

Organic Research and Outreach in the North Central Region



**THE
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TRUST**

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Organic Research and Outreach in the North Central Region

Forward

Steady growth in the organic food and farming sector stimulated by enactment and implementation of the 1990 Organic Foods Production Act has been supported and encouraged by state and federal agencies and a growing number of state and national organizations and institutions.

Support has also been developed since 1990 within the land grant university system, which had been slow to embrace organic agriculture and provide support through its research, extension and education programs. This progress was documented for the first time in “State of the States: Organic Farming Research Systems at Land Grant Universities, 2000-2001,” a report by the Organic Farming Research Foundation.

At The Ceres Trust, when we began making organic research grants in the 12-state North Central Region, we were pleased to discover a surprisingly strong research component within the land grant university system. After we had made our first multi-year organic research grants in 2009, we compiled a list of organic researchers in the region. Our initial list of 250 scientists has since grown to more than 300, including graduate students making a commitment to organic research and teaching careers.

Since the OFRF “state of the states” report is now out of date, we decided to support preparation of a similar report documenting growth in organic research, extension and teaching in the 12-state region where our organic research grants are made. We also decided that this report should include state-specific details about student organic farms, certified organic research land and animals, sources of organic research funding, dissemination of organic research results through field days and peer-reviewed journals, organic education efforts of nonprofit organizations, and other relevant information.

We retained consultant Jim Riddle, former chair of the National Organic Standards Board and prominent leader in shaping and building the organic sector in this country and beyond, to produce this report. The vast amount of information he has gathered and organized has been reviewed by organic research leaders in each of the 12 land grant universities.

The report is being posted to the website of The Ceres Trust and we plan to provide support needed for annual updating. The Ceres Trust is pleased to offer our own regional “state of the states” report to the organic research and education community, to the organic farmers who provide inspiration and healthful food produced with environmentally-sound methods, and to the consumers who support organic food and farming and help make this progress possible.

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Acknowledgements

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Introduction

Organic agriculture research and outreach activities are taking root in the North Central Region. While some land grant universities' (LGU) organic programs are still in the early stages of development, others have well-developed, robust organic research and outreach programs. These may include organic undergraduate minors or certificate programs; graduate student opportunities; annual organic field days, workshops, and conferences; and certified organic crop and livestock research sites.

This report's purpose is to identify organic research and outreach activities at the twelve LGUs in the North Central Region¹ (NCR). It should be noted that other state universities, private colleges, community and tribal colleges, non-governmental organizations and institutions, state governments, and the USDA Agricultural Research Service are engaged in various organic research and outreach activities in the region. This report contains limited information on those activities, but does not purport to provide a comprehensive inventory of organic activities outside of the land grant system.

Organized alphabetically by state, the report has each state's chapter hyperlinked from the state's name in the "highlights" section of the Executive Summary. The report contains brief descriptions of recent and current organic research projects, peer-reviewed papers, and extension publications, dating back to 2002 when US National Organic Program (NOP) regulations took effect. In addition, the report lists key contact people and describes academic courses, degree programs, and hands-on learning opportunities, such as student organic farms. One can find active links² to university organic and sustainable agriculture websites and publications as well as the number of acres and animals used for organic research. An attached Appendix includes the primary author's observations and comments.

Finally, the report presents the titles of research projects funded by various United States Department of Agriculture (USDA) programs, including the National Institute for Food and Agriculture (NIFA), Organic Research and Extension Initiative (OREI), Organic Transitions, and Sustainable Agriculture Research and Education (SARE), as well as The Ceres Trust, the Organic Farming Research Foundation (OFRF), Organic Valley's Farmers Advocating for Organics (FAFO) fund, and internal university sources.

¹ The North Central Region includes Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin.

² If the link does not automatically open the desired page, try inserting the URL, which should appear when you hover your cursor over the linked word or phrase, into the address bar and hit "enter."

Executive Summary

This report finds more than 1475 acres of university land being used for organic research in the North Central Region (NCR), with all twelve land grant universities (LGUs) having some organic research land. Only one institution, the University of Minnesota, has a certified organic dairy herd, although The Ohio State University, University of Missouri, and Michigan State University are now conducting organic livestock research at university sites and others are doing on-farm organic livestock research.

Six universities in the NCR offer organic, sustainable, or agroecology minors or concentrations to undergraduates. None yet offer full organic undergraduate majors, although such a degree is being developed in Minnesota. Three institutions offer organic certificate programs. All twelve universities in the NCR offer graduate student organic research opportunities; eight have student farms using organic methods, with the student farms at Michigan State University and University of Minnesota being certified organic and the University of Illinois student farm in transition.

Specific highlights³ of this report include:

Illinois –The University of Illinois has conducted quite a bit of research on soil fertility in organic systems, and partners with the Illinois Specialty Growers Association to organize the annual Illinois Specialty Crops, Agritourism, and Organic Conference (ISCAOC). Chicago is home to innovative urban agriculture programs. Western Illinois University has a well-established program for organic research and outreach.

Indiana – In recent years, Purdue University has expanded organic research and outreach activities, as well as the number of faculty engaged in organic research. Purdue has recently released new Extension publications; hosts a student farm using organic methods; and conducts organic research at three locations.

Iowa – Iowa State University operates a well-established, robust, multi-disciplinary organic research program with organic research at four ISU locations; maintains an extensive inventory of organic research reports and refereed publications; and offers numerous academic and producer outreach opportunities, including the annual Iowa Organic Agriculture conference, field days, and excellent web resources.

Kansas – As of 2012, there has been a recent upswing in organic research activities at Kansas State University, led by the Kansas Center for Sustainable Agriculture and

³ To read the chapter report for each state, click on the name of the state at the beginning of that state's paragraph in the Executive Summary.

Alternative Crops. The Center also provides web access to various resources related to organic production.

Michigan – Michigan State University is a leading institution for organic research, education, training, outreach, and information exchange in a wide variety of disciplines. The annual Michigan Organic Reporting Sessions are innovative, interactive daylong events where researchers share progress and results with other researchers, producers, ag professionals and the general public. MSU offers an extensive collection of web resources. MSU’s Student Organic Farm is a 10-acre, certified organic year-round teaching and production farm. MSU has now added to their crop research by examining the use of hogs in organic apple production.

Minnesota – The University of Minnesota leads an extensive multi-disciplinary organic research program, involving faculty from agronomy, horticulture, economics, entomology, animal science, veterinary medicine, and food science. The UMN hosts annual organic crop and dairy field days; offers academic degrees; and provides a wide variety of Extension publications, refereed articles, and web resources. The UMN Library has established an innovative database where published organic research papers are archived, described and linked. With 827.94 acres used for organic research and a 100-cow certified organic dairy herd, the UMN has made a major institutional commitment to organic research, education and outreach.

Missouri - The University of Missouri has not historically been a leader in organic farming research, but an effort is currently underway to change that, with the launch of several new research projects. In recent years, MU has conducted numerous outreach events focused on organic production.

Nebraska - Organic crop research is being conducted on certified organic land in three of Nebraska’s four eco-regions. Unique areas of inquiry at the University of Nebraska-Lincoln include: biodiversity conservation on working organic farms; organic management impacts on breeding bird populations; and flame weeding. The UNL has developed a *Healthy Farm Index* for long-term, ecological monitoring of biodiversity indicators and land use patterns. UNL faculty and staff are actively engaged with organic producers and organizations throughout Nebraska.

North Dakota – The overall theme for organic research at North Dakota State University is “The Search for Agricultural Sustainability in the Northern Great Plains.” Quite a bit of research has focused on methods to reduce tillage intensity and terminate cover crops in organic systems, as well as plant breeding and variety selection. NDSU has hosted two organic field days in recent years, as well as integrating organic content in other outreach events.

Ohio - The Ohio State University’s College of Food, Agriculture, and Environmental Sciences employs more than forty faculty members who are involved in organic research, education, and extension activities, including many who are directly involved in the Organic Food and Farming Education Research (OFFER)

program. Areas of organic research include: agronomy; horticulture; soils; food processing; marketing and economics; and livestock (sheep, poultry, and dairy). Ohioline, which is the main outlet for Extension materials in Ohio, lists numerous publications for organic farmers; OSU faculty and staff are actively engaged with organic producers through field days and conferences.

South Dakota – South Dakota State University received certification for a 4-acre organic research plot in 2012, where trials on winter wheat varieties are conducted, with plans for flame weeding trials. SDSU faculty has worked with the Flandreau Santee Sioux tribe on development of a sustainable organic tribal bison production system. SDSU has a summer field day focusing on organic production and hosts an annual conference for organic producers.

Wisconsin – Wisconsin is home to robust, multi-disciplinary organic research, education, and outreach, led by faculty from the University of Wisconsin-Madison campus. Quite a bit of organic programming is also occurring at UW campuses throughout the state, as well as at several community and technical colleges. Faculty and staff, including those affiliated with the UW Center for Integrated Agriculture Systems (CIAS), work closely with organic producers and producer groups, such as Growing Power, Organic Valley, Midwest Organic and Sustainable Education Service (MOSES), and the Michael Fields Agricultural Institute, to conduct on-farm research and deliver field days and other outreach activities. The UW has an extensive list of peer-reviewed articles, Extension publications, and web resources.

Organic Research and Outreach in the North Central Region

Illinois

Organic Research Projects

Farmer-to-farmer advanced training project, Spaulding, T. R. (Angelic Organics Learning Center, Caledonia, IL), 2012-2105, Funding: USDA-NIFA.

Alleviating Soil Compaction and Improving Weed Suppression with Multifunctional Cover Crops in Organic Grain Production Systems, Maria Villamil, 2010-2013, Funding: The Ceres Trust.

Organic systems and climate change, Wander, M. M.; Ugarte, C.; Zaborski, E.; Phillips, E., 2010-2013, Funding: USDA-NIFA.

Systems Strategies for Weed Management on Organic Grain Farms. Joel Gruver, Western Illinois University, 2010-2012, Funding: The Ceres Trust.

Translating Sustainable Agriculture to the Backyard Garden in Metropolitan Chicago, Anya Maziak, Chicago Botanic Garden, 2010, Funding: SARE.

[Roller-Crimper Construction and No-Till Organic Weed Control Trials](#), Jackie de Batista, Irish Grove Farms, Inc., 2008, Funding: SARE.

[Developing an Effective Strategy for Management of Internal Discoloration of Horseradish Root](#), Mohammad Babadoost Kondri, U of IL, 2007, Funding: SARE.

[Establishment of an Organic, Sustainable Small-Scale Farm Producing Livestock \(Goats/Chickens\) and Vegetables for Niche Markets in Chicago](#), Godwin Akpan, 2007, Funding: SARE.

[Marketing of Small Amounts of Organic Grains through Alternative Broiler Feeds and Direct to Consumer Sales](#), Lisa Haynes, 2007, Funding: SARE.

Sustainability of organic systems in Illinois – [Windsor Organic Research Trials](#). Jarrell, W. M. 2003-2007, Funding: USDA-NIFA.

Cropping intensity and organic amendments in transitional farming systems, Shin-Yi Marzano, 2006, Funding: SARE.

Producing agro-food quality conventions through organic certification disputes in Illinois, Salo, K., UIL, 2005-2006, Funding: USDA-NIFA.

[Conducting a Variety Trial to Find the Best Marketable Organic Tomato Product](#), Louis Reuschel, Ocean Farm, 2004, Funding: SARE.

[Determination of an Economically Optimal Organic Control of Onion Maggots in Allium Crops](#), Lisa Haynes, 2004, Funding: SARE.

[Okra Test Trial of 16 Varieties in an Organic Farming Operation](#), Jon Klingenberg, Manning Farm Inc, 2003, Funding: SARE.

[New Strategies for Management of Vegetable Diseases in Organic and Traditional Farms](#), M. Babadoost, 2003, Funding: SARE.

Western Illinois University conducts a wide range of organic research, with reports on organic fertilizers; variety trials; planting dates; cover crops; weeds; tillage; and soils posted at: <http://www.wiu.edu/cbt/agriculture/farms/organic/research.php>

Refereed Publications

Wortman, S. E., C. A. Francis, M. A. Bernards, E. E. Blankenship, and J. L. Lindquist. 2012. Mechanical Termination of Diverse Cover Crop Mixtures for Improved Weed Suppression in Organic Cropping Systems. *Weed Science*. In Press.

Wortman, S. E., C. A. Francis, M. Bernards, R. Drijber, and J. L. Lindquist. 2012. Optimizing Cover Crop Benefits with Diverse Mixtures and an Alternative Termination Method. *Agronomy Journal* 104:1425-1435.

Wortman, S. E., C. A. Francis, and J. L. Lindquist. 2012. Cover Crop Mixtures for the Western Corn Belt: Opportunities for Increased Productivity and Stability. *Agronomy Journal* 104:699-705.

Wortman, S. E., T. Galusha, S. C. Mason, and C. A. Francis. 2012. Soil Fertility and Crop Yields in Long-Term Organic and Conventional Cropping Systems in Eastern Nebraska. *Renewable Agriculture and Food Systems* 27:200-216.

Wortman, S. E., J. L. Lindquist, M. Haar, and C. A. Francis. 2010. Increased Weed Diversity, Density and Aboveground Biomass in Long-Term Organic Crop Rotations. *Renewable Agriculture and Food Systems* 25:281-295.

Bicksler, A. J. and J. B. Masiunas. 2009. Canada thistle (*Cirsium arvense*) suppression with buckwheat or sudangrass and mowing. *Weed Technology* 23:556-563.

Wander M.M., Yun W., Goldstein W.A., Aref, S., and S.A. Khan. 2007. Organic N and particulate organic matter fractions in organic and conventional farming systems with a history of manure application. *Plant and Soil*. 291:311-321

Marriott, M.E. and M.M. Wander. 2006. Total and labile soil organic matter in organic farming systems. *Soil Science Society of America Journal*. 70:950-959.

Marriott, M.E. and M.M. Wander. 2006. Using qualitative and quantitative differences in particulate organic matter to assess fertility in organic and conventional farming systems. *Soil Biology and Biochemistry*. 38:1527-1536.

Extension and Outreach Publications

Michelle Wander from the University of Illinois has written numerous Extension publications on [soil management in organic systems](#), posted at: http://www.extension.org/organic_production

Examples include:

[Managing Manure Fertilizers in Organic Systems](#)

[Measures of Soil Biology and Biological Activity](#)

[NRCS EQIP: What You Need to Know About the Organic Initiative](#)

[Nutrient Budget Basics for Organic Farming Systems](#)

[Nutrient Management Plans and Fit with Organic Systems Plan](#)

[Organic Certification and Soil Conservation Compliance](#)

[Organic Potting Mix Basics](#)

[Organic Soil Fertility](#)

[Soil Fertility in Organic Farming Systems: Much More than Plant Nutrition](#)

[Use of Tillage in Organic Farming Systems: The Basics](#)

Academic Curricula

The University of Illinois has no classes dedicated to organic agriculture but does offer an "Agroecology" concentration within the Crop Sciences major and a "Specialty Crops" concentration in Horticulture in which many students interested in organic agriculture participate. These concentrations often include some of the following classes: Principles of Agroecology, Conservation Biology, Soil Nutrient Cycling, Multifunctional Landscapes, Vegetable Gardening, and Local Food Networks. There are no organic degrees or certificates.

Graduate Student Opportunities

Graduate student research opportunities are mostly driven by faculty research interests. U of IL faculty have trained, are currently training, or are planning to train graduate students in areas of organic agriculture.

Outreach Efforts

The University of Illinois partners with the Illinois Specialty Growers Association to organize the annual [Illinois Specialty Crops, Agritourism, and Organic Conference \(ISCAOC\)](#), which includes sessions on organic production.

The U of IL Department of Crop Sciences organizes an [Organic Gardening Day](#).

Western Illinois University holds an annual [organic field day](#) at the Allison Organic Farm.

Web Resources

The following websites contain information about organic and sustainable agriculture in Illinois:

U of IL Agroecology and Sustainable Agriculture Program -

<http://agroecologyandsustainableagriculture.org/>

U of IL Extension Small Farms Program -

<http://web.extension.illinois.edu/smallfarm/organic.html>

U of IL Library Sustainability/Organic Agriculture Resources -

<http://www.library.illinois.edu/funkaces/links/linkslst.php?Parent=717&Category=7>

[FamilyFarmed.org](#)

[Growing Home](#)

[Illinois Natural History Survey](#)

Illinois Organic Growers Association - <http://illinoisorganicgrowers.org/>

[Illinois Stewardship Alliance](#)

[The Land Connection](#)

[Wander Soil Ecology Lab](#)

Hands-on Learning

The Illinois Sustainable Student Farm is in the first year (2012) of transition to certified organic production on at least half of the six acres.

<http://thefarm.illinois.edu/>

In Chicago, [Windy City Harvest](#) trains adults in sustainable horticulture and urban agriculture. The certificate program is delivered by the Chicago Botanic Garden in partnership with Richard J. Daley College, a City College of Chicago.

[Growing Home](#) operates several certified organic training farms in and around Chicago, where interns receive a fair wage while learning transferable job skills in Landscaping/Horticulture, Food Service, or Customer Service.

Acres Certified Organic

In spring of 2013, the University of Illinois will begin transitioning ten acres on the campus research farm to long-term certified organic production, in addition to three acres at the [Illinois Sustainable Student Farm](#).

Faculty from Western Illinois University conduct organic crop research on 80 acres of land at the [Allison Organic Research & Demonstration Farm](#).

Total acres certified, managed organically, or in transition at Illinois research institutions = 93

Organic Livestock Research

None.

Key Contacts

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Indiana

Organic Research Projects

Collaborative Research to Identify Fertility Amendments that Improve Soil Quality and Mediate Pathogen Outbreaks on Organic Vegetable Farms, Lori Hoagland,

2012-2015, Funding: The Ceres Trust.

Organic Heirloom Tomato Variety Trial, Maria Restrepo, Extension; Shubin K. Saha, Horticulture & Landscape Architecture; Scott Monroe, Extension; Valerie Clingerman, Extension; Dan Egel, Botany & Plant Pathology, 2012, Funding: Internal.

Can ground beetles limit weeds in organic vegetable systems? Carmen Blubaugh, (Ian Kaplan, Major Professor), 2012, Funding: Ceres Trust Graduate Student Grant.

OMRI Certified Products for Fusarium Wilt in Watermelon, Dan Egel & Shubin K. Saha w/Nathan Kleczewski, Horticulture & Landscape Architecture, 2012, Funding: Indiana State Department of Agriculture Market Promotion and Distribution Grant Program.

Comparing the Effects of Spring and Fall Tillage on Larval Populations of a Beneficial Insect, Carmen Blubaugh, 2012, Funding: SARE.

Economics, ecology, education: An integrated approach to ensure the success of organic vegetable growers, Gibson, K., Alexander, C., Beckerman, J., Hallett, S., Hoagland, L., Kaplan, I., Kladvko, E., Marshall, M., Sadof, C., 2010, Funding: USDA-Organic Research and Extension Initiative.

Evaluation of OMRI-approved Products for Disease Management of Muskmelon, Daniel S. Egel, Shubin K. Saha, Stacye Johnson, Scott Monroe, Dennis Nowaskie, and Maria Restrepo, 2010, Funding: Indiana State Department of Agriculture Market Promotion and Distribution Grant Program.

Scaling Up Production by Improving Worker Comfort and Efficiency in No-till Organic Seed Garlic Production System, Daniel Perkins, Perkins' Good Earth Farm, 2010, Funding: SARE.

Cropping Systems for Tomato and Squash - Evaluating conventional tillage with plastic or straw mulch and strip-tillage with living mulch for producing squash and tomatoes in organic and conventional systems, 2006-2009, Liz Maynard, Funding: Internal.

Demonstration trials of food grains ozonation -- a new chemical-free stored product pest control technology, [Maier, D. E.](#), [Woloshuk, C. P.](#), [Mason, L. J.](#), [Alexander, C. E.](#), [Hulasare, R.](#), and [Subramanyam, B.](#), 2005-2008, Funding: USDA-NIFA.

[Evaluating weed control strategies in organic vegetable production](#), Dale Rhoads, 2008, funding: SARE.

[Enhancing Year-Round Sales of Quality Farm Product through the Use of On-Farm Geothermal Climate Controlled Storage Facilities](#), Anna Welch, 2007, Funding: SARE.

[Marketing an Organic CSA](#), Michael Hollcraft, 2007, Funding: SARE.

[Field Trials of Organic Herbicides in Vegetable Production](#), Dale Rhoads, 2006, Funding: SARE.

[Value-added Sustainable Animal Production with Natural and Organic Leathers](#), Brent Ladd, 2006, Funding: SARE.

[Development of Organic Weed Control Strategies](#), Dale Rhoads, 2005, Funding: SARE.

[Using farmer input to develop research projects and outreach activities for organic agriculture](#), David Hillger, 2005, Funding: SARE.

Weed Control in Organic Lettuce. 2004-2005. Liz Maynard. Funding: Internal and Gifts.

Organic production systems for apples in the Midwest, Foster, R. E.; Pecknold, P. C.; Hirst, P.; Weller, S. C., 2002-2005, Funding: USDA.

[Benefits & Evaluation of the Application of Compost Tea in Growing Organic Vegetables](#), Dan Flotow, 2004, Funding: SARE.

Specialty Tomato Variety Evaluation. 2001-2002. Dale Rhoads, Rhoads Farm, and Liz Maynard. Funding: Indiana Office of the Commissioner of Agriculture, Value-Added Grants Program.

Refereed Publications

Borrelli, K., Koenig, R., Gallagher, R., Pittman, D., Snyder, A., Fuerst, P., Hoagland, L. A. (in press). Alternative strategies for transitioning to organic production in direct-seeded grain systems in eastern Washington II: Soil Fertility. *Journal of Sustainable Agriculture*.

Hoagland, L., Mazzola, M., Murphy, K.M., Jones, S.S., 2012. Wheat varietal selection and annual vs. perennial growth habit impact soil microbial community and apple replant disease suppression. *Organic Seed Alliance Conference Proceedings*, Port Townsend, WA. pp. 13-15.

Veldstra, M. D., Alexander, C. E., & Marshall, M. I. 2012. To certify or not to certify? Decomposing the organic production and certification decisions. *Proceedings of the International Food and Agribusiness Management Association 2012 Annual World Symposium*. Shanghai, China. Available online: https://www.ifama.org/events/conferences/2012/cmsdocs/Symposium/PDF%20Symposium%20Papers/538_Paper.pdf.

Yue, C., Dennis, J. H., Behe, B. K., Hall, C. R., Campbell, B. L., & Lopez, R. G. 2011. Investigating consumer preference for organic, local, or sustainable plants. *HortScience*, 46(4), 610-615.

Turner, S. F., Benedict, C. A., Darby, H., Hoagland, L. A., Simonson, P., Serrine, J. R., & Murphy, K. M. 2011. Challenges and opportunities for organic hop production in the United States. *Agronomy Journal*, 103(6), 1645-1654.

Murphy, K. M., Hoagland, L. A., Yan, L., Colley, M., & Jones, S. 2011. Genotype X environmental interaction for mineral nutrient concentration in organically grown spring wheat. *Agronomy Journal*, 103, 1734-1741.

Mayen, C. D., Balagtas, J. V., & Alexander, C. E. 2010. Technology adoption and technical efficiency: organic and conventional dairy farms in the United States. *American Journal of Agricultural Economics*, 92(1), 181-195.

TerAvest, D., Smith, J. L., Carpenter-Boggs, L., Hoagland, L. A., Granatstein, D., & Reganold, J. 2010. Influence of orchard floor management and compost application timing on N partitioning in organically managed apple trees. *HortScience*, 45, 637-642.

