

APPENDIX B: ACTIVE UW-MADISON ORGANIC RESEARCH

The following information was gathered through a search of the USDA Current Research Information System and updates from researchers. This list may not include all organic research occurring at UW-Madison. If you know of other projects we should include, or if you have any questions about organic research at UW-Madison, please contact Erin Silva at 608-890-1503 or emsilva@wisc.edu.

Weed and Fertility Interactions in Organic Vegetable Crops

Researchers: A.J. Bussan (UW-Madison Department of Horticulture), 608-262-3519, ajbussan@wisc.edu; Matt Ruark (Department of Soil Science), Jed Colquhoun (Department of Horticulture) and Erin Silva (Department of Agronomy)

Description: The goal of this research is to develop effective weed management systems for large-scale organic production of sweet corn for processing. Specific objectives include optimization of weed and nutrient management in organic sweet corn and determination of weed interference and seed production under different organic management practices.

Strategies of pasture supplementation on organic and conventional grazing dairies: assessment of economic, production and environmental outcomes

Researchers: Victor Cabrera (UW-Madison Department of Dairy Science), 608-263-3308, vcabrera@wisc.edu; David Combs (UW-Madison Department of Dairy Science), Rhonda Gildersleeve (UW Lancaster Agricultural Research Station) and Michel Wattiaux (UW-Madison Department of Dairy Science)

Description: USDA National Organic Program (NOP) standards for dairy and livestock production require that 30 percent or more of dry matter intake is provided by pastures on organic farms during the grazing season. Managed pastures provide abundant, high quality forage, but also present challenges when balancing dairy rations. This project is designed to investigate the impacts of pasture supplementation decisions made by Wisconsin organic and conventional grazing dairy farmers on selected economic, production and environmental variables. Organic dairy producers, transitioning producers and even conventional producers will benefit from this project as it identifies the farm level factors that influence pasture supplementation decisions and feed resource management on dairy farms. Project results will be utilized to develop outreach materials and decision aids that will be useful to farmers, extension agents and other agricultural professionals as they assist organic, transitioning, beginning or grazing dairy producers with farm planning and risk management decisions.

Organic certified seed potato production in the Midwest

Researchers: Amy Charkowski (UW-Madison Department of Plant Pathology), 608-262-7911, amyc@plantpath.wisc.edu; Ruth Genger and Doug Rouse (UW-Madison Department of Plant Pathology), Russell Groves (UW-Madison Department of Entomology) and Shelley Jansky (UW-Madison Department of Horticulture)

Description: Use of certified, disease-free seed potatoes limits tuber-borne diseases in potato crops, improving yield and quality. Limited organic production of certified seed potatoes in the Midwest forces organic growers to import at least some of their planting stock from other regions and increases the risk of accidental introduction and spread of diseases. This project will support organic production of certified seed potatoes in the Midwest through field-based and economic research. Our research will provide growers with detailed agronomic, sensory and nutritional data on heirloom and specialty potato varieties that are likely to perform well under low-input, organic conditions and appeal to consumers. Heirloom potato varieties will be grown in on-farm trials and characterized for yield, quality, disease resistance, taste and nutritional quality. We will define best management practices for organic production of seed potatoes, testing strategies for control of aphid-transmitted viruses that are a major seed potato production problem. A microeconomic analysis will be conducted based on the results of on-farm trials, and will be complemented by a macroeconomic analysis of organic markets.

Crop plant nutrition and insect response in organic field crop production: linking farmer observation to university research and extension

Researchers: Eileen Cullen (UW-Madison Department of Entomology), 608-261-1507, cullen@entomology.wisc.edu; Kevin Shelley (UW-Madison Nutrient and Pest Management Program), Robin Mittenthal (UW-Madison Department of Entomology) and Paul Whitaker (UW-Marathon County)

Description: This project examines the link between crop plant nutrition and insect response, as well as the premise that organic soil fertility management plays a sizeable role in managing insect pests. The project has three components: 1) A long-term, controlled experiment at the UW-Madison Arlington Research Station comparing two methods of organic fertility management (soil balance with calcium additions, compared with a standard organic manure and legume source N-P-K sufficiency approach) in a four-crop rotation. The farmer-selected crop-insect associations examined include soybean-soybean aphid, alfalfa-potato leafhopper and corn-European corn borer; 2) Similar data collection on six established organic farms representing the two approaches to soil fertility management; 3) Undergraduate on-farm research partnerships with organic farmers and greenhouse experiment collaboration with UW-Marathon County.

Evaluation of organically approved fungicides for vegetable crops.

Researcher: Amanda Gevens (UW-Madison Vegetable Pathology), 608-890-3072, gevens@wisc.edu

This program evaluated the efficacy of OMRI and organic-approved fungicides for control of diseases in potato and vegetable crops in Wisconsin. Evaluation of materials is carried out both in production fields and in university greenhouses and laboratories. Results are extended to producers at various educational sessions throughout the year and via the Vegetable Crop Updates newsletter from UW-Madison.

