); Michael Bell (Department of Community and Environmental Sociology)

Rotational Grazing Management Effects on Soil Carbon

Researcher: Randy Jackson (Department of Agronomy); Ashley Becker (Nelson Institute for Environmental Studies)

Grazing Cover Crops

Researchers: Randy Jackson (Department of Agronomy); Heidi Peterson (Sand County Foundation); Carly Huggins (Agroecology)

Modeling Grazed Cover Crops with Agro-IBIS

Researchers: Randy Jackson (Department of Agronomy); Chris Kucharik (Department of Agronomy); Matt Ruark (Department of Soil Science); Claudio Gratton (Department of Entomology); Gregg Sanford (Department of Agronomy); Anna Orfanou (Department of Agronomy)

Environmental Impact of Organic Dairy Facilities Using Life Cycle Assessment Tools

Researchers: Rebecca Larson (Department of Biological Systems Engineering); Horacio Aguirre-Villegas (Department of Biological Systems Engineering); Michel Wattiaux (Department of Dairy Science); Erin Silva (Department of Plant Pathology)

Evaluation of Stockpiling Pastures to Extend the Fall Grazing Season

Researchers: Matt Akins (Department of Animal and Dairy Science); Michel Wattiaux (Department of Animal and Dairy Science); Erin Silva (Department of Plant Pathology); Tom Kriegl (Emeritus, Department of Agricultural and Applied Economics); Valentin Picasso (Department of Agronomy); Jason Cavidini (UW Marshfield Agricultural Research Station); Kate Wells (Department of Animal and Dairy Science)

FARMER TRAINING AND EXTENSION

OGRAIN: Organic Grain Resource and Information Network

Researchers: Erin Silva (Department of Plant Pathology); Julie Dawson (Department of Horticulture); Alyssa Hartman (Artisan Grain Collaborative)

Seed to Kitchen: Identifying Vegetable Varieties with Quality and Production Characteristics for Wisconsin Growers

Researcher: Julie Dawson (Department of Horticulture)

Seedlinked

Researchers: Julie Dawson (Department of Horticulture); Ruth Genger (Department of Horticulture)

Organic Vegetable Grower Apprenticeship

Researchers: Claire Strader (Division of Extension and FairShare CSA Coalition); Julie Dawson (Department of Horticulture)

OGRAIN Virtual Field Day Toolbox for Agriculture Service Providers

Researchers: Erin Silva (Department of Plant Pathology)

OGRAIN Compass

Researchers: Erin Silva (Department of Plant Pathology); John Hendrickson (Center for Integrated Agricultural Systems); Jim Munsch (Consultant and Beef Grazier)

Wisconsin School for Beginning Market Growers

Researcher: John Hendrickson (Center for Integrated Agricultural Systems)

Wisconsin School for Beginning Apple Growers

Researcher: John Hendrickson (Center for Integrated Agricultural Systems)

Wisconsin Cut Flower Growers School

Researcher: John Hendrickson (Center for Integrated Agricultural Systems)

Wisconsin School for Beginning Dairy and Livestock Farmers

Director: Nadia Alber (Center for Integrated Agricultural Systems)

K-12 EDUCATION

Student-Based, Farmer-Advised Sustainable Food Systems Curriculum: A Collaborative Approach for Developing and Assessing Agricultural Education in Elementary Schools

Researcher: Julie Dawson (Department of Horticulture)

Developing Multi-Use Naked Barley for Organic Farming Systems – Education component

Researchers: Lucia Gutierrez (Department of Agronomy); Julie Dawson (Department of Horticulture); Christopher Massman (Plant Breeding and Plant Genetics)

UNDERGRADUATE AND GRADUATE EDUCATION

Undergraduate Certificate in Organic Agriculture

Researchers: Erin Silva (Department of Plant Pathology); Brad Barham (Department of Agricultural and Applied Economics); Julie Dawson (Department of Horticulture); Alfonso Morales (Department of Planning and Landscape Architecture); Shawn Steffan (Department of Entomology); Bill Tracy (Department of Agronomy); Steve Ventura (Department of Soil Science); Tom Bryan (GreenHouse Learning Community); Katie Peterman (Department of Plant Pathology); Anders Gurda (Department of Plant Pathology)

Farming the City: Building a Competent and Diverse Workforce for Urban Agriculture

Researchers: Steve Ventura (Department of Soil Science) and Michael Bell (Department of Community and Environmental Sociology)

CIAS Graduate Student Summer Mini-grant program

Researcher: Jacob Grace (Center for Integrated Agricultural Systems)

INTERNATIONAL WORK

The LAND (Livelihood, Agroecology, Nutrition, and Development) Project

Researcher: Michael Bell (Department of Community and Environmental Sociology)

APPENDIX C: REFERENCES

COVID AND DIVERSIFIED VEGETABLE PRODUCTION

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- FairShare CSA Coalition, Annual Farmer Survey, November 2020. Unpublished data
- Colorado State University Food Systems Initiative. <https://foodsystems.colostate.edu/covid19/>
- How restaurants can thrive in the next normal. May 19, 2020. <https://www.mckinsey.com/industries/retail/our-insights/how-restaurants-can-thrive-in-the-next-normal>
- “Supply chains and COVID19”, National Academies of Science webinar April 8, 2020, based on remarks by Anne Strauss-Wieder, North Jersey Transportation Planning Authority
- COVID-19 and the Wisconsin Organic Meat Industry in 2020

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- Crescent Meats, <https://www.crescentqualitymeats.com/> Wayne Lautsbaugh, Cadott, WI 715-289-3000
- UW Meat Sciences Division <https://fyi.extension.wisc.edu/meats/> Jeff Sindelar, Madison, WI 608-262-0555
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