Hoagland, L. A., Hodges, L., Brandle, J. R., Helmers, G. A., & Francis, C. A. 2010. Labor availability in an integrated agricultural system. *Journal of Sustainable Agriculture*, 34, 532-548.

Gallagher, R. S., Pittman, D., Snyder, A. M., Koenig, R. T., Fuerst, E. P., Burke, I. C., & Hoagland, L. A. 2010. Alternative strategies for the transition to organic production in direct-seeded grain systems in eastern WA I: Crop agronomy. *Journal of Sustainable Agriculture*, 34, 483-503.

Hoagland, L. A., Carpenter-Boggs, L., Granatstein, D., Mazzola, M., Peryea, F., Smith, J., & Reganold, J. 2008. Orchard floor management effects on nitrogen fertility and soil biological activity in a newly established organic apple orchard. *Biology and Fertility of Soils*, 45, 11-18.

David E. Hillger, Stephen C. Weller, Elizabeth Maynard, and Kevin D. Gibson 2006. Weed management systems in Indiana tomato production. *Weed Science*: May 2006, Vol. 54, No. 3, pp. 516-520.

Extension and Outreach Publications

[Disease Management Strategies for Horticultural Crops: Using Organic Fungicides](#)

[Driftwatch: Watch Out for Pesticide Drift and Organic Production](#)

[Fertigation in Organic Vegetable Production Systems](#) (eXtension.org)

[Organic Foods \(Food Entrepreneurship Series\)](#)

[Organic Vegetable Production](#) (short handout)

[Organic Vegetable Production](#) (20-page pub)

[Pesticide Residues in Urban Water Bodies - Organic Farming as a Community Based Mitigation Strategy in Hyderabad Peri-Urban Area](#)
[Organic Farming Fact Sheets](#)

Academic Curricula

No undergraduate organic or sustainable agriculture degree is available, but Purdue offers a class, “Principles of Organic Sustainable Agriculture.” (BTNY39000/HORT49100)

Graduate Student Opportunities

See description of graduate programs in various departments. Nothing is labeled organic but opportunities exist. For example, Purdue offers an Interdisciplinary Graduate Program in [Ecological Sciences and Engineering](#).

Outreach Efforts

[Indiana Horticultural Congress](#) – Purdue helps with annual organic sessions.
[New Ag Network](#) (2004-2011 Partnership with Michigan State, Illinois, and Purdue, supported by an organic grower advisory board) <http://www.new-ag.msu.edu/>

Midwest Organic Conference, co-hosted with the UIL, 2008 and 2009.

Organic Farming Workshops and Tours, 2005-2007. Classroom programs broadcast live over internet video and farm tours for Extension staff, ag professionals, and farmers.

Web Resources

North Central Regional Sustainable Ag and Organic Video Series:
tristateorganic.info

Organic Vegetable Production resource page:
<https://ag.purdue.edu/hla/fruitveg/Pages/OrganicVegProd.aspx>

See Extension and Outreach Publications listed above, all of which are on the web.

Hands-on Learning

Purdue Student Farm (managed using organic practices, but not certified)
<http://www3.ag.purdue.edu/programs/studentfarm/Pages/default.aspx>

The University of Notre Dame’s [campus garden](#) started in May 2010. Garden plots are 5’ X 10’ and their use is free of charge for individuals, families, groups of co-workers, or departments. Gardeners are free to do as they wish with the food they harvest. All gardeners agree to raise their crops organically.

Acres Certified Organic

[Southwest Purdue Ag Center](#) - 1 acre certified

[Pinney Purdue Ag Center](#) - 0.4 acre managed organically but not certified (0.2 managed organically since 1993); 0.1 acre in transition for use in high tunnel production

[Meigs/Throckmorton](#) - 10 acres certified, 8 acres managed organically not certified

Total acres certified, managed organically, or in transition = 19.5

Organic Livestock Research

None.

Key Contacts

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Dr. Liz Maynard, Extension Horticulture Specialist, emaynard@purdue.edu

Iowa

Organic Research Projects

ISU research projects:

Improving Organic No-Till Systems for Enhanced Soil Quality and Weed Management in Organic Vegetable and Grain/Forage Systems, Kathleen Delate, 2012-2015, Funding: The Ceres Trust.

Long-Term Agroecological Research (LTAR): Comparison of Organic and Conventional Crops and Crop Rotations: 17-acre certified organic experiment at the ISU Neely-Kinyon Farm, Greenfield, IA; Ongoing, Funding: Leopold Center for Sustainable Agriculture.

Management of New and Invasive Pests in Organic Soybeans: organic-compliant treatments for soybean aphid and bean leaf beetle management (Greenfield), 2009-2010, Funding: Leopold Center for Sustainable Agriculture.

Agronomic and Economic Performance of Organic Corn and Soybean Crops for Value-Added Traits: organic seed variety trials (Greenfield and Crawfordsville). Funding: Leopold Center for Sustainable Agriculture.

Organic Apple and Grape Performance under Iowa Conditions: organic-compliant treatments for codling moth and plum curculio in apples; weed and disease

management in grapes (Adel on-farm trial and Greenfield). Ongoing, Funding: Leopold Center for Sustainable Agriculture.

Sustainable Systems for Cucurbit Crops on Organic Farms, 2009-2012, Mark Gleason, Funding: OREI.

Integrated systems research and development in automation and sensors for sustainability of specialty crops, Steward, B. L.; Darr, M. J.; Tang, L., 2008-2013, Funding: USDA-NIFA.

Extramural research projects:

Enhancing Soil Health and Food Quality in Organic Vegetable Systems (Delate, Cambardella and Chase, and Univ. of Florida)-Greenfield, IA and Gainesville, FL, Funding: USDA-NIFA.

Developing Carbon-Positive Organic Systems through Reduced Tillage and Cover Crop-Intensive Crop Rotation Schemes (Delate, Cambardella and Chase, Ames, IA; 5 LGUs; and Rodale Institute), 2008-2102, Funding: USDA-CSREES.

Enhancing Farmland Water Quality and Availability through Soil-Building Crop Rotations and Organic Practices (Delate, Cambardella and Chase, and co-PIs at USDA-ARS NLAE, Ames, IA), Funding: USDA-CSREES.

Cover Crops for Organic Systems (Delate, Cambardella, Duffy, with NDSU), Greenfield, IA, Funding: USDA-SARE.

Facilitating improved soil quality on organic farms through research and training on no-till vegetable production in the Midwest, Kathleen Delate, 2009-2012, Funding: The Ceres Trust.

USDA-ARS (Ames, IA) Organic Research:

Strengthening public corn breeding to ensure that organic farmers have access to elite cultivars: Outreach, Abel C A; Carlson S., 2011-2014, Funding: USDA-ARS.

Breeding high-quality corn for low-input and organic farming systems, Pollak L M; Abel C A., 2008-2013, Funding: USDA-ARS.

Enhancing farmland water quality & availability through soil-building crop rotations & organic practices, Cambardella C A; Sauer T J; Jaynes D B; Delate K; Malone R W., 2009-2011, Funding: USDA-ARS.

Enhanced Midwestern cropping systems for sustainability and environmental quality, Singer J W; Kovar J L; Cambardella C A; Hatfield J L., 2008-2011, Funding: USDA-ARS.

Rainwater Harvesting for Irrigation of Organic Vegetables, Levi Lyle, LIFE- Levi's Indigenous Fruit Enterprises, 2012, Funding: SARE.

[Scaling Up to Meet Market Demand for Local, Organic Broccoli](#), Chris Blanchard, 2010, Funding: SARE.

Optimizing Row Covers and Perimeter Trap Crops for Cucurbit Pest Management, Jean Batzer, ISU, 2010, Funding: SARE.

Green Manure vs. Brown Manure in an Organic Vegetable System, Mark Quee, Scattergood Friends School, 2010, Funding: SARE.

[Project to Determine the Economic Viability of Black Soldier Fly Grubs as an Alternative Protein](#), Mari Holthaus, Kymar Acres, 2009, Funding: SARE.

[Extended-duration row covers to suppress bacterial wilt on muskmelon: optimizing a new management strategy for organic growers, Erika Saalau Rojas, ISU, 2009, Funding: SARE.](#)

Facilitating Change: Reducing the Risks of Transitioning to Organic through a Comprehensive Farmer-and Extension-Based Training Program, Kathleen Delate, ISU, 2008-2011, Funding: SARE.

[Grass-fed and Organic Beef: Production Cost and Profit Potential](#), Margaret Smith, ISU, 2007-2010, Funding: SARE.

Bilingual farmer training and mentorship program, Linda Barnes, Marshalltown Community College, Marshalltown, IA, 2008, Funding: OFRF.

Evaluation of strategies for management of soybean rust in organic systems, DeWitt, J., ISU, 2005-2008, Funding: USDA-NIFA.

[Agro-Forestry Project: Incorporating Grass-Hay Alley Cropping With Organic Nut Production](#), Raymond Hansen, Prairiewood Farm, 2006, Funding: SARE.

[Aronia Berry: A Sustainable Organic Crop](#), Vaughn Pittz, Sawmill Hollow Farm, 2005, Funding: SARE.

[Improving Soil Quality During and After Organic Transition](#), Kathleen Delate, ISU, 2005-2008, Funding: SARE.

[Growing Peas As a Protein Source for Organic Livestock](#), William Welsh, Welsh Family Organic Farm, 2004, Funding: SARE.

[Evaluating Alternative Pest Management Strategies for Organic Apple Production](#), Maury Wills, Wills Family Orchard, 2003, Funding: SARE.

Refereed Publications

Delate, K., C. Cambardella, C. Chase, A. Johanns, and R. Turnbull. 2012. The Long-Term Agroecological Research (LTAR) experiment supports organic yields, soil quality, and economic performance in Iowa. *Crop Management*. Accepted 9/13/12.

Delate, K., D. Cwach, and C. Chase. 2011. Organic no-till system effects on soybean, corn and irrigated tomato production and economic performance in Iowa, USA. *Renewable Agriculture and Food Systems* 27(1):49–59. doi: 10.1017/S1742170511000524.

Singerman, A., K. Delate, C. Chase, C. Greene, M. Livingston, S. Lence and C. Hart. 2011. Profitability of organic and conventional soybean production under ‘green payments’ in carbon offset programs. *Renewable Agriculture and Food Systems* doi:10/1017/S1742170511000408.

Wiltshire, K., K. Delate, M. Wiedenhoft, and J. Flora. 2010. Incorporating native plants into multifunctional prairie-pastures for organic cow-calf operations. *Renewable Ag. & Food Systems*. Published on-line 25 Sept. 2010: doi:10.1017/S174217051000044X.

Wiltshire, K., K. Delate, J. Flora, and M. Wiedenhoft. 2010. Sociocultural aspects of cow-calf persistence in a peri-urban county in Iowa. *Renewable Ag. & Food Systems*. Published on-line 10 December 2010. doi:10.1017/S1742170510000505.

Romero, F., K. Delate, D. Hannapel, P. Murphy, and L. Liu. 2010. Horticultural and biochemical variations due to seed source and production methods in three Echinacea species. *Journal of Herbs, Spices & Medicinal Plants* 16:167–192. DOI:10.1080/10496475.2010.511072.

Wiltshire, K., K. Delate, M. Wiedenhoft, and J. Flora. 2010. Incorporating native plants into multifunctional prairie-pastures for organic cow-calf operations. *Renewable Ag. & Food Systems*. Published on-line 25 Sept. 2010. doi:10.1017/S174217051000044X.

Delate, K. 2009. Organic grains, oilseeds, and other specialty crops. In: *Organic Farming and Food Systems*. C. Francis (ed.). *Agron. Monogr.* 54. ASA, CSSA, and SSSA, Madison, WI.

Delate, K., J. DeWitt, A. McKern, D. Rosmann, D.L. Karlen and R. Turnbull. 2009. Bean leaf beetle (Coleoptera: Chrysomelidae) response to soybean variety and organic-compliant treatments in Iowa. *Jour. Agri. Urban Entomol.* 25:145-163.

Delate, K., and Chase, C. 2009. Compost application and red clover underseeding have mixed effect on organic flax production in Iowa. Online. *Crop Management* doi:10.1094/CM-2009-0615-01-RS.

Romero, F., K. Delate, G.A. Kraus, A.K. Solko, P. Murphy and D.J. Hannapel. 2009. Alkamide production from hairy root cultures of Echinacea. *In Vitro Cellular and Developmental Biology* 45(5):599–609. DOI: 10.1007/s11627-008-9187-1.

Delate, K., C. Cambardella, C. Chase, and R. Turnbull. 2008. Beneficial system outcomes in organic fields at the Long-Term Agroecological Research (LTAR) site, Greenfield, Iowa, USA. *Organic E-prints*: <http://www.orgprints.org/12441/>.

Chase, C., K. Delate, M. Liebman, and K. Leibold. 2008. Economic analysis of three Iowa rotations. *PMR* 1001. Iowa State University, Ames, IA.

Delate, K., J. Walker, R. Volz, J. Johnston, A. White, V. Bus, R. Turnbull, D. Rogers, L. Cole, N. How, S. Guernsey, and A. McKern. 2008. Organic apple production in two humid regions: Comparing progress in pest management strategies in Iowa and New Zealand. *HortScience* 43(1):12–21.

Delate, K., J. T.S. Walker, R. Volz, J. Johnston, A. White, V. Bus, R. Turnbull, D. Rogers, L. Cole, N. How, S. Guernsey, and A. McKern. 2008. Organic apple systems: Constraints and opportunities for producers in local and global markets. *HortScience* 43(1):6–11.

Delate, K., C. Cambardella, and A. McKern. 2008. Effects of organic fertilization and cover crops on an organic pepper system. *HortTechnology* 18: 215 - 226.

Karlen, D.L., C.A. Cambardella, C.T. Bull, C.A. Chase, L.R. Gibson, and K. Delate. 2007. Producer–researcher interactions in on-farm research: A case study in developing a certified organic research site. *Agronomy Journal* 99:779–790.

Delate, K. 2006. Incorporating organic and agroecological approaches into the University curricula: The Iowa State University Graduate Program in Sustainable Agriculture. *HortTechnology* 16(3): 445–448.

Delate, K., C. Chase, M. Duffy, and R. Turnbull. 2006. Transitioning into organic grain production: An economic perspective. Online. *Crop Management* doi:10.1094/CM-2006-1016-01-RS.

Delate, K., Turnbull, R., and DeWitt, J. 2006. Measuring and communicating the benefits of organic foods. Online. *Crop Management* doi:10.1094/CM-2006-0921-14-PS.

Ngouajio, M., K. Delate, E. Carey, A.N. Azarenko, J.J. Ferguson, and W.J. Sciarappa. 2006. Curriculum development for organic horticulture. *HortTechnology* 16(3): 413–417.

Rogers, D.J., L.M. Cole, K.M. Delate, and J.T.S. Walker. 2006. Managing bronze beetle, *Eucolaspis brunnea*, in organic apple orchards. *New Zealand Plant Protection* 59:57-62.

Delate, K., J. DeWitt, A. McKern and R. Turnbull. 2005. Integrated approaches to organic pest management in the Midwestern U.S.A.: Case studies of three crops. *Organic-Research.com* – May, 2005 8N –15N.

Davis, D., K. Delate, C. Brummer and C. Mize. 2005. Effect of forage species and tree type on tree establishment and nutritive value of hay crops in an alley-cropped system. *Agroforestry Systems* 65:43–52.

Romero, F., K. Delate, and D, Hannapel. 2005. The effect of seed source, light during germination, and cold-moist stratification on seed germination in three species of *Echinacea* for organic production. *HortScience* 40 (6):875-880.

Delate, K. and C. Cambardella. 2004. Agroecosystem performance during transition to certified organic grain production. *Agronomy Journal* 96: 1288–1298.

Delate, K. and J. DeWitt. 2004. Building a farmer-centered land grant university organic agriculture program – A Midwestern partnership. *Renewable Agriculture and Food Systems* (Formerly The American Journal of Alternative Agriculture) 19(1): 1–12.

Delate, K. and H. Friedrich. 2004. Organic apple and grape performance in the Midwestern U.S. *Acta Horticulturae* 638:309-320.

Vargas, R., [J. Long](#), [N. W. Miller](#), [K. Delate](#), [C. G. Jackson](#), [G. K. Uchida](#), R. C. Bautista, and E.J. Harris. 2004. Releases of *Psytalia fletcheri* (Hymenoptera: Braconidae) and sterile flies to suppress melon fly (Diptera: Tephritidae) in Hawaii. *Jour. Econ. Entomol.* 97(5):1531-1539.

Delate, K., M. Duffy and C. Chase. 2003. An economic comparison of organic and conventional grain crops in a long-term agroecological research (LTAR) site in Iowa. *American Journal of Alternative Agriculture* 18(1): 1-11.

Delate, K. H. Friedrich and V. Lawson. 2003. Organic pepper production systems using compost and cover crops. *Biol. Ag. and Horticulture* 21 (1): 131–150.

Duppong, L.M., K. Delate, M. Liebman, R. Horton, F. Romero, G. Kraus, J. Petrich and L. Sanders. 2003. The effect of natural mulches on crop performance, weed suppression and biochemical constituents of catnip (*Nepeta cataria* L.) and St. John's wort (*Hypericum perforatum* L.) *Crop Science* 44(3): 44:861-869.

Friedrich, H., K. Delate, P. Domoto, and G. Nonnecke. 2003. Effect of organic pest management techniques on apple productivity and food quality. *Biol. Ag. and Horticulture* 21 (1): 1–14.

Delate, K. 2002. Using an agroecological approach to farming systems research. *HortTechnology* 12(3): 345-354.

Delate, K., C. Cambardella, and D. Karlen. 2002. Transition strategies for post-CRP certified organic grain production. Published 28 August 2002. *Crop Management* www.plantmanagementnetwork.org/pub/cm/research/postcrp/

Extension and Outreach Publications

Iowa State has an extensive collection of organic research reports posted at: <http://extension.agron.iastate.edu/organicag/rr.html> Reports include research findings on organic corn and soybean variety trials; sweet corn; peppers; tomatoes; apples; green beans; peas, broccoli; herbs; squash; grapes; flax; barley; wheat; edamame; crop rotations; cover crops; organic no-till; approved fungicides; soil amendments; soil quality; bean leaf beetles; soybean rust; seed coatings; yields; and economics.

Iowa State also has an expansive “[Extension Online Store](#),” where numerous publications can be ordered or downloaded. Even though ISU has published many organic outreach publications, there is no tab or sub-heading for “organic.” To find organic publications, readers should enter the word “organic” in the internal search bar, and descriptions of publications will appear.

ISU Extension organic publications include:

[Growing Organic Vegetables in Iowa](#)

[Using Organic Agriculture and Sustainable Crops and Livestock in the Local Food System](#)

[Fundamentals of Organic Agriculture](#)

[Organic Apple Production in Iowa](#)

[Growing Organic Soybeans on CRP](#)

[Organic Crop Production Enterprise Budgets](#)

[Soil Quality](#)

[Weed Management](#)

[Organic Flax Production in Iowa](#)

[National Directory of Organic Expertise – 2005](#)

Academic Curricula

Classes taught include: Organic Agriculture: Theory and Practice, AGRON/HORT/SUSTAG 484/584.

Marshalltown Community College offers an Associate degree and Certificate in [Entrepreneurial & Diversified Ag](#)

Graduate Student Opportunities

Iowa State offers a [Graduate Program in Sustainable Agriculture](#), and offers many opportunities to graduate students who want to conduct research in certified organic production systems.

Outreach Efforts

Iowa State takes the lead in organizing the annual [Iowa Organic Agriculture Conference](#). ISU also hosts [organic field days](#). In 2008, ISU Extension developed and delivered a [distance education course](#) on transitioning to organic production.

Web Resources

Iowa State's Organic Ag URL is: <http://extension.agron.iastate.edu/organicag/> The site provides access to research reports; publications; upcoming events; regulations; and resources, such as lists of buyers and input suppliers.

In addition, the [Leopold Center for Sustainable Agriculture](#) at Iowa State has a website featuring 120 summaries of [Scientific Findings About Organic Agriculture](#). The summaries are grouped according to topic and contain links to the original published research.

The Iowa Department of Agriculture and Land Stewardship offers [organic certification services](#) and manages the organic certification [cost share](#) program in Iowa. Past issues of [organic newsletters](#) are posted.

The [Iowa Organic Association](#) is a non-profit group of individuals, companies, organizations, and associations dedicated to the advancement of Iowa's organic production and industry, with a goal of representing all facets and concerns of Iowa's organic farmers, wholesalers, retailers, processors, handlers, educators, researchers, consumers and advocates.

Hands-on Learning

Iowa State operates a 6-acre [Student Organic Farm](#), which is an ISU campus club whose membership includes undergraduate and graduate students, faculty, and Ames community members. Food is provided to ISU dining halls, sold at a farmers market, and donated to food shelves.

Acres Certified Organic

Certified organic acres at Iowa State research farms: 36 acres (Greenfield, Crawfordsville and Ames, IA); acres in transition: 5 acres (Gilbert, IA).

Total acres certified, managed organically, or in transition = 41

Organic Livestock Research

None.

Key Contacts

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Dr. Kathleen Delate, ISU Professor of Organic Agronomy and Horticulture (since 1997), kdelate@iastate.edu

Dr. Mark Gleason, ISU Extension Plant Pathologist, mgleason@iastate.edu

Kansas

Organic Research Projects

Brief description of KSU organic farming research:

<http://www.k-state.edu/fungi/Projects/Organic.html>

Specific organic research projects include:

New Rootstock Systems for Disease Management and Increased Productivity in Organic Tomato: Understanding Effects on the Rhizobiome, Karen Garrett, 2012-2015, Funding: The Ceres Trust.

Soil Microbes in Organic Vegetable Production; New Insights from Pyrosequencing. Part II: The Response of Soil Microbial Communities to Nutrient Management and High Tunnels, Karen Garrett, 2010-2013, Funding: The Ceres Trust.

[Estimation of Soil N Availability for Tomato Production in High Tunnel vs. Open Field under Organic and Conventional Management](#), May Elfar Altamimi, KSU, 2012, Funding: SARE.

Soil microbes in organic vegetable production: New insights from pyrosequencing; The response of soil microbial communities to organic and conventional fertilization, Karen Garrett, 2009-2011, Funding: The Ceres Trust.

Implementation of novel grafting methods and rootstocks for organic tomato growers in the Midwest, Sarah A. Masterson, 2011, Funding: Ceres Trust Graduate Student Grant and SARE.

Soil Microbes in Organic Production: Capturing the Active Players, Lorena Gomez, (Karen Garrett and Ari Jumpponen, Major Professors), 2010, Funding: Ceres Trust Graduate Student Grant.

[Participatory Plant Breeding and Agroecology to Develop Intermediate Wheatgrass for Sustainable Grain Production](#), Lee DeHaan, The Land Institute, 2010, Funding: SARE.

[Evaluating the suitability of low-trellises and various hop cultivars for small organic farm production in North-East Kansas](#), Jill Elmers, 2010, Funding: SARE.

[Organic Slot farming: a new approach to growing farming and gardening](#), Rachel Jefferson, 2010, Funding: SARE.

Teaching Organic Agriculture at Market through Art and Fun,
Evangeline Ellingsworth, 2010, Funding: SARE.

Sustainable Pest Control For Organic Pumpkins, Kevin Bauman, 2009, Funding:
SARE.

Developing web resources for organic production in high tunnels, Kimberly
Williams, 2008, Funding: OFRF.

[Kansas City Organic High Tunnel Research Cooperative](#), Stu Shafer, Sandheron
Farm, 2005, Funding: SARE.

[Comparing Organic and Conventional Fertilization Methods for Cut Flower
Production in Haygrove High Tunnels](#), Katherine Stolp, KSU, 2004, Funding:
SARE.