Evaluation of organically approved pesticides for organic vegetable crops

Researchers: Russell Groves (UW-Madison Department of Entomology), 608-262-3229, groves@entomology.wisc.edu

Description: This program evaluates the efficacy of organically approved compounds against some of the more commonly found vegetable insect pests faced by Wisconsin's organic vegetable producers.

Fertility strategies for hoop house-grown organic raspberries

Researchers: Rebecca Harbut (UW-Madison Department of Horticulture), 608-262-6452, harbut@wisc.edu and Jesse Dahir-Kanehl (Department of Horticulture)

Description: This project investigates the breakdown of organic fertilizers such as compost, manure and emulsions used in the organic production of raspberries in a hoop house. The higher humidity, higher temperatures and drip irrigation characteristic of hoop house production have the potential to alter nutrient availability. This project incorporates a trans-disciplinary approach, addressing diverse topics such as high tunnel and greenhouse management, raspberry management, organic/sustainable agriculture, season extension, plant nutrition, soil microbiology and soil science.

On-farm research with organic graziers

Researchers: Janet Hedtcke (Department of Agronomy), 608-265-2948, jlrieste@facstaff.wisc.edu; Josh Posner (Department of Agronomy), Alfrid Krusenbaum (organic farmer), Ken Nordlund (UW-Madison School of Veterinary Medicine), Gary Frank (UW-Madison Center for Dairy Profitability) and Bob Van De Boom (organic farmer)

Description: Over the past two decades, research projects have been ongoing at the Krusen Grass farm in Elkhorn, Wisconsin, while it has transitioned from row crops to organic rotational grazing. Herd health, performance and productivity, farm financial and economic performance, and nutrient management have been monitored. More recently, heifers and steers are being weighed two to three times per year to evaluate weight gains with a custom grazer.

Organic and conventional production systems in the long-term Wisconsin Integrated Cropping Systems Trials: productivity, profitability and environmental impact

Researchers: Janet Hedtcke (UW-Madison Department of Agronomy), 608-265-2948, jlrieste@facstaff.wisc.edu; Josh

Posner (UW-Madison Department of Agronomy), Jon Baldock (AGSTAT), John Hall (Michael Fields Agricultural Institute), Dwight Mueller (UW-Madison Agricultural Research Station), Darwin Frye (UW-Madison Agricultural Research Station) and Jean-Paul Chavas (UW-Madison Department of Agricultural and Applied Economics)

Description: In 1989, in response to the debate about the relative agricultural sustainability of low-input and conventional systems, a large-scale, long-term study entitled the Wisconsin Integrated Cropping Systems Trials (WICST) was initiated at two locations in southern Wisconsin to compare the productivity, profitability and environmental impact of a range of conventional and organic cropping systems.

Reducing risk associated with organic snap bean production in Wisconsin

Researchers: James Nienhuis (UW-Madison Department of Horticulture), 608-262-6975, nienhuis@wisc.edu

Description: In Wisconsin, organic snap bean production for processing meets less than one-third of current demand. In spite of price incentives, it is difficult for processors to contract sufficient acres to meet demand due to the high risk and low yields associated with larger-scale organic production. The principle limiting factors to organic snap bean production include: 1) root rot disease, 2) nitrogen management, 3) seed corn maggot and 4) the availability of certified organic seed. The objective of this proposal is to integrate technologies, strategies and experience to determine optimal levels of genotype, fertilizer type, fertilizer rate, seed treatment and seed source to optimize benefits and reduce risk associated with organic snap bean production in Wisconsin.

Impact of organic management on dairy animal health and well-being

Researchers: Pamela Ruegg (UW-Madison Department of Dairy Science), 608-263-3495, plruegg@facstaff.wisc.edu; Linda Tikofsky & Ynte Schukken (Cornell University); Mike Gamroth (Oregon State University)

Description: The overall objectives of this project are to assess cow health and well-being on farms that use organic management systems and evaluate, develop and disseminate recommendations for cost-effective, preventative health management programs. Animal health and management data will be collected on 200 organic and 100 conventional dairy farms located in Wisconsin, New York and Oregon. Management factors that influence animal well-being and farm profitability will be identified. This data will be used to develop cost-effective, preventative, health management programs. Indicators of herd health and milk quality will be identified and used to create herd performance benchmarks that will be provided to participating farms.

Developing carbon-positive organic systems through reduced tillage and cover crop-intensive crop rotation schemes

Researchers: Erin Silva (UW-Madison Department of Agronomy), 608-890-1503, emsilva@wisc.edu (in collabora-

tion with Iowa State, University of Minnesota, Michigan State and North Dakota State)

Description: Of the issues faced by row crop producers, those resulting from soil erosion, compaction and fertility loss remain the most challenging. In an effort to address these soil quality issues, many producers have successfully adopted a system that limits the number of field operations required to produce a crop. This system is commonly referred to as no-till or reduced-till, and relies on pesticides and synthetic fertilizers that are not allowed in certified organic production. The goal of this project is to design and execute a no-till system that will allow organic row crop producers to forego a suite of tillage operations that may reduce soil quality and drive up the cost of production. Soil quality will be enhanced by maximizing soil cover, minimizing erosion and improving soil organisms and biological processes. Improvement in soil health will be measured by tracking nutrient cycling and biological processes, microbial populations and nitrogen mineralization rates. Enhanced ecosystem services on organic farms will be determined by measuring carbon sequestration, soil moisture and crop microclimates, weed suppression and biological controls through cover crop-intensive systems. Economic benefits will be measured by accounting for returns to organic farmers resulting from lower production costs through reduced tillage.

Northern organic vegetable improvement cooperative (NOVIC)

Researchers: Erin Silva (UW-Madison Department of Agronomy), 608-890-1503, emsilva@wisc.edu (in collaboration with North Dakota State University)

Description: A national, collaborative network of organic vegetable breeders will benefit the organic community by developing improved vegetable varieties that are adapted to organic systems. These varieties will combine disease resistance, nutritional and flavor quality, and contemporary productivity traits crucial to modern markets. We will focus on four hubs in the Northern U.S. and five crops: pea, broccoli, sweet corn, carrots and winter squash. Variety trials and evaluation of material at various stages of development will provide key information regarding adaptability. We will solicit input from growers regarding the suitability of the vegetables to their needs and guidance for further improvement toward cultivar development. Outreach activities will make the results of this work more accessible. Graduate student training and summer internships at each hub will be key aspects of the work. Workshops will be conducted and media will be developed to reinforce grower collaborations regarding the breeding, trialing and seed saving methods for each crop.

Determination of perceptions and use of organic seed and varieties by midwestern organic vegetable growers

Researchers: Erin Silva (UW-Madison Department of Agronomy), 608-890-1503, emsilva@wisc.edu and Alexandra Lyon (UW Nelson Institute for Environmental Studies)

Description: The overall goal of this project is to expand organic vegetable seed adoption and usage by increasing our understanding of grower needs and perceptions while also

exploring the potential of participatory plant breeding to improve vegetable varieties for organic production. We will investigate grower perceptions of organic seed, including 1) factors influencing their choices of vegetable varieties; 2) access to and quality of organic seed; 3) the influence of certifiers, seed companies and end markets on decisions about using organic seed; and 4) additional factors such as cost, impact on organic integrity, impact on consumer perceptions, etc. We will evaluate the potential of participatory plant breeding as a methodology for 1) advancing the quality and availability of organic seed; 2) developing productive relationships between organic farmers, university plant breeders and seed companies; and 3) empowering organic farmers to maintain and improve varieties for their own regional needs. We will develop a variety of media for a broad audience including growers, seed companies, regulators and academic peers.

Veggie Compass: which way will you grow?

Researchers: Erin Silva (UW-Madison Department of Agronomy), 608-890-1503, emsilva@wisc.edu; Paul Mitchell (UW-Madison Department of Agricultural and Applied Economics) and John Hendrickson (UW-Madison Center for Integrated Agricultural Systems)

Description: This project will create a farm business management tool specifically for diversified organic vegetable growers. Veggie Compass will improve the profitability of these growers by helping them better understand their own production costs, thus improving their decision making and whole-farm planning capabilities. We have created a strong outreach plan for the Midwest region through the development of ongoing, supportive communities of practice as well as grower workshops, presentations at organic farming conferences and webinars on the eOrganic website. This project will have strong economic and social benefits for organic farmers. Not only will this project assist growers in making effective business decisions to increase their efficiency and profitability, but also will assist farmers in effectively managing their labor.

Carrot improvement for organic agriculture with added grower and consumer value

Researchers: Philipp Simon (UW-Madison Department of Horticulture), 608-262-1248, philipp.simon@ars.usda.gov; Erin Silva and Jed Colquhoun (Department of Agronomy) (in collaboration with Organic Seed Alliance, University of California, Purdue University and Washington State University)

Description: The long-term goals of this project are to 1) develop and release carrot germplasm with improved disease and nematode resistance, marketable yield, nutritional value, flavor and storage quality for organic production, 2) improve our understanding of cultivar responses to organic production systems and identify desirable traits for organic producers, 3) inform growers about production and pest management schemes including cultivar selection to maximize carrot production, 4) inform consumers about the positive environmental impact of organic production systems and carrot nutritional quality and flavor and 5) train undergraduate and graduate students and postdocs in critical organic agriculture issues.