Refereed Publications

Talavera-Bianchi, M., E. Chambers IV, E.E. Carey, D.H. Chambers, 2010. Effect of
organic production and fertilizer variables on the sensory properties of pac choi
(*Brassica rapa* var. Mei Qing Choi) and Tomato (*Solanum lycopersicum* var. Bush
Celebrity), *Journal of the Science of Food and Agriculture*, 90(6):981-988.

Kohake, D.J., L.J. Hagen, E.L. Skidmore, 2010. Wind erodibility of organic soils,
Soil Science Society of America Journal, 74:250-257.

Reinstein, S., J.T. Fox, X. Shi, M.J. Alam, D.G. Renter, T.G. Nagaraja, 2009.
Prevalence of *Escherichia coli* O157:H7 in organically and naturally raised beef
cattle, *Applied and Environmental Microbiology*, 75(16):5421-5423.

Zhao, X., J.R. Nechols, K.A. Williams, W. Wang, E.E. Carey, 2009. Comparison of
phenolic acids in organically and conventionally grown pac choi (*Brassica rapa* L.
Chinensis group). *Journal of the Science of Food and Agriculture*, 89:940-946.

Jacob, M.E., J.T. Fox, S. Reinstein, T.G. Nagaraja, 2008. Antimicrobial
susceptibility of foodborne pathogens in organic or natural production systems: An
overview, *Foodborne Pathogens and Disease*, 5(6):721-730.

Nelson, N.O., R.R. Janke, 2007. Phosphorus sources and management in organic
production systems, *HortTechnology*, 17:442-454.

Extension and Outreach Publications

Sensitive Crop Grown Here (sign), S151 (2008)

[Challenges and Information Needs for Organic Production in Kansas](#), (2006)

Economic Issues with Value-Enhanced Corn, MF2430 (1999)

Green Manure Crops, EP11 (1999)

Economic Issues with Specialty Crops, MF2427 (1999)

Economic Issues with Organic or Natural Beef, MF2432 (1999)
Organic Certification, MF2344 (1998)

Academic Curricula

HORT325 – Introduction to Organic Farming
HORT690 – Sustainable Agriculture

Graduate Student Opportunities

An [Urban Food Systems](#) specialization is available within the Master's Degree program in Kansas State's Department of Horticulture, Forestry, and Recreation Resources.

Outreach Efforts

To date, KSU has not hosted an organic farming conference or organized annual organic field days.

Web Resources

Links to articles and publications on organic certification; organic crop production; organic farming; organic fruit production; organic livestock production; and organic vegetable production are posted at:

<http://www.kansasustainableag.org/Library/O.htm>

Kansas Center for Sustainable Agriculture and Alternative Crops – College of Engineering: <http://kcsaac.engg.ksu.edu/>

Kansas Organic Producers Association: <http://www.kansasruralcenter.org/kop.htm>

Kansas Rural Center organic farming resources:

<http://www.kansasruralcenter.org/eqip.html>

[The Land Institute](#)

Hands-on Learning

[Willow Lake Student Farm](#), operated by Department of Horticulture, Forestry & Rec. Resources, is not certified organic, but managed sustainably and staffed by students; faculty advisor is Dr. Rhonda Janke.

Acres Certified Organic

1 acre.

Organic Livestock Research

None.

Key Contacts

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Dr. Rhonda Janke, Associate Professor of Horticulture, rrjanke@ksu.edu
Dr. Gerad Middendorf, Associate Professor of Sociology, middendo@ksu.edu
Meg Mullett, Johnson County K-State Research and Extension Master Gardener

Michigan

Organic Research Projects

Fostering Complex Soil Food Webs and Building Soil Fertility with Organic Production: Perennial Wheat Phase Two. Sieglinde Snapp, 2013-2016, Funding: The Ceres Trust.

On-farm organic soybean variety trials, Dale R. Mutch, Dean Baas, Dan Rossman, 2012-2017, Funding: The Ceres Trust and NCRSARE.

Effect of cover crops on nitrous oxide emissions, nitrogen availability and carbon accumulation in organic versus conventionally managed systems, Dale R. Mutch, Dean Baas, 2012-2014, Funding: NIFA/USDA Organic Transition.

An integrated approach to optimizing the performance of cereal-legume cover crop mixtures and improving synchrony of N from organic residues, Z. Hayden/M. Ngouajio, 2012-2014, Funding: USDA-NIFA.

Increasing the productivity of organic dry bean systems in United States, Karen Renner, Erin Taylor, Jim Kelly, Christy Sprague, Dale Mutch, Dan Rossman, Christina DiFonzo, 2010-2014, Funding: USDA-OREI.

On-farm organic soybean variety trials, Dale R. Mutch. 2011-2014, Funding: The Ceres Trust.

Development and delivery of living pest management for organic greenhouses and local food systems, Matthew J. Grieshop, 2011-2014, Funding: The Ceres Trust.

Organic management effects on individual species of mycorrhizal fungi and the consequences of plant performance and soil health, Sieglinde Snapp, 2011-2013, Funding: The Ceres Trust.

Control of plum curculio and codling moth using strip cultivation in organic apples, William Baughman, (Matthew J. Grieshop, Major Professor), 2013, Funding: Ceres Trust Graduate Student Grant.

Exploring the combination of biofumigation and anaerobic soil disinfestation for soil quality enhancement in organic vegetable cropping systems, A. Yoder, (M. Ngouajio, Major Professor), 2012-2013, Funding: Ceres Trust Graduate Student Grant.

Combining alternating cover crop strips, living-mulches and strip tillage for weed and nutrient management in organic sweet corn, C. Lowry/D. Brainard. 2011-2013, Funding: The Ceres Trust and USDA-NC SARE.

Enhancing soil quality, plant health, and disease management in organic production with Brassica cover crops used as biofumigants, M. Ngouajio, 2011-2013, Funding: The Ceres Trust.

Mycorrhizal role in organic row crop production long-term experimentation, Sieg Snapp, 2011-2013, Funding: The Ceres Trust.

Enhancing soil quality plant health and disease management in organic production with Brassica cover crops used as biofumigants, Mathieu Ngouajio, Jianjun Hao, Vicki Morrone, 2011-2013, Funding: The Ceres Trust.

Unraveling the mystery of compost teas used for organic disease and insect pest management, Annemiek Schilder, 2011-2013, Funding: The Ceres Trust.

Fostering complex soil food webs and building soil fertility with organic production: the potential of perennial wheat, S. Snapp, 2010-2013, Funding: The Ceres Trust.

Practical Perennials: Partnering with farmers to develop a new wheat crop, Sieg Snapp, Scott Swinton, 2009-2013, Funding: USDA OREI.

[Non-Antibiotic Alternatives for Bovine Mastitis Therapy](#), Bo Norby, MSU, 2012, Funding: SARE.

A Novel Approach for Optimizing the Benefits of Cereal-Legume Cover Crop Mixtures in Vegetable Cropping Systems, Z. Hayden/M. Ngouajio, 2009-2012, Funding: SARE.

High tunnel organic raspberry production. Ben Gluck and Eric Hanson. Ongoing, Funding: The Ceres Trust, USDA-OREI and Internal Sources.

Evaluation of Plant Composition and Strip Size on the Effectiveness of Native Plant Conservation Strips for Sustainable Enhancement of Beneficial Insect, Brett Blaauw, 2009-2012, Funding: NC-SARE.

Use of Native Plants to Enhance Arthropod Mediated Ecosystem Services, PI - Doug Landis; Collaborators: Megan Woltz, J. Tuell, A. Fiedler, R. Isaacs, M. Gardiner, Funding: USDA NRI.

Native plant conservation strips for sustainable pollination and pest control in fruit crops, Rufus Isaacs, 2008-2012, Funding: NC-SARE.

Unraveling the mystery of compost teas used for organic disease management, Annemiek Schilder, Matthew Grieshop, Eric Hanson, John Biernbaum, 2011-2012, Funding: OFRF.

Unraveling the Mystery of Compost Teas Used for Organic Disease and Insect Pest Management, Annemiek Schilder, 2010-2013, Funding: The Ceres Trust.

Organic production of fruit crops under high tunnels, Eric Hanson, Greg Lang, John Biernbaum, 2010-2012, Funding: The Ceres Trust.

Holistic Integration of Organic Strategies and High Tunnels for Midwest/Great Lakes Fruit Production, Greg Lang, John Biernbaum, Dan Brainard, Matthew Greishop, Eric Hanson, Rufus Issacs, Vicki Morrone, Annemiek Schilder, 2010-2012, Funding: USDA NIFA.

Summer cover crops for weed suppression and soil quality in organic vegetable production in the Great Lakes region - Multistate with Cornell University, Dan Brainard, Mathieu Ngouajio, Dale Mutch, Vicki Morrone, Carolyn Lowry, 2010-2012, Funding: USDA OREI.

Competency-based Assessment of Liberal Learning Goals through Institutional Experiential Education for Global Sustainability; Assessing learning at the Student Organic Farm and other sites, Geoffrey Habron, Laurie Thorp, 2010-2012, Funding: Fund for the Improvement of Post Secondary Education, U.S. Department of Education.

Fostering complex soil food webs and building soil fertility, Sieg Snapp, 2009-2012, Funding: The Ceres Trust.

Integrating organic apple and pork production to benefit pest management and grower profitability, Matt Greishop, David Epstein, Dale Rozeboom, George Sundin, 2009–2012, Funding: The Ceres Trust.

Development of a holistic management plan for the apple Flea Weevil, Matthew Grieshop, 2011, Funding: OFRF.

Vermicomposting of Food Residuals from MSU Campus, John Biernbaum, Laurie Thorp, 2010-2011, Funding: Office of Campus Sustainability.

Optimizing mulch and fertilizer use in organic blueberries, Eric Hanson, Annemiek Schilder, Jesse Sadowsky. 2009-2011, Funding: OFRF.

A novel approach for optimizing the benefits of cereal-legume cover crop mixtures in vegetable cropping systems under organic management, Z. Hayden/M. Ngouajio, 2010-2011, Funding: The Ceres Trust.

Perennial wheat variety development for organic farmers, Janet Lewis, Sieg Snapp, 2009-2011, Funding: USDA Sust Ag grant to Hamm/MSU.

Long-term ecological research on row crop production at Kellogg Biological Station, PI - P Robertson, 2007-2011, Funding: NSF

Potential for Use of Perennial Grasses as Organic Dual-Purpose Forage-Grain Crops in Michigan, Sienna Tinsley, 2011, Funding: The Ceres Trust.

The Impact of entomopathogenic nematode applications on mortality of codling moth larvae on the orchard floor, Nathaniel J. Walton, (Matthew J. Grieshop, Major Professor), 2011, Funding: Ceres Trust Graduate Student Grant.

Combining alternating cover strips, living mulches and strip tillage for effective weed and nutrient management in organic sweet corn production, Carolyn J. Lowry, 2011, Funding: The Ceres Trust.

Optimizing mulch and fertilizer use in organic blueberries, Eric Hanson, 2008-2011, Funding: OFRF.

Evaluation of Apple Flea Weevil Dispersal and the Potential of Kaolin-Based Management in Organic Apples, John Pote, 2010, Funding: The Ceres Trust.

Potential of organic hogs as a tool for post-harvest orchard floor sanitation and pest management, Krista A. Buehrer, 2010, Funding: The Ceres Trust.

Soil Invertebrate Biodiversity Under Contrasting Orchard Management Regimes in Michigan, Nathaniel J. Walton, (Matthew J. Grieshop, Major Professor), 2010, Funding: Ceres Trust Graduate Student Grant.

Improvement of Anthropod Biological Control Systems for Organic Greenhouse Production, Emily Pochubay, (Matthew J. Grieshop, Major Professor), 2010, Funding: Ceres Trust Graduate Student Grant.

A Novel Approach for Optimizing the Benefits of Cereal-Legume Cover Crop Mixtures in Vegetable Cropping Systems Under Organic Management, Zachary D. Hayden, (Mathieu Ngouajio, Major Professor), 2010, Funding: Ceres Trust Graduate Student Grant.

Potential of Organic Hogs as a Tool for Post-Harvest Orchard Floor Sanitation and Pest Management, Krista Buehrer, (Matthew J. Grieshop, Major Professor), 2010, Funding: Ceres Trust Graduate Student Grant.

[Meeting the Growing Demand for Organic Hops: Low-Trellis Organic Hop Production in the Great Lakes Region](#), Brian Tennis, New Mission Organics, 2010, Funding: SARE.

Combining Alternative Cover Crop Strips, Living Mulches and Strip Tillage for Effective Weed and Nutrient Management in Organic Sweet Corn Production, Carolyn Lowry, MSU, 2010, Funding: SARE.

Organic weed management in field crops, Christy Sprague, 2008-2010, Funding: SARE.

Integrated weed management: Fine tuning the system, Karen Renner, 2007-2009, Funding: USDA-CSREES-IOP.

Partnering to Cultivate Organic Agriculture in Michigan and the Midwest, Sieg Snapp, J. Biernbaum, 2005-2009. Funding: USDA-CSREES Organic Transitions.

Identifying new local market opportunities for organic and sustainable veg and fruit farmers, Jim Bingen, Vicki Morrone, 2009, Funding: USDA SCRI.

Adapting organic apple practices for Great Lakes region organic hops production, Matthew Grieshop, 2009, Funding: OFRF.

Integrating bats into organic pest management, Steve Tennes, [Country Mill Farms](#), Charlotte, MI, 2009, Funding: OFRF and SARE.

[Hoophouse and Organic Farming for Ag Lenders](#), Vicki Morrone, MSU, 2009, Funding: SARE.

[Greenhouse and raised bed crop production with organic farm practices with fruit and vegetables production](#), David Beck, 2008, Funding: SARE.

[Determination of the relationship between soil nutrients, mycorrhizae, and plant health in organic blueberry production](#), Jesse Sadowsky, MSU, 2008, Funding: SARE.

How Can We Optimize Flaming for Weed Control in Organic Farming Systems, Tim Frisbie, 2007, Funding: SARE.

[Developing pest management guidelines for organic production of highbush blueberries in the North Central Region](#), Annemiek Schilder, MSU, 2007, Funding: SARE.

Integrated weed management: "One year's seeding" Karen Renner, 2004-2007, Funding: USDA-NC-SARE.

Training for MSUE from organic farmers, Vicki Morrone, 2007, Funding: Project GREEN.

[Evaluating Corn, Soybean and Wheat Varieties in Organic Farm Systems in Michigan](#), Ivan Morley, 2006, Funding: SARE.

[Improved management of striped cucumber beetle , *Acalymma vittatum* \(F.\) \(Coleoptera: Chrysomelidae\) by using a squash trap crop and a polyculture of cucumber and tomato.](#) Matthew Kaiser, MSU, 2006, Funding: SARE.

Community Farmers: The Pathways and Opportunities to Success for New, Innovative Farmers in Michigan, Taylor Reid, 2004, SARE graduate student grant.

[Sweeping the Orchard Floor as a Housekeeping Practice to Effectively Control the Plum Curculio Insect in Organic Orchards](#), James Koan, 2003, Funding: SARE.

[Establishing Successful Organic Orchards](#), Peter Ways, 2003, Funding: SARE.

Refereed Publications

Brainard, D.C., W.S. Curran, R.R. Bellinder, M. Ngouajio, M.J. VanGessel, M.J. Haar, W.T. Lanini and J.B. Masiunas. 2012. Temperature and relative humidity affect weed response to vinegar and clove oil based herbicides. *Weed Technology* (In press available online at <http://www.wssajournals.org/doi/pdf/10.1614/WT-D-12-00073.1>).

Grieshop, Matthew J., Werling, Ben, Buehrer, Krista, Perrone, Julia, Isaacs, Rufus, Landis, Douglas A. 2012. Big brother is watching: studying insect predation in the age of digital surveillance. *American Entomologist*. In press.

Grieshop, Matthew J., Arthur, Frank H., Rogers, Ted. 2012. Organic Approaches and Regulations for Stored Product Pest Management. In *Stored Production Protection*, eds. Tom W. Phillips, David Hagstrum, & G Cuperus, 352. Manhattan, KS.

Grieshop, Matthew J., Hanson, Eric J., Schilder, Annemiek, Isaacs, Rufus, Mutch, Dale, Garcia-Salazar, Carlos, Longstroth, Mark, Sadowsky, Jesse. 2012. Status update on organic blueberries in Michigan. *International Journal of Fruit Science* 12: 232-235.

Hayden, Z.D., D.C. Brainard, B. Henshaw, and M. Ngouajio. 2012. Winter annual weed suppression in rye-vetch cover crop mixtures. *Weed Technology* 26: 818-825.

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Nair A. and M. Ngouajio. 2012. Soil microbial biomass, functional microbial diversity, and nematode community structure as affected by cover crops and compost in an organic vegetable production system. *Applied Soil Ecology* 58:45-55.

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Pochubay, Emily A., Grieshop, Matthew J. 2012. Intraguild predation of *Neoseiulus cucumeris* by *Stratiolaelaps miles* and *Atheta coriaria* in greenhouse open rearing systems. *Biological Control*. In press.

Taylor, E. C., K. A. Renner, C. L. Sprague. 2012. Organic weed management in field crops with a propane flamer and rotary hoe. *Weed Technology*. 26:793-799.

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Reid, T. 2008. Organic Farming. *Encyclopedia of Environmental Ethics and Philosophy*. J. Baird Callicott and Robert Frodeman (eds.). New York: Macmillan Library Reference (Thompson Gale),

Bingen, Jim, Carol Osborne, Emily Reardon. 2007. *Organic Agriculture in Michigan. 2006 Survey Report*. East Lansing: MSU and MOFFA.

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Hill E.C., M. Ngouajio, and M.G. Nair. 2007. Allelopathic Potential of Hairy Vetch and Cowpea Methanol and Ethyl Acetate Extracts on Weeds and Vegetables. *Weed Technology*. 21:437-444.

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Delind, Laura B., Jim Bingen. 2005. "Be Careful What You Wish For: Democratic Challenges and Political Opportunities for the Michigan Organic Community." *Culture & Agriculture*. 27, 2: 131-143.

Extension and Outreach Publications

[Engineering Living Pest Management.pdf \(2012\)](#)
[Influence of Cover Crops on Beans.pdf \(2012\)](#)
[Integrated Reduced Tillage.pdf \(2012\)](#)
[Compost tea and impact on disease control.pdf \(2012\)](#)
[Ecosystem services provided by Perennial grains.pdf \(2012\)](#)
[Organic Marketing Trends in US for 2012.pdf \(2012\)](#)
[Role of Cover Crops.pdf \(2012\)](#)
[Vermicomposting of campus food residuals and waste at the Student Organic Farm, John Biernbaum, MSU Department of Horticulture \(2011\)](#)
[Carbon and nutrient cycling and beneficial microorganisms in organic and conventionally managed blueberry soils in Michigan, Jesse Sadowsky and Annemiek Schilder, MSU Department of Plant Pathology \(2011\)](#)
[Organic tomato and pumpkin production, Dale R. Mutch, Todd E. Martin, W.K. Kellogg Biological Station \(2011\)](#)
[Michigan organic soybean variety comparison trials, Dan Rossman, MSU Extension, Gratiot County \(2011\)](#)
[Managing soil organic matter and nitrogen in organic field crops: Lessons from a 12 year trial, Sieglinde Snapp, MSU Department of Crop and Soil Sciences and W.K. Kellogg Biological Station \(2011\)](#)
[Building Soil for Organic and Sustainable Farms: Where to Start? Vicki Morrone and Sieglinde S. Snapp \(2011\)](#)
[Advanced Soil Organic Matter Management, Sieglinde Snapp and Stuart Grandy \(2011\)](#)
[Building Soils Organically: Is This a Moving Target? Sieglinde Snapp \(2011\)](#)
[How Much Carbon Can be Sequestered by Organic-based Cropping Systems in MI Soils? Alexandra Kravchenko \(2011\)](#)
[Organic research conducted by MSU Extension at Kellogg Biological Station Dale Mutch \(2011\)](#)
[Michigan Organic Food & Farming Reporting Session & Poster Contest Abstracts \(2010\)](#)
[Organic Farming Principles and Practices, John A. Biernbaum](#)
[Organic Blueberry Research at MSU \(2009\)](#)
[Ecological Management of Winter Weeds in Pea-Wheat-Corn Rotations, Daniel Brainard \(2009\) Organic Reporting Session](#)
[Assessing Four Winter Squash Cultivars as Trap Crops to Improve Cucumber Beetle Management in Organic Cucumber Production, Vianney Willot \(2009\)](#)
[Transitioning to Certified Organic in Michigan – Where to Start? Vicki Morrone \(2008\)](#)
[The Organic Food Market \(2007\)](#)
[The Market for Organic and Fortified Eggs \(2004\)](#)
[First World Congress on Organic Food: Proceedings Meeting the Challenges of Safety and Quality for Fruits, Vegetables and Grains \(2004\)](#)
[Business Opportunities in Specialty Food Products \(2002\)](#)

Academic Curricula

The following undergraduate degrees/concentrations are offered:
[Sustainable and Organic Concentration in Horticulture](#)

[Undergraduate Specialization in Sustainable Agriculture and Food Systems](#)

Courses include:

HRT/CSS 251 Organic Farming Principles and Practices (3 credits)

HRT 243 Organic Transplant Production (1)

HRT 253 Compost Production and Use (1)

HRT 258 Study a Farm (Organic farming field study) (3)

CSS 360 Soil Biology (3)

ENT 479 Organic Pest Management (3)

CSS 442 Agroecology (3)

CSS 424 Sustainable Agriculture and Food Systems SAFS Capstone (3)

ACR 891B and ACR 854 Issues in Organic Agric. & Social Movements in Agric.

MSU offers year-round Organic Farm and Organic Farmer Training Certificate Program at the [Student Organic Farm](#), funded in part by a \$50,000 endowment for scholarships for future organic farmers from two “Hoophouse Gala” fundraising dinners and silent auctions.

Graduate Student Opportunities

Michigan State offers an [Ecological Food and Farming Systems](#) (EFFS) graduate specialization, as well as numerous opportunities for graduate student research in organic agriculture.

Examples of recent graduate student research projects include:

- A novel approach for optimizing the benefits of cereal-legume cover crop mixtures in vegetable cropping systems under organic management. Zachary Hayden and Mathieu Ngouajio 2010-2011.
- Potential of organic hogs as a tool for post-harvest orchard floor sanitation and pest management. Krista Buehrer and Matthew Grieshop 2010-2011.
- Improvement of arthropod biological control systems for organic greenhouse production; Emily Pochubay and Matthew Grieshop; 2010-2011.
- Soil invertebrate biodiversity under contrasting orchard management regimes in Michigan; Nathaniel Walton and Mathew Grieshop; 2010-2011.
- A Novel Approach for Optimizing the Benefits of Cereal-Legume Cover Crop Mixtures in Vegetable Cropping Systems. Zachary Hayden and Mathieu Ngouajio, 2009-2012.

Outreach Efforts

The [Michigan Organic Reporting Sessions](#) are annual day-long events to share progress and results of MSU organic production and marketing research.

MSU maintains an extensive [calendar of events](#) featuring outreach opportunities around and outside of Michigan.

Serving Michigan's Multicultural Agriculture - Outreach related to organic farming, compost, transplants and season extension for farmers learning to grow food for the Covert school system. 2010-2012, funded by USDA through Michigan Food and Farming Systems (MIFFS).

Faculty and staff from MSU help develop and deliver the following: Michigan Organic Listserve; NRCS District Conservationist Organic Training; FSA Education on Organic Systems; Midwest Extension Educators Advanced Organic Farming Workshops; Student Organic Farm Four Season Diversified Organic Farming Workshops (funded by RMA Community Partnership Grant); Annual Michigan Organic Conference and Preconference Organic Reporting Sessions; Annual Great Lakes Fruit and Vegetable Expo Organic Program; and numerous Field Days and Workshops.

Multiple presentations in recent years at the Midwest Organic and Sustainable Education Service (MOSES) Conference (e.g., Biernbaum, Montri, Lang, Hanson, Gluck, Morrone, Snapp)

Web Resources

<http://www.michiganorganic.msu.edu> Organic vegetable and field crop production information from MSU and beyond. Also available is information on certification of farms.

<http://www.new-ag.msu.edu> is the site of the New Ag Network, an online newsletter from farmers and researchers in the Great Lakes region, including Michigan, Indiana, Illinois and Iowa. Information is appropriate for crop and vegetable farmers seeking input on organic soil building, field management, and cover crop implementation.

<http://www.mccc.msu.edu/> The Midwest Cover Crops Council (MCCC) facilitates adoption of cover crops throughout the Midwest to improve ecological, economic, and social sustainability.

eOrganic/eXtension communities of practice materials for organic farmer soil management developed by Snapp, including:
<http://www.extension.org/pages/61075/managing-for-soil-organic-matter>

<http://www.covercrops.msu.edu/species/index.html> offers several publications on different species of cover crops including crimson clover, oil seed radish and medics.

<http://www.covercrops.msu.edu/systems/index.html> offers info on organic systems based on research from Kellogg Biological station, MSU.

<http://www.covercrops.msu.edu/> Cover crops for Michigan, varieties and management.

<http://www.mccc.msu.edu/selectorINTRO.html> is the site to use the cover crop selector tool where farmers choose the criteria they are seeking and identify their local and the calculator provides cover crop variety options.

[Soil Ecology and Management](#) explores the [soil ecosystem](#) , including the interrelationships of [soil biological](#), chemical and physical processes.

<http://nativeplants.msu.edu/> Enhancing Biological Control with Native Plants

Organic Pest Management - www.opm.msu.edu

Pesticide Alternatives Laboratory - www.whalonlab.msu.edu

Organic Fruit - www.organicfruit.msu.edu

Hoophouses and High tunnels - www.hoophouse.msu.edu

CS Mott Group for Sustainable Food Systems - www.mottgroup.msu.edu

Kellogg Biological Station [Long-term Ecological Research Program](#)

<http://www.productcenter.msu.edu/> The MSU Product Center for Agriculture and Natural Resources (ANR). The center can help develop and commercialize high value, consumer-responsive products and businesses in the agriculture and natural food sectors.

<http://www.ipm.msu.edu/new-ag/soybeanrust.htm> Soybean rust resources at New Ag Network with reports throughout the growing season of action needed and suggested management tools to reduce soybean rust incidence.

<http://www.safs.msu.edu/> is a site of soil and sustainable agriculture information including cover crops, nutrient management, soil ecology, economic analysis, integrated pest management, biological control with native plants, and more.

<http://web1.msue.msu.edu/fis/extension.htm> offers resources for farmers using forage for animal production or ground cover systems.

<http://www.moffa.org/> Michigan Organic Food and Farming Alliance brings consumers and farmers together to understand the values of organic and local food systems in Michigan.

Hands-on Learning

The [MSU Student Organic Farm](#) is a 10-acre, certified organic year-round teaching and production farm. The farm also operates an intensive 9-month Organic Farmer Training Program (OFTP) in year-round organic farming focusing on diversified production of vegetables, flowers, fruits and herbs for local markets.

MSU organizes the [Organic Farming Mentor Program](#), which is an opportunity for experienced organic farmers to teach and help those new to the practice.

Acres Certified Organic

19 acres certified organic by OCIA at the Kellogg Biological Station.

Organic Livestock Research

Some of the organic fruit research done by Grieshop involves livestock, as pigs are used to eat the June drops in the apple orchard and plum curculio larvae die in the gut of the pig.

Key Contacts

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Minnesota

Organic Research Projects

Cropping Systems

Breeding dry edible beans for organic production, Tom Michaels, Craig Sheaffer, Michael Sadowski, 2012-2106, Funding: USDA/NIFA OREI.

Climate and Corn-based Cropping Systems CAP (CSCAP). Jeff Strock, SWROC, 2012-2016. CSCAP is a transdisciplinary partnership among 11 institutions that seeks to increase resilience and adaptability of Midwest agriculture to more volatile weather patterns by identifying farmer practices and policies that increase sustainability while meeting crop demand. Funding: Organic Valley-FAFO to support two organic research sites.

Genetic diversity within heirloom dry edible beans, Tom Michaels, Craig Sheaffer, 2012-2016, Funding: USDA/NIFA/OREI.

Evaluating Alfalfa Mulch as a Nitrogen Source for Corn Production, Deborah Allan, Laura Fernandez, Craig Sheaffer, 2011-2014, Funding: The Ceres Trust.

Metagenomic Exploration of Cover Crop and Amendment Effects on Functional Bacterial Communities in Organic Soil, Craig Sheaffer, 2011-2014, Funding: The Ceres Trust.

Alternative crops after Corn and Soybeans, including Amaranth, Buckwheat, Dry Bean, Field Pea, Flax, Spring Wheat, Sorghum and Sunflower, Craig Sheaffer, Don Wyse, 2013, Funding: USDA.

Annual legumes to supply nitrogen, Craig Sheaffer, Deborah Allan, John Lamb, 2013, Funding: USDA.

Cutting management of alfalfa to enhance N contributions, Craig Sheaffer, Deborah Allan, John Lamb, 2013, Funding: USDA.

Development and Demonstration of a New Method of Physical Weed Control - “propelled abrasive grit management” (PAGMan) implement and system for mechanical control of weed seedlings in row crops. Brief video available at; <http://www.ars.usda.gov/Services/docs.htm?docid=22766>. Frank Forcella, Dan Humburg, Sharon Clay, 2010-2013, Funding: NC-SARE.

Interseeding cover crops in soybeans, Craig Sheaffer, Don Wyse, 2013, Funding: USDA.

Radish cover crops, Don Wyse, Marian Geiske, Beverly Durgan, 2012-2013, Funding: Minnesota Agricultural Experiment Station.

Spring seeding dates for organic peas and lentils, Don Wyse, Adria Fernandez, Craig Sheaffer, 2012-2013, Funding: Minnesota Agricultural Experiment Station.

Weed management in transplanted vegetables with rolled winter rye, Craig Sheaffer, Matt Leavitt, Don Wyse, 2011-2012, Funding: Minnesota Agricultural Experiment Station.

Winter pea evaluation, Craig Sheaffer, Don Wyse, Adria Fernandez, 2011-2012, Funding: Minnesota Agricultural Experiment Station.

Dry field beans for local foods, Tom Michaels, Craig Sheaffer, John Lamb, 2009-2012, Funding: The Ceres Trust.

Efficacy of buckwheat intercropping in organic soybeans for management of the soybean aphid, Thelma Heidel, (David Ragsdale, Major Professor), 2010, Funding: Ceres Trust Graduate Student Grant.

Economics

[Tools for Transition](#): Financial Data Resources and Educational Materials for Farmers Transitioning to Organic Production, Rob King, Gigi DiGiacomo, Richard Joerger, Meg Moynihan, Helene Murray, Dale Nordquist, Jim Riddle, 2011-2014, Funding: USDA/NIFA/OREI.

Economic Analysis of Organic and Conventional Cropping Systems in Minnesota, Rob King, Jeff Coulter, Tim Delbridge, Craig Sheaffer, Don Wyse, 2011-2013, Funding: Minnesota Agricultural Experiment Station.

Organic Farm Performance in Minnesota Report, Meg Moynihan, Minnesota Department of Agriculture, 2008, Funding: OFRF.

Food Safety

Development of Sanitizers for Utilization in Organic Food Processing and Crop Production, Francisco Diez-Gonzalez, Joellen Feirtag, Mastura Akhtar, Hongshun Yang, Stelios Viazis, 2010-2013, Funding: USDA/Integrated Organic Program.

Horticultural Systems

SWROC High Tunnel: Improving Soil Health and Increasing Rotation Options for Organic Vegetable Production, Paulo Pagliari, 2012-2015, Funding: The Ceres Trust.

Evaluation of Potato Breeding Lines under Organic Growing Conditions, Christian Thill, Hugh Duffner, 2012-2013, Funding: Northern Plains Potato Growers Association.

Organic Fruit and Berry Production in High Tunnels in Zones 2 and 3, Terrance Nennich, Karl Foord, Michelle Grabowski, Jim Luby, 2011-2013, Funding: Northwest Minnesota Regional Sustainable Partnership and Northwest Minnesota Foundation.

Organic Soil Fertility in High Tunnels, Terrance Nennich, Jerry Wright, Carl Rosen, 2011-2013, Funding: North West Regional Sustainable Partnership, Northwest Minnesota Foundation.

Antibiotic Uptake by Vegetable Crops from Manure-Applied Soils, Satish Gupta,

Dong Hee Kang, Carl Rosen, Vincent Fritz, Ashok Singh, Yogesh Chander, Helene Murray, 2011-2012, Funding: NCR-SARE.

SWROC High Tunnel: Extending the season for organic vegetable production, Pauline Nickel, 2009-2012, Funding: The Ceres Trust and FAFO.

Quantifying Outgassing from Plastics Used in High or Low Tunnel Systems, Andrew J. Petran, (Albet Markhart, Major Professor), 2011, Funding: Ceres Trust Graduate Student Grant.

Livestock Systems

Strategies to Improve Profitability of Organic Dairy Herds in the Upper Midwest, Brad Heins, Marcia Endres, Roger Moon, Craig Sheaffer, Ulrike Sorge, Rob King, Sharon Weyers, Jim Paulson, Deb Heleba, 2013-2016, Funding: USDA/NIFA/OREI.

Effect of Kelp on Performance and Growth of Group Fed Organic Dairy Calves
Brad Heins, Hugh Chester-Jones, Jim Paulson, 2012-2013, Funding: Minnesota Agricultural Experiment Station.

Effect of Organic Grain Supplementation on Economic, Behavior, and Pest Management Strategies of Organic Dairy Cows, Brad Heins, Marcia Endres, Roger Moon, James Paulson, 2011-2013, Funding: The Ceres Trust.

Effects of growth, meat quality, and profitability of organically raised dairy-beef steers, Brad Heins, Elizabeth Bjorklund, Hugh Chester-Jones, 2011-2013. Funding: Minnesota Agricultural Experiment Station and NCR-SARE.

Effect of whole milk feeding duration with group fed calves on growth, health, and behavior of organic dairy calves, Elizabeth A. Bjorklund, (Brad Heins, Major Professor), 2011, Funding: Ceres Trust Graduate Student Grant.

Integrated organic dairy research and extension planning, Heins, B.; Endres, M. I.; Raeth-Knight, M., 2009-2011, Funding: USDA-NIFA.

Biological and Cultural Fly Control Options for Organic Dairies, Jessica Starcevich, (Roger Moon, Major Professor), 2010, Funding: Ceres Trust Graduate Student Grant.

Track and research changes in mammary health and fertility in a transitioning dairy herd. Brad Heins, 2008-2009, Funding: FAFO.

Additional SARE-funded organic research in Minnesota:

[Effect of Growth Meat Quality, and Profitability of Organically Raised Dairy-Beef Steers](#), Elizabeth Bjorklund, Brad Heins, UMN, 2012, Funding: SARE.

[Organic Beans and Peas: Nutritious and Gluten-free Local Foods](#), Craig Sheaffer, UMN, 2011, Funding: SARE.

[Small-Scale Oilseed Processing: Evaluating Edible Camelina Oil for its Market Demand and Value-Added Opportunities, Kathleen Batalden Smith](#), Omega Maiden Oils, 2010. Funding: SARE.

[Profiling Microbial Communities in Soils from Organic, Sustainable, and Conventional Cropping Systems](#), Adria Fernandez, UMN, 2010, Funding: SARE.

[Reducing the Impact of Soybean Aphid on Organic Soybeans through Multiple Management Tactics](#). Mark Askegaard, 2009, Funding: SARE.

Growing Blackberries Organically under High Tunnels for Winter Protection and Increased Production, Erik Gundacker, Scenic Valley Farm, 2009, Funding: SARE.

[Build it and they will come: Integrating beneficial beetle habitat with organic growing systems economically](#), Juan Carlos Cervantes, 2008, Funding: SARE.

[Controlling Western Striped Cucumber Beetles Using Organic Methods: Perimeter Trap Crops and Baited Sticky Traps](#), Peter Hemberger, 2006, Funding: SARE.

[Organic Dairy Short Course for Ag Professionals](#), Meg Moynihan, MDA, 2006, Funding: SARE.

[Improved Management of Rye Cover Crops for Organic Soybean Production](#), Don DeWeerd, 2004, Funding: SARE.

[Microbial Safety of Organic Fruits and Vegetables](#), Francisco Diez-Gonzalez, UMN, 2003, Funding: SARE.

[Comparing Vesicular-Arbuscular Mycorrhizal Colonization in Conventional versus Organic Strawberry Production Systems](#), Marjorie Ross, UMN, 2003, Funding: SARE.

Refereed Publications

The University of Minnesota Library has established a database where published [organic research papers](#) are described and archived, with links to the published papers, which are summarized below:

Delbridge, T. A., King, R. P., 2012. Conversion to Organic Farm Management: A Dynamic Programming Approach, *Agricultural and Applied Economics Association*.

Fernandez, A. L., Sheaffer, C. C., Wyse, D. L. and Michaels, T. E., 2012. Yield and Weed Abundance in Early- and Late-Sown Field Pea and Lentil, *Agron.J.*

Koch, R. L., Porter, P. M., Harbur, M. M., et al., 2012. Response of soybean insects to an autumn-seeded rye cover crop, *Environ.Entomol.*

- Seufert, V., Ramankutty, N. and Foley, J. A., 2012. Comparing the yields of organic and conventional agriculture, *Nature*.
- Stone, A. G., Treadwell, D. D., Riddle, J. A., Formiga, A. K., et al., 2012. eOrganic: The Organic Agriculture Community of Practice for eXtension, *HortTechnology*.
- Yue, C., Hurley, T. and Anderson, N. O., 2012. Heterogeneous consumer preferences for native and invasive plants: Evidence from experimental auctions, *HortScience*.
- Coulter, J. A., Sheaffer, C. C., Haar, M. J., Wyse, D. L. and Orf, J. H., 2011. Soybean cultivar response to planting date and seeding rate under organic management, *Agron.J.*
- Delbridge, T. A., Coulter, J. A., King, R. P., Sheaffer, C. C. and Wyse, D. L., 2011. Economic performance of long-term organic and conventional cropping systems in Minnesota, *Agron.J.*
- Francis, C. A., Jordan, N., Porter, P., et al., 2011. Innovative education in agroecology: Experiential learning for a sustainable agriculture, *Crit.Rev.Plant Sci.*
- Francis, C. A., Porter, P., 2011. Ecology in sustainable agriculture practices and systems, *Crit.Rev.Plant Sci.*
- Lay, D. C., Fulton, R. M., Hester, P. Y., et al., 2011. Hen welfare in different housing systems, *Poult.Sci.*
- Leavitt, M. J., Sheaffer, C. C., Wyse, D. L. and Allan, D. L., 2011. Rolled winter rye and hairy vetch cover crops lower weed density but reduce vegetable yields in no-tillage organic production, *HortScience*.
- Yue, C., Dennis, J. H., Behe, B. K., Hall, C. R., Campbell, B. L. and Lopez, R. G., 2011. Investigating consumer preference for organic, local, or sustainable plants, *HortScience*.
- Yue, C., Tong, C., 2011. Consumer preferences and willingness to pay for existing and new apple varieties: Evidence from apple tasting choice experiments, *HortTechnology*.
- Coulter, J. A., Sheaffer, C. C., Wyse, D. L., et al., 2011. Agronomic performance of cropping systems with contrasting crop rotations and external inputs, *Agron.J.*
- Delbridge, T. A., Coulter, J. A., King, R. P. and Sheaffer, C. C., 2010. A Profitability and Risk Analysis of Organic and High-Input Cropping Systems in Southwestern Minnesota, *Agricultural and Applied Economics Association*.
- Moncada, Kristine M., Sheaffer, Craig C., 2010. Risk Management Guide for Organic Producers, *University of Minnesota*.
- Wortman, S. E., Lindquist, J. L., Haar, M. J. and Francis, C. A., 2010. Increased weed diversity, density and above-ground biomass in long-term organic crop rotations, *Renewable Agriculture and Food Systems*.

- Yue, C., Grebitus, C., Bruhn, M. and Jensen, H. H., 2010. Marketing organic and conventional potatoes in Germany, *Journal of International Food and Agribusiness Marketing*.
- Kandel, H. J., Porter, P. M. and Carr, P. M., 2009. Spring Wheat Cultivar Harrowing Evaluation in Minnesota, *Crop Management*.
- Schurman, R., Munro, W., 2009. Targeting capital: a cultural economy approach to understanding the efficacy of two anti-genetic engineering movements, *American Journal of Sociology*.
- Van Waardhuizen, M. R., Peloquin, C. E. and Kokil, U., 2009. CropConnect: Enabling community supported agriculture, *Conference on Human Factors in Computing Systems – Proceedings*.
- Yue, C., Tong, C., 2009. Organic or local? investigating consumer preference for fresh produce using a choice experiment with real economic incentives, *HortScience*.
- Clapp, C. E., Shenker, M., Hayes, M. H. B., et al., 2008. Microsystems for rapid evaluation of plant growth response to organic amendments, *Soil Sci*.
- Fox, J. T., Reinstein, S., Jacob, M. E. and Nagaraja, T. G., 2008. Niche marketing production practices for beef cattle in the United States and prevalence of foodborne pathogens, *Foodborne Pathogens and Disease*.
- Jacob, J. P., Carter, C. A., 2008. Inclusion of buckwheat in organic broiler diets, *Journal of Applied Poultry Research*.
- Jacob, J. P., Levendoski, N. and Goldstein, W., 2008. Inclusion of high methionine corn in pullet diets, *Journal of Applied Poultry Research*.
- Jacob, J. P., Noll, S. L. and Brannon, J. A., 2008. Comparison of metabolic energy content of organic cereal grains for chickens and turkeys, *Journal of Applied Poultry Research*.
- Kandel, H. J., Porter, P. M., Carr, P. M. and Zwinger, S. F., 2008. Producer participatory spring wheat variety evaluation for organic systems in Minnesota and North Dakota, *Renewable Agriculture and Food Systems*.
- Lorenzana, R. E., Bernardo, R., 2008. Genetic correlation between corn performance in organic and conventional production systems, *Crop Sci*.
- Warnke, S. A., Chen, S., Wyse, D. L., Johnson, G. A. and Porter, P. M., 2008. Effect of rotation crops on hatch, viability and development of *Heterodera glycines*, *Nematology*.
- Mahoney, P. R., Olson, K. D., Porter, P. M., Huggins, D. R., Perillo, C. A. and Crookston, R. K., 2007. Profitability of organic cropping systems in southwestern Minnesota, *Organic Food*.

Rosen, C. J., Allan, D. L., 2007. Exploring the benefits of organic nutrient sources for crop production and soil quality, *HortTechnology*.

Ashling, J., Tchida, C., Markhart, A. H. and Porter, P., 2007. Origin of Cornercopia, the University of Minnesota Student Organic Farm, *Journal of Hunger and Environmental Nutrition*.

Cho, S., Fossler, C. P., Diez-Gonzalez, F., et al., 2007. Antimicrobial susceptibility of shiga toxin-producing *Escherichia coli* isolated from organic dairy farms, conventional dairy farms, and county fairs in Minnesota, *Foodborne Pathogens and Disease*.

Delserone, L. M., Bernholz, C. D., 2007. Tracking "organic" agricultural research in the United States, 1970-1989: What federal legislative and selected USDA-sponsored documents reveal, *J.Agric.Food Inf.*

Jacob, J. P., 2007. Nutrient content of organically grown feedstuffs, *Journal of Applied Poultry Research*.

Mitchell, A. E., Hong, Y. J., Koh, E., et al., 2007. Ten-year comparison of the influence of organic and conventional crop management practices on the content of flavonoids in tomatoes, *J.Agric.Food Chem.*

Russelle, M. P., Entz, M. H. and Franzluebbers, A. J., 2007. Reconsidering integrated crop-livestock systems in North America, *Agron.J.*

Mukherjee, A., Speh, D. and Diez-Gonzalez, F., 2007. Association of farm management practices with risk of *Escherichia coli* contamination in pre-harvest produce grown in Minnesota and Wisconsin, *Int.J.Food Microbiol.*

Oquist, K. A., Strock, J. S. and Mulla, D. J., 2007. Influence of alternative and conventional farming practices on subsurface drainage and water quality, *J.Environ.Qual.*

Brunetti, G., Plaza, C., Clapp, C. E. and Senesi, N., 2007. Compositional and functional features of humic acids from organic amendments and amended soils in Minnesota, USA, *Soil Biol.Biochem.*

Carr, P. M., Kandel, H. J., Porter, P. M., Horsley, R. D. and Zwinger, S. F., 2006. Wheat cultivar performance on certified organic fields in Minnesota and North Dakota, *Crop Sci.*

Chen, S., Wyse, D. L., Johnson, G. A., et al., 2006. Effect of cover crops alfalfa, red clover, and perennial ryegrass on soybean cyst nematode population and soybean and corn yields in Minnesota, *Crop Sci.*

Cho, S., Bender, J. B., Diez-Gonzalez, F., et al., 2006. Prevalence and characterization of *Escherichia coli* O157 isolates from Minnesota dairy farms and county fairs, *J.Food Protection*.

- Cho, S., Diez-Gonzalez, F., Fossler, C. P., et al., 2006. Prevalence of shiga toxin-encoding bacteria and shiga toxin-producing *Escherichia coli* isolates from dairy farms and county fairs, *Vet.Microbiol.*
- De Bruin, J. L., Jordan, N. R., Porter, P. M. and Huerd, S. C., 2006. Soil microbiota effects on rye growth: Implications for integration of a rye cover crop into temperature cropping systems, *Renewable Agriculture and Food Systems.*
- Halbert, L. W., Kaneene, J. B., Linz, J., et al., 2006. Genetic mechanisms contributing to reduced tetracycline susceptibility of *Campylobacter* isolated from organic and conventional dairy farms in the Midwestern and Northeastern United States, *J.Food Protection.*
- Halbert, L. W., Kaneene, J. B., Ruegg, P. L., et al., 2006. Evaluation of antimicrobial susceptibility patterns in *Campylobacter spp* isolated from dairy cattle and farms managed organically and conventionally in the midwestern and northeastern United States, *J.Am.Vet.Med.Assoc.*
- Markhart, A. H., 2006. Organic educational opportunities at the University of Minnesota: The role of a student-run organic farm, *HortTechnology.*
- Ray, K. A., Warnick, L. D., Mitchell, R. M., et al., 2006. Antimicrobial susceptibility of *Salmonella* from organic and conventional dairy farms, *J.Dairy Sci.*
- Mukherjee, A., Speh, D., Jones, A. T., Buesing, K. M. and Diez-Gonzalez, F., 2006. Longitudinal microbiological survey of fresh produce grown by farmers in the upper Midwest, *J.Food Protection.*
- Schurman, R., Munro, W., 2006. Ideas, thinkers, and social networks: The process of grievance construction in the anti-genetic engineering movement, *Theory and Society.*
- Oquist, K. A., Strock, J. S. and Mulla, D. J., 2006. Influence of alternative and conventional management practices on soil physical and hydraulic properties, *Vadose Zone Journal.*
- Singer, R. S., Hofacre, C. L., 2006. Potential impacts of antibiotic use in poultry production, *Avian Dis.*
- Singer, R. S., Ward, M. P. and Maldonado, G., 2006. Can landscape ecology untangle the complexity of antibiotic resistance? *Nature Reviews Microbiology.*
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- Fossler, C. P., Wells, S. J., Kaneene, J. B., et al., 2005. Cattle and environmental sample-level factors associated with the presence of *Salmonella* in a multi-state study of conventional and organic dairy farms, *Prev.Vet.Med.*
- Griggs, J. P., Jacob, J. P., 2005. Alternatives to antibiotics for organic poultry production, *Journal of Applied Poultry Research.*
- Grossman, J. M., Sheaffer, C., Wyse, D. and Graham, P. H., 2005. Characterization of slow-growing root nodule bacteria from *Inga oerstediana* in organic coffee agroecosystems in Chiapas, Mexico, *Appl.Soil Ecol.*
- Kumar, K., Gupta, S. C., Baidoo, S. K., Chander, Y. and Rosen, C. J., 2005. Antibiotic uptake by plants from soil fertilized with animal manure, *J.Environ.Qual.*
- Vatovec, C., Jordan, N. and Huerd, S., 2005. Responsiveness of certain agronomic weed species to arbuscular mycorrhizal fungi, *Renew.Agric.Food Syst.*
- Ferris, H., Venette, R. C. and Scow, K. M., 2004. Soil management to enhance bacterivore and fungivore nematode populations and their nitrogen mineralisation function, *Appl.Soil Ecol.*
- Fossler, C. P., Wells, S. J., Kaneene, J. B., et al., 2004. Prevalence of *Salmonella spp* on conventional and organic dairy farms, *J.Am.Vet.Med.Assoc.*
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- Zwald, AG, Ruegg, PL, Kaneene, JB, et al., 2004. Management practices and reported antimicrobial usage on conventional and organic dairy farms, *J.Dairy Sci.*
- Francis, C., Lieblein, G., Gliessman, S., et al., 2003. Agroecology: The ecology of food systems, *J.Sustainable Agric.*
- Grossman, JM., 2003. Exploring farmer knowledge of soil processes in organic coffee systems of Chiapas, Mexico, *Geoderma.*
- Porter, P. M., Huggins, D. R., Perillo, C. A., Quiring, S. R. and Crookston, R. K., 2003. Organic and other management strategies with two- and four-year crop rotations in Minnesota, *Agron.J.*

Robinson, R., Smith, C., 2003. Associations between self-reported health conscious consumerism, body-mass index, and attitudes about sustainably produced foods, *Agriculture and Human Values*.

Wheatley, W. P., 2003. The natural and organic pork market: A sustainable niche for small-scale producers? A review and analysis of the evidence, *Am.J.Alternative Agric.*

Robinson, R., Smith, C., Murray, H. and Ennis, J., 2002. Promotion of sustainably produced foods: Customer response in Minnesota grocery stores, *Am.J.Alternative Agric.*

Extension and Outreach Publications

[ABCs of Organic Certification Webinar](#)

[An Introduction to Organic Certification Requirements](#)

[Approved Health Care and Medication Regulations for Organic Dairy and Livestock in the United States](#)

[Becoming a Certified Organic Dairy](#)

[Benefits and Challenges of Organic Certification for Research Sites and Facilities](#)

[Breeder Stock Regulations for Organic Dairy and Livestock in the United States](#)

[Can I Use This Input on My Organic Farm?](#)

[Directory of Minnesota Organic Farms 2012-2013 \(MDA\)](#)

[Farmers' Guide to Organic Contracts \(FLAG\)](#)

[Flooding and Organic Certification Webinar](#)

[GMO Contamination Prevention – What Does It Take?](#)

[Greenbook 2012 \(MDA\)](#)

[Minnesota Guide to Organic Certification](#)

[National Organic Program Summary](#)

[National Organic Program: What Agricultural Professionals Need to Know](#)

[Organic Certification of Research Sites and Facilities Webinar](#)

[Organic Certification of Vegetable Operations](#)

[Organic Certification Resources](#)

[Organic Dairy Certification: Why, How, and What?](#)

[Organic Farming Financial Benchmarks Webinar by eOrganic](#)

[Organic Farm Performance in Minnesota – 2011 \(MDA\)](#)

[Organic Food and Agriculture Research - 2011](#)

[Organic Production in High Tunnels](#)

[Organic System Plan Overview](#)

[Profiles in Sustainable Agriculture](#)

[Requirements for Organic Dairy and Livestock in the United States](#)

[Requirements for Organic Poultry Production](#)

[Risk Management Guide for Organic Producers](#)

[Safety Assessment of Genetically Engineered Foods: US Policy & Current Science](#)

[Status of Organic In Minnesota – 2010 \(MDA\)](#)

[SWROC High Tunnel: First Season Review and Lessons](#)

[Extending the Season for Organic Vegetable Production: Year Two Report](#)

[What is Organic Farming?](#)

[What is Organic Food and Why Should I Care?](#)

[What Makes a Farm Organic?](#)
[Why Eat Organic](#)

Additional organic extension and outreach publications are listed on the UMN Organic Ecology [Publications](#) page. The Minnesota Department of Agriculture has published additional [reports and fact sheets](#) on organic production, certification and marketing.

Academic Curricula

The UMN offers a Graduate Minor Degree in [Sustainable Agricultural Systems](#) and a [Sustainability Studies Minor](#) and is in the process of developing a major in Sustainable and Organic Food Systems. To support the new major, two new faculty positions are being developed - Assistant Professor –Sustainable & Organic Horticultural Food Production Systems and Assistant Professor – Biological Principles of Sustainable & Organic Food Systems. Current course include:

AGRO 3131/5131 - Student Organic Farm Planning, Growing and Marketing
AGRO 4888 - Issues in Sustainable Agriculture
HORT 2031 - Organic Food: How to Grow It, Where to Buy It, Can it Feed the World?
HORT 4000 - International Experiences in Horticultural Science: Successful School Gardens
HORT 5031 - Organic Viticulture and Fruit Production
HORT 5032 - Organic Vegetable Production

In addition to the course listed above, the University of Minnesota-Duluth offers a [Sustainable Food Systems Online Noncredit Certificate](#).

Minnesota State – Fergus Falls offers a degree in [Sustainable Food Production](#).

Graduate Student Opportunities

The UMN offers many graduate student organic research opportunities in agronomy, animal science, applied economics, horticulture, and soils and climate, depending on the interests of the grad students and their advisors. As part of the sustainable ag graduate minor, the following courses are required:

- SAGR 8010. Colloquium in Sustainable Agriculture
- SAGR 8020. Field Experience in Sustainable Agriculture
- AGRO/ENT 5321. Ecology of Agricultural Systems

Numerous [elective graduate courses](#) are also offered.

Outreach Efforts

The UMN SWROC hosts annual [Organic Field Days](#) near Lamberton, MN. The SWROC also hosts [Season Extension Days](#), focused on organic high tunnel production.

The [WCROC Organic Dairy Day](#) was first held in 2012. It is planned to be an annual event.

The UMN Center for Farm Financial Management and the UMN College of Food, Agricultural and Natural Resource Sciences partner with the Minnesota Department of Agriculture and the Minnesota State Colleges and Universities to provide scholarships to organic and transitioning farmers to enroll in [Farm Business Management](#) courses.

The [Minnesota Institute for Sustainable Agriculture](#) (MISA) brings together the diverse interests of the agricultural community with interests from across the University in a cooperative effort to develop and promote sustainable agriculture in Minnesota and beyond. MISA sponsors the SUSTAG and Healthy Foods Debate listserves and, along with the MN Department of Agriculture, co-sponsors the MN Organic Network listserve.

The [Minnesota Organic Advisory Task Force](#) advises the Commissioner of Agriculture and the University of Minnesota on policies and programs that will improve organic agriculture in Minnesota, including how available resources can most effectively be used for outreach, education, research, and technical assistance that meet the needs of Minnesota's organic agriculture community.

Minnesota Department of Agriculture operates the [Sustainable Agriculture Demonstration Grant Program](#), under which competitive grants for up to \$25,000 are awarded to individuals or groups for on-farm sustainable agriculture research or demonstration projects in Minnesota. Research reports are published in the annual [Greenbooks](#).

The [Sustainable Agriculture Project](#) at the University of Minnesota, Duluth formed in 2009 to institute education, research, and community engagement around local food systems and food security in the western Lake Superior region. A number of sustainable agriculture [courses and workshops](#) are offered.

Web Resources

[Elwell Agroecology Farm](#)

[Farmers' Guide to Organic Contracts \(FLAG\)](#)

[Minnesota Institute for Sustainable Agriculture](#)

[Minnesota Memorandum of Understanding on Organic Agriculture](#)

[Tools for Transition](#)

[UMN Organic Dairying](#)

[UMN Organic Ecology](#)

[UMN Library RefShare](#) (organic research publications)

[UMN Student Organic Farm](#)

[Video - UMN WCROC Organic Dairy](#)

[Video – What Is Organic?](#)

[Minnesota Department of Agriculture Organic Program](#)

Hands-on Learning

The Student Organic Farm, [Cornercopia](#), has 2.34 acres of certified organic land in the heart of the St. Paul campus field plots. Cornercopia is an organic farm that provides students hands-on whole farm learning opportunities, food for the local community and a place for community building, multi-disciplinary education, research and outreach. Cornercopia

grows over 80 different fruit, vegetable, flower, herb and nut crops all of which are marketed on campus. Cornercopia hosts student and faculty research projects through the Johnson Research Internship, the Undergraduate Research Opportunities Program and as requested.

Faculty and staff from the UMN take an active role in the annual [Minnesota Organic Conference](#), which is organized by the Minnesota Department of Agriculture.

Acres Certified Organic

At the Southwest Research and Outreach Center (SWROC) near Lamberton, MN, there are 121 acres of certified organic land used for multiple organic research projects. In addition, at the SWROC, there are:

- a. 40 acres in non-certified organic and non-organic plots, the Long-term Variable Input Crop Management Systems trial initiated in 1989;
- b. 3- 30 x 48 foot high tunnel hoop houses designed for advanced extended season certified organic vegetable production research and demonstration; and
- c. Several studies funded by USDA and CERES on advanced organic production practices including alternatives to corn and soybean, Canada thistle control, sweet sorghum, brassica and winter rye cover crops, weed control in flax, spring and winter peas, lentils, alfalfa mulch, popcorn, dry beans, alfalfa management. (Some of these also involve farm cooperators.)

At the West Central Research and Outreach Center (WCROC) near Morris, MN, there are 174.5 acres of certified organic cropland, 106.7 acres in transition; and 383.4 acres of certified organic pasture. The total certified and transitional land at the WCROC is 664.6 acres.

On the St. Paul campus, there are 2.34 acres certified organic.

Total UMN acres certified, managed organically, or in transition = 827.94 acres.

Organic Livestock Research

At the UMN WCROC, there are 97 certified organic cows and 100 conventional cows.

Genetic composition of the organic herd is 40% Holstein and 60% crossbreds consisting of Holstein, Jersey, Swedish Red, Montbeliarde, and Normande. During the spring of 2013, 26 heifers will be added to the organic herd, for around 125 in the organic herd. The conventional herd will grow to about 135. (Calves from both herds are being raised organically.)

Key Contacts

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Missouri

Organic Research Projects

The University of Missouri has not formerly been a leader in organic farming research, but an effort is currently underway to change that. A core group of researchers and extension educators at MU have begun to actively seek funding for organic research, to conduct train-the-trainer workshops in organics, to engage Missouri's organic farming community, and to provide outreach and networking opportunities for organic growers. In addition to the research listed below, Dr. Mary Hendrickson provides educational opportunities for students in the Department of Rural Sociology Sustainable Ag Program.

Current and recent organic research includes:

Evaluation of Soil Quality in Vegetables Planted in Plastic Mulch vs. No-Till in Polyculture Cover Crop, Tim Reinbott, 2012-2015, Funding: The Ceres Trust.

Optimizing Trap Cropping Systems for Key Insect Pests and Enhancing Beneficial Anthropods in Cucurbit Crops, Jaime Pinero, Lincoln University, 2012-2015, Funding: The Ceres Trust.

System Strategies for Weed Control and Soil Building during the Transition Years to Organic Production, Tim Reinbott, 2011-2014, Funding: The Ceres Trust.

Identification of Factors Affecting Carbon Sequestration and Nitrous Oxide Emission in Three Organic Cropping Systems, Timothy Reinbott, Kerry Clark, Robert Kremer, Newell Kitchen, Debi Kelly, 2011-2014, Funding: USDA-NIFA.

Formulating a Beneficial Organic Chicken Feed to Produce Soy-Free and Corn-Free Eggs, Jeri Villarreal, Villarreal Family Farm, LLC, 2012, Funding: SARE.

Comparative Analysis of Unpasteurized Organic Milk vs. Organic Fish Emulsion and Kelp as an Organic Fertilizer for Livestock Forages, Tom Colonna, Organian Farms LLC, 2012, Funding: SARE.

[Soil Microbial Response to Seven Different Organic Transition Strategies](#), Kerry Clark, MU, 2012. Funding: SARE.

[Educating from Seed To Market: An Organic Farming Apprenticeship Program in St. Louis, Missouri.](#) Molly Rockamann, 2009, Funding: SARE.

[Potential of Heritage Wheat Varieties for Use on Organic Farms: A Variety Trial and Market Survey.](#) Carrie Read, 2008, Funding: SARE.

[Demonstrating Organic Wild Crop Utilization and Certification as a Profitable Model for Enhancing Overall Farm Sustainability in the Missouri Ozarks.](#) Penny Frazier, 2007. Funding: SARE.

[Designing a Small-Scale Organic Agaricus Mushroom Production System to Provide Additional Income to Family Farms.](#) Bob Semyck, 2006. Funding: SARE.

[Organic Integrated Pest Management in High Tunnel Vegetable, Small Fruit, and Flower Production.](#) James Quinn, MU, 2004. Funding: SARE.

[Fulfilling a Market Niche, Organically.](#) Drew Kimmell, Missouri Northern Pecan Growers LLC, 2003, Funding: SARE.

Winter Rye Cover Crop in Organic Soybean Production in NE MO, Kelly Nelson, Reid Smeda, Randall Smoot, 2002-2003, Funding: Internal and Missouri Soybean Merchandising Council.

Refereed Publications

Kremer, R.J. and R.D. Kussman. 2011. Soil quality in a pecan-kura clover alley cropping system in the Midwestern USA. *Agroforestry Systems*.

Nelson, K.A., R.J. Smeda, and R.L. Smoot. 2011. Spring-interseeded winter rye seeding rates influence weed control and organic soybean yield. *Int. J. Agron.* [doi:10.1155/2011/571973.](#)

Pengthamkeerati, P., P.P. Motavalli, and R.J. Kremer. 2011. Soil microbial activity and functional diversity changed by compaction, poultry litter and cropping in a claypan soil. *Appl. Soil Ecol.* 48:71-80.

Pengthamkeerati, P., P.P. Motavalli, and R.J. Kremer. 2011. Soil microbial biomass nitrogen and β -glucosaminidase activity response to surface compaction and poultry-litter application in a claypan soil. *Appl. Soil Ecol.* 51:79-86.

Earlywine, D.T., R.J. Smeda, T.C. Teuton, C.E. Sams and X. Xiong. 2010. Evaluation of oriental mustard (*Brassica juncea* L. Czern.) seed meal for weed suppression in turf. *Weed Technol.* 24:440-445.

Kremer, R. J. and M. Ben-Hammouda. 2009. Allelopathic Plants: 19. *Hordeum vulgare* L. *Allelopathy Journal* 24:225-242.

Kremer, R.J. and J. Li. 2003. Developing weed-suppressive soils through improved soil quality management. *Soil Till. Res.* 72:193-202.

Over the next three years, MU is expected to publish an additional 10-12 research papers in organic farming.

Extension and Outreach Publications

[Growing and Marketing Elderberries in Missouri](#)

[Making and Using Compost](#)

[Natural Lawn Care](#)

[Organic Vegetable Gardening Techniques](#)

[The Berry Basket](#)

[Weeding With Geese](#)

Academic Curricula

MU offers a Bachelors of Science in Agriculture with [Emphasis in Sustainable Agriculture](#). This curriculum requires courses in Soils, Agronomy, Community Development, and Sustainable Economics, including:

- ▲ AFNR 2215: Introduction to the Theory and Practices of Sustainable Agriculture
- ▲ AFNR 3215: Community Food Systems
- ▲ SOIL 2100: Introduction to Soil
- ▲ AG EC 3241: Ethics in Agriculture
- ▲ BIOCHM 2112: Biotechnology in Society
- ▲ PLNT SC 1125: People Plants and the Environment
- ▲ PLNT SC 2110: Plant Growth and Culture
- ▲ PLNT SC 2075: Environmental Horticulture
- ▲ AN SCI 2165: Introduction to Ruminant Livestock Production
- ▲ AN SCI 2175: Introduction to Monogastric Production

Graduate Student Opportunities

Graduate students are involved in organic research projects in the Department of Soil and Atmospheric Science with Dr. Robert Kremer and Dr. Newell Kitchen. Graduate student projects with an agronomic emphasis are completed at the Bradford Research Center. There are currently two PhD students and one MS student in organic farming research.

There are also graduate student opportunities in organic research in Ag Econ with Dr. Ray Massey and in Rural Sociology with Dr. Mary Hendrickson.

MU has been seeking funding for two graduate student opportunities with Dr. Reid Smeda, in weed science. Dr. Smeda has conducted research in the past on weed control in organic agriculture. An OREI grant proposal was recommended for funding in 2012, but was not high enough on the list to receive funds.

Outreach Efforts

In 2013 and 2014, Organic Field Days will be conducted on organic row crop production at the Bradford Research Center and at the farm of a cooperating organic grain producer.

In 2013, MU researchers will talk on organic research findings at the [Missouri Organic Association Annual Conference](#) and will conduct tests at the conference for active soil carbon from soil samples submitted by organic producers.

September-November, 2012, approximately 5000 schoolchildren were given tours at Bradford Research Center, including information on organic agriculture.

September 2012, Advanced Soil Health Train-the-Trainer Workshop for over 75 NRCS and Extension educators - discussion of MU organic research and methods of combining cover crops, no-till and organic agriculture.

August 2012. Missouri Beginning Farmer Program Workshop on Integrated Pest Management with an Emphasis on Organic Practices. Two-day workshop with farm tour that attracted 20 participants. Workshop conducted at Lincoln University's Urban Impact Center in Kansas City.

August 2012. Missouri Beginning Farmer Program Workshop on Integrated Pest Management with an Emphasis on Organic Practices. Two-day workshop with farm tour that attracted 20 participants. Workshop conducted at University of Missouri's Southwest Research Center.

August 2012, State Soil Scientists Work Planning Meeting-Included an informational talk on organic research at MU.

July 2012. Missouri Beginning Farmer Program Workshop on Integrated Pest Management with an Emphasis on Organic Practices. Two-day workshop with farm tour that attracted 20 participants. Workshop conducted at Lincoln University's Carver Farm.

July 2012. Missouri Beginning Farmer Program Workshop on Integrated Pest Management with an Emphasis on Organic Practices. Two-day workshop with farm tour that attracted 10 participants. Workshop conducted at Warren County Extension Center.

July 2012, Crop Injury and Diagnosis Clinic - Included an informational talk on organic research and cover crops.

April 2012. Missouri Beginning Farmer Program Webinars (webinars held for farmers presented by farmers). Held 3 webinars on Organic Agriculture by Liz Graznak, Happy Hollow Farm.

March 2012, MU Extension Cover Crop Focus Team meeting including NRCS and producers at MU Bradford Research Center for over 30 people. Included tours of cover crops and roller crimper demonstration.

February 2012, Missouri Organic Association Conference, Tim Reinbott led a discussion on organic research at MU.

November 2011. Missouri Beginning Farmer Program Workshop on Introduction to Organic Vegetable Production. Two-day workshop with farm tour that attracted 20 participants (workshop over-filled). Workshop conducted at the Jefferson County Extension Center.

September 2011, Organic Farming Systems, Part II Train-the-Trainer for over 65 NRCS, MU Extension and Lincoln University Extension at MU.

June 2011. Missouri Beginning Farmer Program Workshop on Organic Production. Two-day workshop with farm tour that attracted 30 participants (workshop over-filled). Workshop conducted at Bradford Research and Extension Center.

May 2011. Missouri Beginning Farmer Program Webinars (webinars held for farmers presented by researcher). Held 2 webinars on Introduction to Soil Management for Sustainable Farmers by Joel Gruver, Western Illinois University.

September 2010, Organic Farming Systems, Part I Train-the-Trainer for over 55 NRCS, MU Extension and Lincoln University Extension at MU.

Web Resources

[Ag Bulletin Board Organic Agriculture](#)
[Bradford Research and Extension Center](#)
[Center for Agroforestry at the University of Missouri](#)
[Columbia Center for Urban Agriculture](#)
[Lincoln University](#)
[Missouri Alternatives Center](#)
[Missouri Organic Association](#)
[Missouri State University – Mountain Grove](#)
[MU Southwest Center Agricultural Experiment Station](#)
MU hosts the Missouri Organic Association listserv.
Newsletter [Ag Opportunities](#)
[Organic Gardening in St. Louis](#)
Organic Research at MU [Greenley Research Center](#)
[SARE at MU](#)

In winter 2012-2013, an Organic Agriculture in Missouri webpage will be initiated at the Bradford Research Center website. This is part of the outreach for two organic cropping system grants. This webpage will present data from MU research projects, information on upcoming seminars, conferences and workshops, and links to Missouri resources in organic agriculture.

Hands-on Learning

The University of Missouri has an agricultural research farm in Mt. Vernon, MO, dedicated to innovative practices in sustainable agriculture, where students enrolled in the sustainable ag emphasis program can conduct research.

Otherwise, MU does not offer any direct hands-on learning opportunity such as a fully developed student farm. However, MU's Tigers for Community Agriculture, a project of one of the largest student groups on campus, Sustain Mizzou, offers three ways to be involved in hands-on production, some of which use organic practices: 1) Child Development Laboratory garden located on USDA-ARS plots at MU. Students work with pre-school children in a garden education program. 2) Student plots at Bradford Research and Extension Center. Students have organized production of cool-season vegetable crops for sale to Campus Dining and the University Club. Students have experimented with organic techniques next to conventional (yet sustainable) techniques. 3) Tiger Pantry community garden. Students have dedicated a plot from the Columbia Center for Urban Agriculture (CCUA) to production for the student-run food pantry on campus. CCUA promotes organic and sustainable production techniques to urban farmers and community gardeners within the city of Columbia.

Students have the option of interning with CCUA and commercial organic farmers as a capstone project for their BS in Sustainable Agriculture. Most current students opt for an internship rather than a capstone project. In addition, MU operates a study abroad program with E.A.R.T.H University in Costa Rica. At least three sustainable agriculture majors/minors have completed coursework in organic agriculture at E.A.R.T.H.

Acres Certified Organic

Currently there are 5 acres certified organic at Bradford Research Center and another 10 acres in transition. There are future plans to make an additional 15 acres organic.

Total acres certified, managed organically, in transition, or planned = 30

Organic Livestock Research

The organic study on sheep in the animal science department is utilizing 15 animals.

Key Contacts

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Debi Kelly, Missouri Alternatives Center - Missouri State Sustainable Agriculture Co-Coordinator, KellyD@missouri.edu

Dr. Jaime Pinero, Assistant Professor & State IPM Specialist, Lincoln University of MO, PineroJ@lincolnu.edu

Dr. Timothy M. Reinbott, Superintendent, Bradford Research & Extension Center, ReinbottT@missouri.edu

Nebraska

Organic Research Projects

The general areas where UNL conducts organic research include:

Nutrient management: Determine the effects of organic soil amendments, and interaction between general fertility levels and integrated weed control; assess nutrient balance on organic farms; raise knowledge in organic community of exported nutrients.

Weed management: Evaluate an integrated approach for weed control using mechanical methods and flame weeding.

Cover crops: Determine optimum selection of mixture, timing of planting, economics, incorporation methods, effects on crop yields, benefits to increase soil nutrient levels, organic matter, carbon, water-holding capacity, erosion prevention and microbial activity, increase species biodiversity, habitat for beneficial insects, and weed suppression.

Organic small grains breeding and systems development: Breed cultivars optimal to organic production for disease and pest resistance, response to fertilizers, and end-use quality.

Antioxidant production in organic small grains: Determine levels of antioxidant levels among wheat cultivars, and organic environments.

Biodiversity conservation on working organic farms: Quantify the effect of organic management of breeding bird populations, and institute long-term ecological monitoring.

Healthy Farm Index assessment of biodiversity indicators and land use patterns: Deliver a tool to organic farmers for farm assessment and structured decision making.

On-farm/farmer research capability: Provide guidance, encouragement, and technical support for organic farmers and research groups in Nebraska.

Specific research projects include:

Development of Cultural Practices to Use a Roller-Crimper in Cropping systems for Eastern Nebraska, Charles Shapiro, 2011-2014, Funding: The Ceres Trust.

Diverse Cover Crop Strategies for Improved Yield and Weed Suppression in Organic Cropping Systems for the Western Corn Belt, John L. Lindquist, 2011-2014, Funding: The Ceres Trust.

Investigating Nitrogen Use Efficiency for Winter Wheat Quality in Organic Rotations in Nebraska, P. Stephen Baenziger, 2011-2014, Funding: The Ceres Trust.

Bridging resources in agriculture, energy, health and nutrition; Hochunks developing a sustainable tomorrow, Quinn, B. K.; Campbell, C. L. (Little Priest Tribal College, Winnebago, NE), 2010-2013, Funding: USDA-NIFA.

[Avian Ecology](#) – Impacts of organic agriculture on wild bird populations. J. E. Quinn, J. R. Brandle, R. J. Johnson, Funding: USDA-IOP.

[Cover Crops](#) - Mulching Cover Crop Mixtures to Increase Weed Suppression, Soil Nitrogen Availability, Soil Moisture and Grain Yield, Sam E. Wortman, John L. Lindquist, Rhae A. Drijber, Mark L. Bernards and Charles A. Francis. 2011-2014, Funding: The Ceres Trust.

[Flaming: Potential tool for weed management](#), 2012, Funding: USDA and The Propane Education & Research Council (PERC).

[Healthy Farm Index](#) – Tools to assess agricultural sustainability, 2011-2013, Funding: USDA.

Improving Organic Farming Systems and Assessing their Environmental Impacts across Agroecoregions, Elizabeth Sarno, others, 2009-2012, Funding: USDA-OREI.

[Small Grains](#) - Developing small grains cultivars and systems optimally suited for organic production, Baenziger, P. S.; Shapiro, C. A.; Lyon, D. J.; Knezevic, S.; Russell, W. K.; Hein, G. L.; Wegulo, S. N.; Flores, R. A.; Schlegel, V. L.; Wehling, R. L., 2007-2011, Funding: USDA-NIFA.

[Organic Conservation Program Training for NRCS and Extension, Kathie Starkweather, Center for Rural Affairs, 2009. Funding: SARE.](#)

[Improving Organic Systems](#) - Improving Organic Systems Across Nebraska Agroecosystems, 2005-2010, Funding: USDA-NIFA.

[Soil fertility and weed management in long-term conventional and organic crop rotations](#), Charles Francis, UNL, 2008. Funding: SARE.

[Growing Organic Strawberries with the Help of Fabric](#), Libby Fulton, 2008, Funding: SARE.

Advantages and disadvantages on an organic corn crop from 25 tons of cattle manure per acre, Robert Hrnchir, 2007. Funding: SARE.

[Training for Organic Farming and Ranching in the Great Plains, Charles Francis, UNL, 2006, Funding: SARE.](#)

[Organic Grape Production](#), Tim Nissen, 2003, Funding: SARE.

[Yellow Dent Organic Hybrid Seed Corn](#), Michael Jasa, 2002, Funding: SARE.

Refereed Publications

Quinn, J.E., J. Brandle, and R. Johnson. (In Press). Grassland bird response to local and landscape land use and land cover patterns associated with organic farmland. *Agriculture, Ecosystems & Environment*.

Wortman, S. E., C. A. Francis, M. A. Bernards, E. E. Blankenship and J. L. Lindquist. 2013. Mechanical termination of diverse cover crop mixtures for improved weed suppression in organic cropping systems. *Weed Science* 61:162-170.

Low, David, 2012, [Mechanical termination of diverse cover crop mixtures for improved weed suppression in organic cropping systems](#) [WeedsNews3611](#)

Quinn, J.E., J. Brandle, and R. Johnson. 2012. The effects of land sparing and wildlife-friendly practices on grassland bird abundance within organic farmlands. *Agriculture Ecosystems, & Environment*. 161:10-16.

Quinn, J.E., J. Brandle, and R. Johnson. 2012. A farm-scale biodiversity and ecosystem services assessment tool: The Healthy Farm Index. *International Journal of Agricultural Sustainability* DOI:10.1080/14735903.2012.726854.

Quinn, J.E. 2012. [A shared vision for biodiversity conservation and agriculture](#). *Renewable Agriculture and Food Systems*. doi:10.1017/S1742170512000154

Brubaker, Corey, Elizabeth Sarno, Sam Wortman, and Karla Jenkins. 2012. Cooperative Effort to Promote Cover Crop Usage in Nebraska. *Agronomy Abstracts*. 375-21.

Johnson, R.J., Jedlicka, J.A., Quinn, J.E., Brandle, J.R. 2011. [Global perspectives on birds in agricultural landscapes](#). Pages 55-140 in: Campbell WB, Ortiz SL (editors) Issues in agroecology; present status and future prospectus, volume 1, *Integrating Agriculture, Conservation and Ecotourism: Examples from the Field*. Springer ([Abstract and figures](#))

Ulloa, S. M., Datta, A., Bruening, C., Neilson, B., Miller, J., Gogos, G., Knezevic, S. Z. 2011. Weed control & crop tolerance to propane flaming as influenced by the time of day. *Crop Protection* 13:1-7.

Quinn, J.E., J. Brandle, R. Johnson, and A. Tyre. 2011. Accounting for detectability in the use and application of indicator species: A case study with birds. *Ecological Indicators* 11:1413-1418.

Johnson, R.J., J.A. Jedlicka, J.E. Quinn, J.R. Brandle 2011. Global perspectives on birds in agricultural landscapes. Pages 55-140 in: Campbell W.B., Ortiz S.L. (editors) Issues in agroecology - present status and future prospectus, volume 1, *Integrating Agriculture, Conservation and Ecotourism: Examples from the Field*. Springer.

Quinn, J.E., J.R. Brandle, and R.J. Johnson. 2011. Avian conservation in temperate agroecosystems: consideration of spatial scale and management outcomes. Paper presented at the AFO/COS/WOS Joint Meeting Kearney, NE.

Quinn, J.E., J.R. Brandle, and R.J. Johnson. 2011. Communicating the complexity of biodiversity associated with agroecosystems. Poster presented at the AESS Annual Meeting. Burlington, VT.

Ahrens, D., R. Zbasnik, R. Little, P.S. Baenziger, T. Regassa, and V. Schlegel. 2011. Effects of different Nebraska agro-eco environments on the polyphenols present in organically grown wheat cultivars. 2011 MOSES Conference, LaCrosse, WI.

Santra, S., Richard Little, Peter Baenziger, Teshome Regassa, Ibrahim Salah, Meng Wang, Devin Rose, Lan Xu, Charles Shapiro, Michael Mainz, and Drew Lyon. 2011. Developing small grains cultivars and systems optimally suited for organic production. *Agronomy Abstracts*. 91-11.

Sarno, Elizabeth, Charles Shapiro, Charles Wortmann, James Brandle, Ron Johnson, Drew Lyon, John Quinn, Dipak Santra, Richard Ferguson, Gary W. Hergert, Stevan Knezevic, George Gogos, Robert Wright, Charles Francis, Laurie Hodges, Peter Baenziger, Richard Little, Christopher Bruening, Vicki Schlegel, Teshome Regassa, Stephen Wegulo, Sam Wortman, David Glett, Katja Koehler-Cole and David Baltensperger. 2011. Development of the University of Nebraska Organic Farming Research Program. *Agronomy Abstracts*. 183-2.

Sarno, Elizabeth, Charles Wortmann, Charles Shapiro, James Schneider, Douglas Anderson, and Mark Hinze. 2011. On-farm farmer research for organic production in Nebraska. *Agronomy Abstracts*. 188-18.

Ahrens, D., V. Schlegel, R. Zbasnik, R. Little, P.S. Baenziger, R. Regassa. 2010. Effects of different Nebraska agri-eco environments on the polyphenols and their antioxidant capabilities of organically grown wheat. Poster presented at the seminar Undergraduate Creative Activities and Research Experiences (UCARE). University of Nebraska-Lincoln.

Bruening C. A., G. Gogos, S.M. Ulloa, S. Z. Knezevic. 2010. Performance advantages of flaming hood. *Weed Research* (In Preparation).

Bruening C. A., G. Gogos, S.M. Ulloa, S. Z. Knezevic. 2010. Field performance of flaming hood vs open torch. *Weed Research* (In Preparation).

Quinn J. E. 2010. Assessment and communication of the value of biodiversity. PhD Dissertation, University of Nebraska-Lincoln, USA.

Quinn, J.E., J.R. Brandle, and R.J. Johnson. 2010. Avian response to land use and land cover patterns associated with organic farm systems. Poster presented at the COS/AOU/SCO Joint Meeting San Diego, CA.

Shapiro, C. A., et al. 2010. Organic farming in Nebraska: establishing organic research for the organic farming community. Presented at the Crop Production Clinics throughout Nebraska. In the *Proceedings of the Crop Production Clinics*, pp. 183-185. University of Nebraska-Lincoln.

- Ulloa S. M., A. Datta, S. Z. Knezevic, C. A. Bruening, G. Gogos, T. J. Arkebauer. 2010. Time of day impacts the level of weed control and crop tolerance to propane flaming. *Weed Science* (In Preparation).
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- Ulloa, S. M., A. Datta, S. D. Cavalieri, M. Lesnik, S. Z. Knezevic. 2010. Popcorn (*Zea mays* L. var. *everta*) yield and yield components as influenced by the timing of broadcast flaming. *Crop Protection* doi: 10.1016/j.cropro.2010.08.011.
- Ulloa, S. M., A. Datta, G. Malidza, R. Leskovsek, S. Z. Knezevic. 2010. Yield and yield components of soybean [*Glycine max* (L.) Merr.] are influenced by the timing of broadcast flaming. *Field Crops Research* doi: 10.1016/j.fcr.2010.08.006.
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Ulloa, S. M., A. Datta, S. Z. Knezevic. 2008. Winter wheat tolerance to broadcast flaming. In *Proceedings of the North Central Weed Science Society Conference*, Indianapolis, Indiana, USA, 63:109.

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Knezevic, S. Z., S. M. Ulloa. 2007. Weed tolerance to flaming. In *Proceedings of the North Central Weed Science Society Conference*, St Louis, Missouri, 62:9.

Knezevic, S. Z., Ulloa, S. M. 2007. Crop tolerance to flaming. In *Proceedings of the North Central Weed Science Society Conference*, St Louis, Missouri, 62:138.

Quinn, J.E., J.R. Brandle, and R.J. Johnson. 2007. Avian Abundance and Diversity in Organic Agricultural Landscapes: An Ecological Indicator for a Healthy Farm Index. Poster presented at the University Of Nebraska School Of Natural Resources Research Colloquium. Lincoln, Nebraska.

Quinn, J.E., J.R. Brandle, R.J. Johnson. 2007. Avian Abundance and Diversity in Organic Agricultural Landscapes: An Ecological Indicator for a Healthy Farm Index. Poster presented at the University of Nebraska School of Natural Resources Research Colloquium. Lincoln, Nebraska.

Extension and Outreach Publications

[Breeding for Organic Systems](#) – Organic wheat variety trial results

[Buyers for Organic Products](#)

[Buying Organic: Resources for Consumers in Nebraska](#)

[Certification Process for Organic Production](#)

[Developing an Individual Farm Organic System Plan](#)

[How can I market my Organic Products?](#)

[Long-Term Rotation Experiment Evaluates Organic and Conventional Cropping](#)

[_____ Systems in Nebraska](#) (webinar)

[Multifunctional Rural Landscapes](#)

[Organic Resources: Support, Education, Research](#)

[Organic Gardening: Market and Home](#)

[Science-Based Organic Farming 2008: Toward Local and Secure Food Systems](#)

[Service Manuals & Training Guides for using a Flamer for weed control](#)

[The Contribution of Organic Farmland to Great Plains Bird Conservation](#)

[Transitioning to Organic Farming](#)

[University of Nebraska–Lincoln Organic Farming Research](#)

Academic Curricula

UNL offers an [Organic Systems Option](#) for Agronomy and Horticulture undergraduate majors.

Classes directly related to organic production include:

AGRO/HORT 439/839 Organic Farming & Food Systems, Spring Semester, 3 credits; invited speakers include specialists in organic certification, organic farmers, and academics with practical experience in hoop houses, vegetable production, and marketing; field trip to local organic farm

AGRO/HORT/NRES 435/835 Agroecology, Spring Semester, 3 credits; agroecology is the ecology of food systems, and a systems-oriented course that deals with production, economics, environmental impacts, and social viability of alternative farming systems, including organic systems as one key option for Nebraska farmers

AGRO/HORT 496, 1-6 credits: Internships in agriculture and food systems and this allows students to gain academic credits while conducting a structured work and learning experience on farms, including organic farms.

UNL also offers a five-part mini-course series called "[Science-based Organic Farming](#)," with the following classes:

- Overview of Organic Farming
- Organic Farming Systems
- Current Issues in Organic Farming
- Organic Vegetable Production
- Marketing Organic Products

Graduate Student Opportunities

The programs described in the UNL [Graduate Areas of Study](#) show no listings for organic or sustainable agriculture graduate degrees. However, organic-related graduate student opportunities may be arranged, depending on the interests of the grad students and their advisors. Examples of current and recent research on organic systems: cover crop mixtures in three-year crop rotation; soil fertility aspects of long-term animal based and legumes based four-year rotations; flame weeding alternatives for row crops; breeding cultivars for organic systems and weed management in organic systems.

Outreach Efforts

In recent years, UNL Extension has organized and/or participated in a number of organic outreach events, including:

[Breeding and growing organic wheat for bread](#) (2006-2012)

[The Rural Advantage/Healthy Farms Conference](#)

[Western Sustainable Ag Crops and Livestock Conference](#) (2006-2012)

Birding on the Farm tours at Grain Place Foods, Common Good, and Sunset Farms.

Grain Place Foods in Marquette, NE, has a farm tour in July and the UNL-OWG has been invited to speak every year. (2006-2012)

[Nebraska Sustainable Agriculture Society \(NSAS\) Healthy Farms conference](#)

Summer organic farm tours with Bruno/Abie cooperating farmers – demo flamer, crop rotations, cover crops, livestock etc.

Listservs: Organic Research Group (farmers/researchers), Cover Crop Research (organic and conventional farmers/researchers), Organic (researchers and collaborators) and the NSAS (general public, farmers)

Web Resources

[Avian Ecology](#)

[Center for Applied Rural Innovations](#)

[Center for Rural Affairs](#)

[CropWatch Organic](#)

[Healthy Farm Index](#)

[Nebraska Sustainable Agriculture Society](#)

[OCIA International](#)

[Sensitive Crop Locator](#)

[UNL Organic Working Group](#)

[Weed Flaming](#)

Hands-on Learning

UNL does not have a student organic farm at this time, but undergrads and graduate students can conduct research at one of the certified organic research farms. UNL conducts workshops and farm tours to work directly with farmers on organic budgets, using the Healthy Farm Index to evaluate their farms.

Acres Certified Organic

Organic crop research is being conducted on certified organic land in three of the four Nebraska ecoregions (Western High Plains, Central Great Plains, Nebraska Sandhills, Western Corn Belt) at four agricultural field laboratories across the state:

ARDC, Mead – 51 acres

Haskell Ag Lab, Concord - 33.81 acres

South Central Ag Lab, Clay Center - 21.7 acres

High Plains Ag Lab, Sidney - 73.3 acres

Total acres certified, managed organically, or in transition = 179.81

Organic Livestock Research

None of the university farms are able to have a livestock component at this time. On-farm research projects are being planned to look at fly control in pasture situations for beef cattle.

Key Contacts

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Dr. Charles Shapiro, Professor, Agronomy and Horticulture, cshapiro@unl.edu

North Dakota

Organic Research Projects

Current and recent organic research includes:

Developing “Organic-Ready” Maize Populations with Gametophytic Incompatibility Years 1 & 2, Frank Kutka, 2011-2012, Funding: Organic Farming Research Foundation and Cliff Bar Family Foundation.

Dry Pea Breeding for Organic Production, Kevin McPhee. 2012, Funding: Internal Sources.

Using Ecological Principles to Manage Weeds in Organic Farming Systems, Greta Gramig, 2012, Funding: Internal Sources.

Small Grain Breeding For Organic Systems – Oats, Mike McMullen, 2012, Funding: Internal Sources.

Organic Farming: The Search for Agricultural Sustainability in the northern Great Plains (ND 06258), Patrick M. Carr (PI), 2007-2013. This project guides organic farming research directed out of the NDSU Dickinson Research Extension Center from 2007 through 2013. Funded research under this project umbrella includes:

- Targeted grazing as a keystone ecological process to reduce tillage intensity and terminate cover crops. Environmental, ecological, and economical assessment of reintegrating animal and crop production in dryland organic systems. F. Menalled (PC), P. Hatfield, P. Carr, P. Miller, D. Weaver, M. Burrows, R. Engel, A. Bekkerman, J. Boles, Z. Miller, R. Quinn, L. Burkle, K. O’Neill, G. Gramig, and K. Ringwall (Co-PIs). Funding: USDA-NIFA OREI.
- Increasing Varietal Suitability and Availability of Cowpea and Forage Radish Cover Crop Seed for Northern Climates. K. Stroh (PC), S. Zwinger, T. Podoll, P. Carr, P. Sexton, E. Silva, J. Fuhrer, and E. Steigelmeier (Co-PIs). 2009, Funding: USDA-SARE.
- Organic crop variety selection for Great Plains States in the North Central Region. P.M. Carr (P.I.), G. Gramig, D. Hines, F. Kutka, Y. Lawley, K. McPhee, and S. Zwinger (Co-PIs). Funding: The Ceres Trust.
- Cover crop selection and use in organic no-till farming. P.M. Carr (P.I.), K. Delate (Co-PI), M. Haar (Co-PI), and E. Silva (Co-PI). Funding: USDA-SARE.
- Developing carbon-positive organic systems through reduced tillage and cover crop-intensive crop rotation schemes. K. Delate (P.I), C. Cambardella, P. Carr, M.

- Haar, J. Moyer, D. Mutch, E. Silva, S. Weyers (Co-PI). 2008-2012, Funding: USDA-CSREES-IOP.
- Variety screening for organic vegetable production. E.M. Silva (P.I.) and P.M. Carr (Co-PI). 2008, Funding: Organic Valley - Farmers Advocating for Organic.

[Multi-Species Cover Crops Control Weeds and Improve Fertility in Organic No-Till Fields,](#) Linda Grotberg, Prairie Farm Pilot Project, 2010, Funding: SARE.

[Screening Open-Pollinated Vegetable Varieties Bred and Released In North Dakota for Suitability to Organic Production Systems and Local Markets,](#) Marvin Baker
North Star Farms, 2009, Funding: SARE.

Reducing the Impact of Soybean Aphid on Organic Soybeans through Multiple Management Tactics. Mark Askegaard, 2009, Funding: SARE.

[Organic No-Till- The Ultimate Cropping System For Soil Health and Farm Sustainability,](#) Linda Grotberg, 2008, Funding: SARE.

Building Organic Soil Health with Green Manure and Cover Crops, Pat Frank, 2008, Funding: SARE.

[Is It Possible? Can We Have Organic Sustainable Agriculture with Minimal Tillage while Soil Building and Producing High Quality Forage for Grass-Fed Beef,](#) Anne Ongstad, Whitman Ranch, 2007, Funding: SARE.

[Prairie Farm Pilot Project - Transitioning from Conventional to Organic Farming,](#) Richard Grotberg, 2006, Funding: SARE.

[Organic Education: Increasing Opportunities for Farmers and Processors,](#) Britt Jacobson, FARRMS, 2006, Funding: SARE.

[Bringing Small-Grain Variety Development and Selection onto Organic Farms,](#) Patrick Carr, NDSU, 2002, Funding: SARE.

Refereed Publications

Carr, P.M., K. Delate, X. Zhao, C.A. Cambardella, J.R. Heckman, and P.L. Carr. 2012. [Organic farming: Impacts on soil, food, and human health.](#) In E.C. Brevik and L. Burgess (ed.) *Soils and Human Health*. Taylor and Francis Group (*in press*)

Prischmann-Voldseth, D., G. Gramig, and E. Burns. 2012. Home on the range: establishment of a Canada thistle biocontrol agent. *Rangelands* (*in press*)

Carr, P.M., R.L. Anderson, Y.F. Lawley, P.R. Miller, and S.F. Zwinger. 2012. [Organic zero-till in the northern U.S. Great Plains region: Opportunities and obstacles.](#) *Renewable Agriculture and Food Systems* 27:12-20.

Carr, P.M., P. Mäder, and N.G. Creamer. 2012. Editorial. [Overview and comparison of conservation tillage practices and organic farming in Europe and North America](#). *Renewable Agriculture and Food Systems* 27:2-6.

Kandel, H.J., P.M. Porter, and P.M. Carr. 2009. Spring wheat cultivar harrowing evaluation in Minnesota. *Crop Management* doi:10.1994/CM-2009-0612-02-RS.

Kandel, H.J., P.M. Porter, P.M. Carr, and S.F. Zwinger. 2008. [Producer participatory spring wheat variety evaluation for organic systems in Minnesota and North Dakota](#). *J. Renewable Agric. Food Sys.* 23:228-234.

Extension and Outreach Publications

[Long-Term Organic and Tillage Study \(LOTS\)](#)

[NPSAS Farmer-Breeder Club Report](#)

[Organic Crop Cultivar Selection for Great Plains States in the North Central Region](#)

[Organic Farming Gaining Ground But Beware](#)

[Organic Farming, Is It for Me?](#)

[Organic Farming: The Search for Agricultural Sustainability in the Northern Great Plains](#)

[Organic Gardening 101](#)

[Organic Gardening Tips](#)

[Organic No Till Using the Cover Crop Roller](#)

[Projected 2010 Organic Crop Budgets South Central North Dakota.](#)

[Projected 2007 Organic Crop Budgets South Central North Dakota.](#)

[Status of Organic Agriculture in North Dakota - 2005](#)

[Suggested Best Practices for the Coexistence of Organic, Biotech and Conventional Crop Production Systems](#)

[2008 Evaluation of Seed Source in Organic Potato Production](#)

[2012 Trial Results - Emmer - Organic - Carrington](#)

Academic Curricula

No organic agriculture classes are currently offered.

Graduate Student Opportunities

Dr. Greta Gramig is directing an M.S. student (Aman Amand) on a pea competition study with field experiments in certified organic fields. Drs. Kevin McPhee and Patrick Carr are members on the graduate committee, along with others.

Outreach Efforts

The Dickinson Research Extension Center has hosted two organic field days - one in [2009](#) and one in [2012](#). Both were well attended (>200 at the 2009 event and >80 at the 2012 event). The Carrington field day had an organic farming morning tour offering as part of their field day, which also was well attended. An on-farm field day was conducted at Richardton, ND (23 miles east of Dickinson) in 2004.

Selected presentations by Dr. Pat Carr include:

Two symposia at the 2010 American Society of Agronomy's international meeting – one on organic no-till and one on organic grain production. Papers presented during the organic no-till symposium subsequently were published in the winter issue (volume 27) of *Renewable Agriculture and Food Systems*.

Presentations focused on cover crops when working with organic farmers in 2012.

In-service organic production training to new Extension Educators in 2012.

Using ecological principles to manage weeds in organic farming systems, 11 July, Dickinson Research Extension Center, and 17 July, 2012, Carrington Research Extension Center.

Organic Agronomic Research at the DREC, Field day for Montana County Extension Agents, 2012, Dickinson.

State of Organic Research and Education at NDSU, and What Have We Dreamed?, Carrington Research Extension Center annual field day, 17 July, 2012, Carrington

Our Goal is OZ: Organic Zero-Till, Dickinson Research Extension Center annual field day, 11 July, 2012, Dickinson

Organic No-till and Cover Crop Cocktails: What do we know and what is there left to learn? Annual education session, OCIA ND Chapter 2 meeting, Bismarck Public Library, February 18, 2012, Bismarck.

Variety Selection for Organic Environments. Northern Plains Sustainable Agriculture Society 2012 Healthy Soil – Healthy You Winter Conference, 27-28 January, 2012, Ramkota Hotel and Conference Center, Aberdeen, SD.

Organic No-Till: What's Been Learned and Where are We Headed? Northern Plains Sustainable Agriculture Society 2012 Healthy Soil – Healthy You Winter Conference, 27-28 January, 2012, Ramkota Hotel and Conference Center, Aberdeen, SD.

Zero-till (OZ) in Organic Production. How to avoid tilling the soil without chemicals, Sustainable U., December 4, 2010, Radisson Hotel, Bismarck, ND.

The Real Dirt on Soil Health and Organic Farming, Soil Health/Soil Biology Training for the Northern Great Plains, June 15-16 (Pierre, SD), June 17-18 (Mitchell, SD), June 28-29 (Carrington, ND), and June 30-31, 2010 (Bismarck, ND).

Organic Production Systems in the Northern Great Plains: Challenges and Opportunities, North Dakota Soil and Water Summit 3, July 2010, Chieftain Hotel, Carrington, ND.

Organic Zero-Till in the Great Plains, FARRMS Organic Production NRCS Workshop, July (Fargo), August (Bismarck), and August (Minot), 2010.

Organic No-Till: Experiences from North Dakota to Wisconsin, 9th Annual Iowa Organic Conference, December 2009, Scheman Building, Ames, IA.

Organic farming research in North Dakota, AERO Summer Farm Tour, Quinn Farm, Big Sandy, MT, July 2009.

Organic farming research at NDSU, Inaugural North Dakota State University Organic Farming Field Day, Dickinson Research Extension Center, North Dakota, July 2009.

How to ZT and organic farm on the Great Plains, Manitoba Ag Days, January 2009, Keystone Center Complex, Brandon, Manitoba.

Organic weed control systems in crops and rangeland, North Dakota Weed Control Association Annual Meeting, February 2009, Mandan.

Cover crops research, 25th Annual Western Dakota Crops Day, December 2008, Hettinger Armory, Hettinger.

No-Till Organic Farming: Fact or Fiction? Department of Plant Sciences Seminar, North Dakota State University, Fargo, ND, December 5, 2008.

Roller/crimper demonstration, Forage Beef and Cover Crop Workshop, September 2008, DREC ranch location.

Rolling and crimping cover crops, Kentucky SCD Tour Group, September 2008, DREC ranch location.

Organic No-Till Roller/Crimper Demonstration, Organic Field Day, July 2008, University of Minnesota Southwest Research and Outreach Center, Lamberton, MN.

Killing Cover Crops with the Roller Crimper, Summer Field Tour, 2008, Dickinson.

Emerging Organic No-Till Strategies, FARRMS No-Till Workshop, March 2008, Medina.

Organic No-Till in North Dakota: Opportunities and Challenges, New York Certified Organic Discussion, February 2008, IVN Classroom, DREC.

Why Organic Farming? Extension Service Pre-Conference Training, Winter Annual Conference, Northern Plains Sustainable Agriculture Society, 2008, Mandan, ND.

Organic Farming Research and Ley Farming, 24th annual Western Dakota Crops Day, 2007, Hettinger Armory, Hettinger.

Perspectives in Sustainable Agriculture, Sustainable Agriculture Seminar, 2007, North Central Research Extension Center, Minot.

Organic Farming: Search for Agricultural Sustainability in the Buffalo Commons. Invited Scientist seminar, USDA-ARS North Central Soil Conservation Research Laboratory, Morris, MN. 2007.

Web Resources

[Carrington Research Extension Center](#)

[Dickinson Research Extension Center](#)

[Dickinson Research and Extension Center Organic Field Day 2012 video](#)

The [NDSU Library](#) provides access to books, journals, databases, websites, organizations and more on organic agriculture.

[North Dakota Department of Agriculture Organic Farming](#)

[North Dakota Organic Advisory Board](#)

[North Dakota Organic Online Directory](#)

[Northern Plains Sustainable Agriculture Society](#)

[NPSAS Farmer-Breeder Club](#)

[Tool to Connect ND Organic Producers and Buyers](#)

Hands-on Learning

No student organic farm.

Acres Certified Organic

26 acres at the [Dickinson Research Extension Center](#) and 4 acres at the [Carrington Research Extension Center](#) are certified organic (through ICS and OCIA); additional land is rented on certified organic farms, as needed.

Total acres certified, managed organically, or in transition = 30

Organic Livestock Research

None at this time.

Key Contacts

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Ohio

Organic Research Projects

Founded in 1998 as an interdisciplinary research and extension team at the Ohio Agricultural Research and Development Center (OARDC), the Organic Food and Farming Education Research (OFFER) program has grown in parallel with the organic industry over the past 14 years. The program underwent a leadership transition late in 2011, when Deb Stinner, the first leader of the program, retired from OARDC. The new director, Brian McSpadden Gardener, had been actively involved with the program and organic research and education since joining Ohio State in 2001. Since his appointment, he has strengthened connections with stakeholders and expanded its programming. An external advisory committee meets twice annually with the Director to discuss programming and stakeholder issues, and they serve as resources to connect researchers to growers and others in the organic industry. The OFFER group's web site (<http://oardc.osu.edu/offer/pageview/Home.htm>) is currently being updated, but provides an overview of the mission and research of program members.

Currently, the Ohio State University's College of Food, Agriculture, and Environmental Sciences employs over forty faculty who are involved in organic research, education, and extension activities. Included in the current OFFER members (see http://oardc.osu.edu/offer/pageview/Staff_and_Partners.htm), are members of every Department in the College as well as the Glenn School of Public Policy). These faculty members are currently working on research projects funded by a variety of sources, including AFRI, NIFA's OREI and ORG programs, SARE, as well as The Ceres Trust. Several members have also received OFRF funding in the past.

OFFER faculty are currently engaged in a number of funded research projects, most of which are listed (<http://oardc.osu.edu/offer/pageview/Research.htm>). Details of these projects can be gleaned from the USDA's CRIS system. The focus and emphasis of OFFER research programs are responsive to the needs of growers but constrained by funding priorities of the different agencies and stakeholders that support them. As a rule, few of the OFFER faculty work exclusively on organic research topics, however, all are committed to the same sustainability and environmental principles that are at the core of the organic movement. And, all are responsive to organic stakeholders.

Going forward, the program has plans to catalog all past projects and related outputs as a permanent record of its accomplishments. For now, the internal reporting systems at OSU and CRIS system were used to assemble the following information.

Current and recent organic farming related research projects include:

Agronomic/Field Crops

Providing scientific support for organic agriculture, [Phelan, P. L.](#), [Doohan, D. J.](#), and [Loerch, S. C.](#), 2012-2015, Funding: USDA-NIFA.

Assessing, modeling, and maximizing ecosystem services in long-term organic and transitioning farming systems, [Grewal, P. S.](#), [Islam, K. R.](#), [McCoy, E. L.](#), [Kumarappan, S.](#), and Sundermeier, A. 2012-2015, Funding: USDA-NIFA Organic Transitions.

Maximizing ecosystem services of the soil food web in organic farming systems, Parwinder S. Grewal, 2011-2014, Funding: The Ceres Trust.

Strengthening public corn breeding to ensure organic farmers' access to elite cultivars, [Scott, P.](#) (ARS), 2010-2014, Funding: USDA-NIFA.

Ecosystem based weed management: giant ragweed in the corn belt, [Regnier, E. E.](#), [Stoltenberg, D.](#), and Mahoney, K., 2010-2013, Funding: USDA-NIFA-AFRI.

Optimizing organic soil fertility management to improve the crop health and baking functionality of organic Midwestern spelt, Larry Phelan, 2009-2012, Funding: The Ceres Trust.

Environmental sustainability of organic farming systems: on-farm, experimental, and watershed assessments, [Shipitalo, M.](#), [Stinner, D.](#), and [Bonta, J.](#) (ARS), 2010-2011, Funding: USDA-OREI Planning Grant.

[Guiding CRP Landowners into Sustainable Organic Production in the North Central Region](#), Ernest Martin, 2008, Funding: SARE.

[Sustainable Concrete Post Construction for Fencing and Trellising of Organic Crops](#), Steve Pearce, 2007, Funding: SARE.

[Growing Organics: Integrating Science, Farmer Indigenous Knowledge, and Experience in Expanding Organic Production in Ohio](#), Mike Anderson, OEFFA, 2007, Funding: SARE.

[Evaluating Corn Varieties in Pure and Mixed Stands for Organic Crop Production across Three States in the Corn Belt](#), Peter Thomison, OSU, 2006, Funding: SARE.

[Weed Management in Organic Conservation Tillage/No Tillage](#), John Cardina, OSU, 2004, Funding: SARE.

Vegetable & Fruit Crops

Enhancing productivity and soilborne disease control in intensive organic vegetable production with mixed-species green manures, [McSpadden Gardener, B. B.](#), [Miller, S. A.](#), [Kleinhenz, M.](#), [Everts, K.](#), [Meyer, S.](#), [Norton, G.](#), [Parmeter, C.](#), and Smart, C., 2009-2013, Funding: USDA NIFA-Organic Research Extension Initiative

Renewable mulches for integrated weed management in small-scale crop production, [Regnier, E. E.](#), [Harrison, S. K.](#), [Metzger, J. D.](#), and Bennett, M. A., 2009-2012, Funding: USDA-NIFA.

Mental models and participatory research to redesign extension programming for organic weed management, [Doohan, D. J.](#), [Ernst, S.](#), [Wilson, R.](#), [Stinner, D.](#), [Parker, J.](#), [Tucker, M.](#), [Gibson, K.](#), [Smith, R.](#), [Gallandt, E.](#), and Riemens, M., 2009-2013, Funding: USDA NIFA-Organic Research Extension Initiative.

Developing cultural practices for organically grown medicinal plants, John Cardina, 2008-2011, Funding: The Ceres Trust.

Developing Organic Management to Restore Soil Quality for Food Production in Degraded Urban Soils, Joshua Beniston, (Rattan Lai, Major Professor), 2010, Funding: Ceres Trust Graduate Student Grant.

[Organic Control of Fungus in Vineyards, Eliminating Chemical Sprays](#), Steve Pearce, 2006, Funding: SARE.

[Organic Production and Marketing of Forest Medicinals: Building and Supporting a Learning Community Among Growers](#), Dennis Hosack, Rural Action, 2005, Funding: SARE.

[Organic Food Trail](#), Tim Patrick, 2004, Funding: SARE.

[Variety Evaluation, Selection and Management for Organics Vegetable Systems](#), Matthew Kleinhenz, OSU, 2003, Funding: SARE.

Livestock

Whole farm approach incorporating pasture raised organic poultry and a novel cereal grain (naked oats) into an organic rotation, [Lilburn, M. S.](#), [Phelan, L.](#), [Batte, M.](#), and Mariola, M., 2011-2015, Funding: USDA NIFA-Organic Research Extension Initiative.

Impact of organic animal production systems on water quality and quantity in Ohio - an integrated research, extension and education program, [Loerch, S. C.](#), [Moore, R.](#), [Taylor, R.](#), [Stinner, D.](#), [McCutcheon, J.](#), [Bonta, J.](#), and [Owens, L.](#) 2009-2103, Funding: USDA-NIFA-IOWQP.

Effect of intrauterine dextrose on dairy cows with clinical metritis in organic dairy herds. Schuenemann, G.M and G.M. Maquivar. 2012-2013. USDA – Animal Health/FF.

Impact of alternative endometritis therapy on fertility of lactating dairy cows, [Schuenemann, G.](#), [Daniels, J.](#), and Pinto, C., 2009-2010, Funding: USDA - Animal Health/FF.

[Comparing Antimicrobial Usage in Commercially-Raised and Organically-Raised Chickens and Turkeys and the Development of Antimicrobial Resistance in *Campylobacter jejuni*](#), Taradon Luangtongkum, OSU, 2003, Funding: SARE.

Marketing & Economics

Organic food marketing: panacea or problem?, [Haab, T. C.](#) and [Hooker, N. H.](#) 2008-2012, Funding: NRI Competitive Grant.

US Organic Food and Beverage Innovations: Trends 2009-2010. (DiMarcello, Nicholas and **Neal H. Hooker**). 2011. *HSB Working Paper*. 11-1. Available online: <http://www.sju.edu/academics/hsb/resources/workingpapers/> Funding: Internal - Saint Joseph's University Haub School of Business.

Assessing the communication needs of Ohio's organic farmers, Agunga, R. A., Igodan, C., 2004-2010, Funding: USDA-NIFA.

Paths of transition: strategies for peri-urban organic farmers, Kleinhenz, M. D.; Mcspadden, B. G.; Cardina, J.; Miller, S. A.; Batte, M.; Grewal, P.; Stinner, D., 2002-2007, Funding: USDA-NIFA.

Revitalizing small and mid-sized farms: organic research, education, and extension, Miller, S. A.; Stinner, D. H.; Moore, R.; Cardina, J.; Hoy, C., 2000-2005, Funding: USDA-NIFA.

Soils

Increasing the services of soil invertebrates in agroecosystems, C.W. Hoy & P. S. Grewal,

2009-2012, Funding: USDA-NIFA.

Maximizing ecosystem services of the soil food web in organic farming systems, P. S. Grewal and R. R. Islam, 2012-2014, Funding: The Ceres Trust.

Transition strategies that control perennial weeds and build soil, Cardina, J.; Felix, J.; Doohan, D.; Stinner, D.; Batte, M., 2006-2009, Funding: USDA-NIFA.

Biological buffering and pest management in organic farming systems: the central role of organic matter, Stinner, D.; Phelan, P. L., 2003-2008, Funding: USDA-NIFA.

Carbon sequestration and carbon and nitrogen cycling processes in organic agricultural ecosystems, Stinner, D.; Hatcher, P. G., 2002-2006, Funding: USDA-NIFA.

Refereed Publications

OFFER researchers publish a variety of articles, many of which are not specific to organic agriculture. Examples of recent organic-related publications include:

DeLeon, Lauren and Neal H. Hooker. 2012. Trends in US Organic Food and Drink Product Introductions. *John Glenn School of Public Affairs Working Paper*. Available online: <http://glenn.osu.edu/research/workingpapers> November. 13 pp

Grewal, P.S. 2012. Entomopathogenic nematodes as tools in integrated pest management. In: *Integrated Pest Management: Principles and Practice* (D. P. Abrol, Ed.), CABI Publishing, Wallingford, UK, 162-236.

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Extension and Outreach Publications

The Extension programs at The Ohio State University serve diverse constituencies, including transitioning and certified organic growers. OFFER researchers provide multiple presentations to growers on organic research projects during the year through their regular outreach programming, often giving handouts as part of their presentations. [Ohioline](#) (the main outlet for Extension materials in Ohio) lists publications for organic farmers by entering “organic farming” or “organic agriculture” as [search](#) terms. These include bulletins and fact sheets on a wide variety of topics. Examples include:

[Armyworm in Organic Corn](#)
[Biopesticide Controls of Plant Diseases: Resources and Products for Organic Farmers in Ohio](#)
[Enhancing Wildlife Habitat on Farmlands](#)
[Inoculants and Soil Amendments for Organic Growers](#)
[Managing Downy Mildew in Organic and Conventional Vine Crops](#)
[Microbial Biopesticides for the Control of Plant Diseases in Organic Farming](#)
[Ohio Organic Producers: Final Survey Results](#)
[The Organic Certification Process for Crops](#)
[Sustainable Agriculture Fact Sheet Index](#) (numerous fact sheets)
[Sustainable Agriculture Resources](#)

Several OFFER faculty members are active members in [eOrganic](#) communities of practice. OFFER personnel (e.g. Francis, McSpadden Gardener, Miller, Zwicke) have led several webinars on eOrganic, and numerous fact sheets have been posted to that web site. OFFER views eOrganic as a major outlet for extension and educational materials.

Academic Curricula

There is a [Sustainable Agriculture](#) major at OSU's [Agricultural Technical Institute](#) (an Associates degree granting program), which includes an Organic farming course, and there is an effort to establish a new undergraduate degree in Sustainable Agriculture with a minor in Organic agriculture, but this is not yet in place.

Currently the agriculture curriculum at The Ohio State University is organized largely by specialty, and these are largely defined within Departments. Sustainability is a major theme that is emphasized throughout the curriculum, and discussions of organic agriculture take place in the curriculum of all CFAES majors. However, there are not specific “organic farming” courses at OSU. Topics related to organic disease and pest management, for example, are taught within courses on disease and pest management more broadly.

Graduate Student Opportunities

Graduate research programs largely mirror departments within the College of Food, Agriculture, and Environmental Sciences (<http://cfaes.osu.edu>), though the Environmental Graduate Studies program is trans-collegiate. OFFER researchers and their graduate students typically conduct their work within the context of their disciplinary Department, but are often engaged in interdisciplinary research related to organic agriculture as indicated by the mix of principal investigators on the projects listed above.

Outreach Efforts

Field days have been presented at the OARDC's Wooster and Findlay locations on a nearly annual basis. Research extension personnel have been involved in programming specific to organic researchers at multiple locations on an annual basis. Partnerships with the Ohio Ecological Food and Farming Association (Ohio's main organic certifier and organic stakeholder organization) have led to multiple presentations by OSU faculty at [OEFFA's](#)

[annual Organic Farming Conference](#), as well as sponsored workshops and training sessions. In total, approximately two dozen presentations are given annually that focus specifically on organic farming issues around the state. Additionally, OFFER researchers have made a concerted effort to distribute their expertise to a national (and international) audience through materials posted to eOrganic. Locally, OFFER is now sponsoring twice-yearly programs in Wooster and Columbus on varying topics to further connect researchers and stakeholders.

A symposium on the [“Future Directions for Organic Agriculture Research”](#) was held at OSU on November 1, 2012. Speakers from OTA, OFRF, PASA, and OEFFA were included.

Web Resources

The OFFER program maintains a web site (<http://oardc.osu.edu/offer/pageview/Home.htm>) with links for researchers and farmers. It was substantially updated in 2012 and will be further refined in 2013 such that a historical record of program activities will be properly archived.

Additional web resources about organic production in Ohio include:

[Ohio Ecological Food and Farm Association](#)
[Small Farm New Farm Internet Resources](#)

Hands-on Learning

Information on the OSU student farm can be found at <http://studentfarm.wordpress.com> as well as on Facebook <https://www.facebook.com/ohiostatestudentfarm>. [Internship and employment](#) opportunities are offered. Additionally inquiries can be sent to Mark Bennett, who supervises student farm activities.

Acres Certified Organic

OSU operates more than 50 acres of certified organic research land on four research farms (Fry Farm/Wooster; West and East Badger/Apple Creek; Hirzel/Findlay). An additional 10 acres of land are in transition. These farms are able to handle both agronomic and horticultural crops (particularly field vegetables). Recent research has also involved use for sheep and chicken pasturing with certain rotations.

Total acres certified, managed organically, or in transition = 60

Organic Livestock Research

Currently funded research projects involve organic sheep grazing (Francis Fluharty), poultry (Mark Lilburn), dairy management (Steve Loerch) and dairy cow health management (Gustavo Schueneman). Animals are managed organically on station and some projects involve working directly on-farm with producers. More information can be obtained on these projects from the principal investigators listed above.

Key Contacts

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Complete list of [OFFER Research & Extension Personnel](#)

South Dakota

Organic Research Projects

SDSU has trials on winter wheat variety evaluations, and hoped to have some on flame weeding trials in 2012, but with the drought that didn't work out. In 2013, SDSU intends to start work on flaming for weed control, with a new graduate student who will start fieldwork in the spring,

[Sustainable organic tribal bison production system](#), Scott Fausti, SDSU Economics Dept., Flandreau Santee Sioux tribe, 2012, Funding: USDA-OREI.

Optimizing sorghum-sudan/forage soybean cover crop populations and screening sorghum varieties for organic cover crop performance, forage, and seed production in the Northern Great Plains region. Ray Berry, 2010, Funding: SARE.

Corn breeding and sustainability, Wicks, Z. W., SDSU, 2003-2008, Funding: USDA-NIFA.

[Strengthening Grazing Success Through Genetics with Flax in an Organic Environment](#), Angela Jackson-Pridie, 2005, Funding: SARE.

Agriculture: Natural resources outreach education program, Melvin, M. (Oglala Lakota College, Kyle, SD), 2001-2005, Funding: USDA-NIFA.

Refereed Publications

None found specific to organic production.

Extension and Outreach Publications

SDSU Extension publications on organic production include:

[Organic Agriculture Addressed by SDSU IPM Program](#)

[Organic Beef Production Costs \(ppt\)](#)

[Organic Fruit and Vegetable Producers Are Eligible for Certification Reimbursement](#)

[Organic Production: Practices and Prevalence](#)

[What Does “Organic” Mean to a SD Fruit or Vegetable Grower?](#)

Most of SDSU Extension’s publications, applicable to organic production, focus on Integrated Pest Management. Those found at <http://www.sdstate.edu/ps/extension/ipm/ipm-pubs.cfm> include:

[Can Fire Be Used to Control Saltcedar in Northern Grasslands?](#)

[Do fire and grazing management provide opportunities for saltcedar invasion by allowing increased establishment from seed?](#)

[Managing Change in Crop Production: Integrated Pest Management](#)

[Managing Change in Crop Production: Integrated Pest Management Thresholds](#)

[Managing Change in Crop Production: Management Consultants](#)

[Biocontrol Insects of Canada Thistle in the Northern Great Plains](#)

[A Guide to the Common Native and Exotic Thistles of South Dakota](#)

[I.P.M. Strategies for Grasshopper Control in South Dakota](#)

[Biocontrol of Noxious Weeds in South Dakota](#)

[Managing Leafy Spurge Flea Beetle Releases in South Dakota](#)

[Leafy Spurge Flea Beetle Collection Recommendations](#)

[Saltcedar: An Environmental Threat](#)

[Yellow and Dalmation Toadflax](#)

[Purple Loosestrife and Invasive European Common Reed: Threats to South Dakota’s](#)

[Wetlands and Waterways](#)

Academic Curricula

Kimberly James offers a vegetable production course that includes an organic component. SDSU has an Agroecology course that is taught in the Plant Science Department - this is not specifically organic, but tries to take an ecological view on crop production.

Graduate Student Opportunities

SDSU offers an Agroecology specialization in the Masters in Plant Science program.

Outreach Efforts

SDSU has a summer field day focusing on organic production at Beresford in August, and hosts a [conference](#) for organic producers in Sioux Falls in the first week of December. The 2-day conference, organized by SDSU faculty and staff, has tracks on organic crop,

livestock, and vegetable production. SDSU has done both the last two years and intends to make them annual events.

In addition, SDSU Extension provided a half-day [CSA Mini-School](#) after the 2012 organic conference, and designed and delivered a [webinar series](#) for people interested in establishing school gardens.

There was an [SDSU Southeast Research Farm Organic Plot Tour](#) in August 2011.

In 2010, SDSU Extension, along with USDA-IPM/SARE & SDSU-IPM, held a 2-day event, the “[Western Corn Belt Conference for Organic Farmers](#)” in Sioux Falls.

Web Resources

A web search for “[organic farming](#)” at SDSU’s [Hilton M. Briggs Library](#) yields numerous relevant books on file.

[iGrow](#) is the platform used by SDSU Extension to provide web-based program and content delivery.

The South Dakota Department of Agriculture manages the [organic certification cost share program](#) in SD.

SDSU faculty and staff are involved in the [Dakota Local Food Network](#).

Hands-on Learning

There is presently no student organic farm, but graduate students are likely to conduct research on certified organic land at the Southeast Research Farm in Beresford, SD.

Acres Certified Organic

SDSU received certification for an organic research plot in 2012. It is a 4-acre block at the SDSU Southeast Research Farm in Beresford.

Total acres certified, managed organically, or in transition = 4

Organic Livestock Research

SDSU is conducting organic bison research in cooperation with Flandreau Santee Sioux tribe and Flandreau Indian School.

Key Contacts

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Darrell Deneke, SDSU IPM Coordinator, Darrell.Deneke@sdstate.edu

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Kimberly James, Instructor, Plant Science, kimberly.james@sdstate.edu

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Christina Zdorovtsov, Community Development Field Specialist, SDSU Extension,
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Wisconsin

Organic Research Projects

Carrot improvement for organic agriculture with added grower and consumer value, Philipp Simon, Erin Silva, Jed Colquhoun (in collaboration with Organic Seed Alliance, University of California, Purdue University and Washington State University). 2012-2016, Funding: USDA-OREI.

Quantifying Relationships Between Soil Quality, Soil Fertility, and Pasture Management and the Productivity of Organic Dairy Pastures and Milk Production, Mark Renz, 2012-2015, Funding: The Ceres Trust.

Optimizing No-Till Organic Production to Improve Soil Health and Management of Late-Season Weeds, Erin Silva, 2012-2015, Funding: The Ceres Trust.

Cover cropping strategies for small scale, urban organic farms: Erin Silva, Jed Colquhoun, and Anne Pfeiffer, 2011-2015, Funding: USDA-NIFA.

Crop plant nutrition and insect response in organic field crop production: linking farmer observation to university research and extension, Eileen Cullen, Kevin Shelley, Robin Mittenthal, Paul Whitaker, 2010-2014, Funding: USDA-OREI.

Strategies of pasture supplementation on organic and conventional grazing dairies: assessment of economic, production and environmental outcomes, Victor Cabrera, David Combs, Rhonda Gildersleeve, Michel Wattiaux, 2010-2014, Funding: USDA-NIFA-OREI.

Organic and sustainable experiential learning for beginning farmers, Pedretti, J. (MOSES), 2011-2014, Funding: USDA-NIFA.

Northern organic vegetable improvement cooperative (NOVIC), Erin Silva (in collaboration with North Dakota State University). 2009-2013, Funding: USDA-OREI.

Evaluation of organically approved fungicides for vegetable crops, Amanda Gevens, Josh Posner, Jon Baldock, John Hall. 2012-2013, Funding: USDA Hatch Formula Fund and Internal Sources.

Evaluation of organically approved pesticides for organic vegetable crops, Russell Groves, 2012-2013, Funding: Internal Sources.

On-farm research with organic graziers, Janet Hedtcke, Josh Posner, Altfrid Krusenbaum, Ken Nordlund, Gary Frank, Bob Van De Boom, 1990-2013, Funding: W.K. Kellogg Foundation; SARE; USDA-ARS; and USDA-Dairy Forage Research Center.

Organic and conventional production systems in the long-term Wisconsin Integrated Cropping Systems Trials: productivity, profitability and environmental impact, Janet Hedtcke, Dwight Mueller, Darwin Frye, Jean-Paul Chavas, 1990-2013, Funding: W.K. Kellogg Foundation; SARE; USDA-ARS; and USDA-Dairy Forage Research Center.

Increasing Varietal Suitability and Availability of Cowpea and Forage Radish Cover Crop Seed for Northern Climates, Erin Silva, 2012, Funding: SARE.

Weed and Fertility Interactions in Organic Vegetable Crops, A.J. Bussan, Matt Ruark, Jed Colquhoun, Erin Silva, 2012, Funding: UW Hatch Grant.

Developing farm financial knowledge of beginning and sustainable farmers, Padgham, J. L. (MOSES), 2009-2012, Funding: USDA-NIFA.

Veggie Compa\$\$: Whole farm planning for enhanced profitability of Midwestern organic vegetable growers, Erin Silva, Paul Mitchell, John Hendrickson, 2009-2012, Funding: The Ceres Trust.

Developing carbon-positive organic systems through reduced tillage and cover crop-intensive crop rotation schemes, Erin Silva (in collaboration with Iowa State, University of Minnesota, Michigan State and North Dakota State), 2008-2012, Funding: USDA-IOP.

Identifying Potato Varieties with Increased Levels of Mature Plant Resistance to Potato Virus Y for Improved Organic Seed Potato Production, Chen Zhang, (Russell Groves, Major Professor), 2012, Funding: Ceres Trust Graduate Student Grant.

Reducing risk associated with organic snap bean production in Wisconsin, James Nienhuis. 2011-2012, Funding: OFRF and Internal Sources.

Organic certified seed potato production in the Midwest, Amy Charkowski, Ruth Genger, Doug Rouse, Russell Groves, Shelley Jansky, 2009-2012, Funding: USDA-NIFA.

Development of tools and methods for non-invasively tracing the effects of conventional agricultural inputs and determine chemical fingerprints due to metabolic effects of GM alfalfa that could alter the health and productivity of dairy cows. UW Zoology, 2011, Funding: FAFO.

Develop a quantitative assessment to measure the health and genetic consequences of pesticide exposure. UW-Zoology, 2010, Funding: FAFO.

Fertility strategies for hoop house-grown organic raspberries, Rebecca Harbut, Jesse Dahir-Kanehl, 2012, Funding: UW College of Agricultural and Life Sciences Annual Fund.

Impact of organic management on dairy animal health and well-being, Pamela Ruegg, Linda Tikofsky, Ynte Schukken (Cornell University); Mike Gamroth (Oregon State University), 2008-2013, Funding: USDA-NIFA.

Determination of perceptions and use of organic seed and varieties by Midwestern organic vegetable growers, Alexandra Lyon, (Erin Silva, Major Professor), 2010, Funding: Ceres Trust Graduate Student Grant.

Utilizing phylloplanins for the control of fungal and oomycete pathogens in organic potato farming. Amy O. Charkowski, 2011, Funding: The Ceres Trust.

Organic seed potato production and participatory breeding, Amy O. Charkowski, 2011-2012, Funding: The Ceres Trust.

Identifying Heirloom and Specialty Varieties Resistant to Silver Scurf Disease for Organic Potato Production, Chadradhar Mattupalli, 2011, Funding: The Ceres Trust.

Benefits of Increasing Grazing Height on Weed Suppression in Management Intensive Rotational Grazing Systems in Wisconsin, Marie Schmidt, (Mark Renz, Major Professor), 2010, Funding: Ceres Trust Graduate Student Grant.

Reducing risk associated with organic snap bean production in Wisconsin, James Nienhuis, 2010, Funding: OFRF.

[Relationship between organic fertility management, plant nutrition, and insect response,](#) Robin Mittenthal, UW, 2009, Funding: SARE.

Cover crop selection and use in organic no-till farming, Erin Silva, 2009, Funding: SARE.

Midwest Breeding Project Aims for Cold-Tolerant Sweet Corn, William F. Tracy, 2008, Funding: OFRF.

Identify growth traits and field performance of vegetables grown in certified organic conditions, Erin Silva, 2008, Funding: FAFO.

Midwest Study Highlights Viability of Organic Certified Potato Seed Production, Amy Charkowski, 2008, Funding: OFRF.

Research the production of certified seed potatoes in the Midwest and how to control diseases in organic production, UW-Madison, 2008, Funding: FAFO.

[The Viability of Growing Organic Medicinal Herbs as Alternative Cash Crops for Wisconsin Farmers,](#) Brian Fontaine, 2007, Funding: SARE.

[Soil Fertility Strategies on Organic Vegetable Farms,](#) John Hendrickson, UW, 2005-2009, Funding: SARE.

[Establishing a Wisconsin Hatchery to Produce and Sell Organically Raised Pastured Poultry Chicks](#), Julia Maro, 2004, Funding: SARE.

[Developing the Upper Mississippi River Valley's Untapped Resource- Organic Maple Syrup](#), Eric Meyer, Organic Maple Cooperative , 2004, Funding: SARE.

[Socioeconomic Analysis of Organic, Grass-Based & Conventional Dairy Farmers in Wisconsin with Case Study in Amish Stewardship Practices in the Kickapoo Valley](#), Caroline Brock, UW, 2004, Funding: SARE.

[Microbial Inoculant Treatments as an Alternative Spray for Disease Control that Reduces the Toxicity and Use of Copper in Organic and Sustainable Viticulture](#), Patricia Iubelt, Maple Ridge Vineyards, 2003, Funding: SARE.

[The Use of Movable High Tunnels in the Organic Production of Strawberries, Potatoes, and Raspberries](#), Daniel Mielke, 2002, Funding: SARE.

Relationships between corn plants and nitrogen fixing bacteria on an organic farm. Carrie Young, (Michael Fields Agricultural Institute), 2009-2012, Funding: The Ceres Trust.

Developing high quality corn for sustainable farmers in the northern corn belt, Pollak L M; Goldstein W. (Michael Fields Agricultural Institute), 2008-2010, Funding: USDA.

Dr. Jason Mills at St. Norbert College in De Pere, WI, is conducting research on the impact of organic farms on biodiversity of wild areas.

Organic Valley, LaFarge WI, operates the [Farmers Advocating for Organics](#) (FAFO) grant program, which is open to applicants seeking funding for projects or programs that are oriented towards protecting, safeguarding, and advancing organic agriculture and organic marketplace through research, advocacy and/or education.

Refereed Publications

Examples of organic-related articles by UW faculty include:

Silva, Erin and Geraldine Muller. 2012. Creating a Collaborative, Hands-on Program to Teach High School Students Organic Farming: A Case-Study Partnership of a Land-Grant University and a Public School. Accepted to *HortTechnology*.

Silva, Erin. 2012. Management of five fall-sown cover crops for organic no-till production in the upper Midwest. Submitted to *Renewable Agriculture and Food Systems*.

Mattupalli, C., R. K. Genger, and A. O. Charkowski. 2012. *Helminthosporium solani* and *Colletotrichum coccodes* co-occurrence in organically grown asymptomatic and symptomatic potatoes. Submitted to *Plant Disease*.

Reilly, K., E. Cullen, T. Lola-Luz, D. Stone, J. Valverde, M. Gaffney, N. Brunton, J. Grant and BS Griffiths. 2012. Effect of organic, conventional and mixed cultivation practices on

soil microbial community structure and nematode abundance in a cultivated onion crop. *Journal of the Science of Food and Agriculture*.

Cullen, E.M. and K.M. Holm. Accepted Nov. 2012 pending minor revision. Aligning insect IPM programs with a cropping systems perspective: Cover crops and cultural pest control in Wisconsin organic corn and soybean. *Journal of Sustainable Agriculture*.

Schmidt, N.P., M.E. O'Neal, P.F. Anderson, D. Lagos, D. Voegtlin, W. Baily, P. Caragea, E. Cullen, C. DiFonzo, K. Elliott, C. Gratton, D. Johnson, C.H. Krupke, B. McCornack, R. O'Neil, D.W. Ragsdale, K.J. Tilmon and J. Whitworth. 2012. Spatial distribution of *Aphis glycines* (Hemiptera: Aphididae): A summary of the suction trap network. *Journal of Economic Entomology* 105:259-271.

Barham, Bradford L., Mercedes Callenes, Seth Gitter, Jessa Lewis, and Jeremy Weber. 2011. Fair Trade/Organic Coffee, Rural Livelihoods, and the 'Agrarian Question': Southern Mexican Coffee Farmers in Transition, *World Development* 39(1):134-145.

Greenway, G, J Guenther & R Genger. 2011. Cost of producing organic fresh potatoes and seed potatoes in the Midwest. University of Idaho AE Series 2011-04.

Genger, R., E. Mueller, R. Groves, S. Jansky, D. Rouse and A. Charkowski, 2011. Production of healthy seed potatoes on organic farms. Poster presentation at MOSES Organic Farming Conference, February 24-26, 2011 La Crosse WI.

Mueller, E., R. Genger, A. Charkowski, and R. Groves, 2011. The effect of mixed cropping systems on winged aphid dispersal and Potato virus Y spread in organic potato crops. Poster presentation at MOSES Organic Farming Conference, February 24-26, 2011. La Crosse WI.

Charkowski, A., R. Genger, R. Groves, E. Mueller, J. Guenther, 2011. Production of healthy seed potatoes on organic farms. *Phytopathology* 101:S31. Annual Meeting, American Phytopathological Society, Aug 6-11, 2011. Honolulu HI.

Cullen, E.M. 2010. Extension specialist roles in communities of interest and place: An example from the agriculture-wildlife interface. *Journal of Extension* 48(1): 1FEA2.

O'Neal, M., K. Johnson, E. Hodgson, D. Ragsdale, I. MacRae, B. Potter, C. DiFonzo, K. Tilmon, E. Cullen, P. Glogoza and B.P. McCornack. 2010. Comment on "Soybean Aphid Population Dynamics, Soybean Yield Loss, and Development Stage-Specific Economic Injury Levels" by M.A. Catangui, E.A. Beckendorf, and W.E. Riedell. *Agronomy Journal* 101: 1080-1092 (2009). *Agronomy Journal* 102: 55-56.

Chavas, J-P, Posner, J and Hedtcke, J L, 2009. Organic and Conventional Production Systems in the Wisconsin Integrated Cropping Systems Trial: II. Economic and Risk Analysis 1993–2006. *Agron. J.* 101:288-295.

Hsieh, M., P. Mitchell, K. Stiegert. 2009. "Potato Demand in an Increasingly Organic Marketplace" *Agribusiness: An International Journal* 25(3):369-394.

- Posner, J. L., Frank, G. G., Nordlund, K.V., and R. T. Schuler, 2009. A Constant Goal, Changing Tactics: The Krusenbaum Dairy Farm (1996-2005). *Journal of Renewal Agriculture and Food Systems* 24(1); 8-18.
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- Kraiss, H. and E.M. Cullen. 2008. Insect growth regulator effects of azadirachtin and neem oil on survivorship, development and fecundity of *Aphis glycines* (Hemiptera: Aphididae) and its predator, *Harmonia axyridis* (Coleoptera: Coccinellidae). *Pest Management Science* 64:660-668.
- Kraiss, H. and E.M. Cullen. 2008. Efficacy and non-target effects of reduced-risk insecticides on *Aphis glycines* (Hemiptera: Aphididae) and its biological control agent, *Harmonia axyridis* (Coleoptera: Coccinellidae). *Journal of Economic Entomology* 101:391-398.
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- Cho, S., C.P. Fossler, F. Diez-Gonzalez, S. J. Wells, C. W. Hedberg, J. B. Kaneene, P. L. Ruegg, L. D. Warnick, and J. B. Bender. 2007. Antimicrobial susceptibility of shiga toxin-producing *Escherichia coli* isolated from organic dairy farms, conventional dairy farms, and county fairs in Minnesota. *Foodborne Path* 4:178-186.
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Extension and Outreach Publications

[Animal Health Regulations for Organic Dairy Herds \(video\)](#)
[Becoming a Certified Organic Producer](#)
[Biological Control of Insects and Mites: An Introduction to Beneficial Natural Enemies and Their Use in Pest Management](#)
[Direct Marketing: What is Organic Agriculture?](#)
[Economic Impact of the Organic Sector in Wisconsin and Beyond](#)
[Influence of Preharvest Factors on Postharvest Quality](#)
[Insect IPM in Organic Field Crops: Seedcorn Maggot](#)
[Integrated Pest Management in Organic Field Crops Webinar](#)
[Mid-scale food value chains case study: Organic Valley \(Research Brief #80\)](#)
[Organic Agriculture in Wisconsin: 2012 Status Report](#)
[Overview of Organic Cranberry Production](#)
[Perceptions of Disease by Organic Dairy Producers – Preliminary Results of a Multistate Study](#)
[Respiration and Ethylene and their Relationship to Postharvest Handling](#)
[Scaling Up: Meeting the Demand for Local Food](#)
[Toward a Sustainable Agriculture](#), a curriculum for high school students and teachers
[Treatment of Disease by Organic Dairy Farmers – Preliminary Results of a Multistate Study](#)
[Use of Veterinarian on Organic Dairy Farms – Preliminary Results of a Multistate Study](#)
[Veggie Compass: Whole Farm Profit Management Webinar](#)
[Wisconsin College and University Programs and Projects in Sustainable Agriculture \(2009\)](#)

Academic Curricula

UW-Madison does not offer an organic or sustainable agriculture undergraduate [major](#). Organic courses offered include: Agroecology I: The farm as a socio-environmental endeavor (3 cr.); Agroecology II: Agriculture's social contract (3 cr.); Hort 410 Colloquium in Organic Agriculture (1 cr.); and Plant Path 375 Organic and Urban Production (3 cr). Other classes have been offered on a more irregular basis.

UW-Madison is creating a spring course (Organic and Urban Agriculture) for students under the Sustainability Initiatives in Research and Education grant (Charkowski, Silva, Colquhoun, Bell, Ventura, and Bussan)

UW-River Falls offers a [sustainable agriculture minor](#) within its BS degree in Crop and Soil Science. New courses developed for the program address environmental sustainability, organic agriculture, rural sociology, integrated pest management, sustainable agriculture law and sustainable animal production.

Northeast Wisconsin Technical College, Green Bay, offers an eight-credit [certificate program in organic agriculture](#). In addition, the college provides non-degree professional development opportunities in sustainable agriculture and local, organic and sustainable

foods. NWTC offers the most comprehensive collection of organic production courses of any institution reviewed for this report - [Organic & Sustainable Agriculture and Food Courses 2012](#)

UW-Marathon County has offered an interdisciplinary course on “Social and Scientific Aspects of Organic Agriculture” on campus and via compressed video at UW Fox Valley in Menasha.

Madison Area Technical College (MATC) has offered a stand-alone, 3-credit organic farming course taught by an organic farmer and a PhD candidate studying sustainable agriculture.

Graduate Student Opportunities

The UW [Agroecology](#) Master's Program, while not specifically organic, stresses organic concepts; has trained [grad students](#) in organic projects; and posts announcements of upcoming Masters student [seminars](#).

The UW Horticulture Department has a Masters Degree in Horticulture with emphasis in [Organic Sustainable Production](#).

Graduate students are often engaged in the organic-focused research of individual PI's or teams of PI's.

Graduate students from UW initiated the planning of the first annual Student Organic Seed Symposium (in part sponsored by The Ceres Trust, Seed Matters, and Vitalis Seed) <https://sites.google.com/site/studentorganicseedsymposium/> and will be involved in planning the second annual event in 2013.

Outreach Efforts

The UW Center for Integrated Agriculture (CIAS) has a strong commitment to organic agriculture. While not solely focused on issues of the organic ag community, CIAS places a strong focus on serving the organic ag sector, through presence at conferences, development of outreach materials, organizing organic activities at UW, and spearheading grant opportunities.

A UW-Madison scientist (Erin Silva), in her role as chair of the Organic Working Group in the American Society of Horticultural Science, led the planning of a day-long symposium at the ASHS Annual Conference, “A Decade of Progress in Organic Agriculture Science, Teaching, and Extension,” with financial support from FAFO and SARE.

[Annual UW Agroecology Plays](#) (flyer)

[Fertility Strategies for Organic Vegetables—Wisconsin](#)

[GrassWorks Grazing Conference](#)

[Loving of the Land Agroecology Benefit Concert](#) (poster)

[Michael Bell Interview: Agroecology program distinctive](#) (podcast)

[Midwest CSA Conference](#)

[The Organic Apple Grower Hour](#)
[The Organic Farming Conference](#) (MOSES)
[UW Organic Field Day](#)
NOVIC Variety Trial Field Days and Plant Breeding/Seed Saving Workshops

Web Resources

[Center for Integrated Agricultural Systems](#)
[Consumer's Guide to Organic Food](#)
[Driftwatch](#)
[Growing Power, Inc.](#)
[Herd Health and Well Being](#)
[Local Food Resources in Western Wisconsin](#)
[Michael Fields Agricultural Institute](#)
[Midwest Organic and Sustainable Education Services](#)
[Organic Certification Cost-Share Program](#)
[Organic Valley](#)
[Project C.O.W.](#)
[SavorWisconsin.com](#)
[Wisconsin Organic Advisory Council](#)
[Wisconsin Organic Farm & Business Directory](#)

Hands-on Learning

FH King Students for Sustainable Agriculture manage a non-certified organic student farm: <http://www.fhkingstudentfarm.com/what-we-do/the-garden>

FH King has paid internships at the student organic farm:
<http://www.fhkingstudentfarm.com/get-involved/internship-program>

And it has hands-on workshops for students:
<http://www.fhkingstudentfarm.com/get-involved/lead-a-workshop>

UW-Madison offers an Organic [Study abroad](#) opportunity:
http://www.studyabroad.wisc.edu/programs/program.asp?program_id=301

UW-Madison is creating a summer internship “cohort” for students involved in sustainable agriculture, including organic, under the Sustainability Initiatives in Research and Education grant (Charkowski, Silva, Colquhoun, Bell, Ventura, and Bussan).

[UW Fox Valley](#)’s experiential learning opportunities involve students in local and organic food events and resource preparation, community garden projects, and school food and waste management.

The [UW-Stevens Point Global Environmental Management](#) (GEM) program on Sustainable Agriculture and Forestry offers a “Farmer Incubator” class, which provides opportunities for students to learn through farm visits, internships, and hands-on projects, as well as

classroom learning. UW-SP students run an organic garden as well as a student-administered café (cps café) on campus that focuses on using organic/local sources.

Milwaukee's [Growing Power](#) provides hands-on training, on-the-ground demonstration, and outreach and technical assistance through the development of Community Food Systems.

Acres Certified Organic

UW-Spooner Agricultural Research Station (ARS) – 20 acres in transition
UW-Arlington ARS – 22 acres certified organic, 70 acres in transition, and 17 acres organically managed as part of a long-term research trial
UW-West Madison – 10 acres certified organic, will transition 10 more
UW-Hancock – 14 acres organically managed

Total acres certified, managed organically, and in transition = 163

Organic Livestock Research

All organic livestock research conducted by the UW has been on-farm, with the UW having no certified organic animals at this time.

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Appendix - Author's Observations and Comments

While a great deal of organic research has been and is being conducted in the North Central Region, analysis for this report identified a number of gaps in current investigations. These areas include, but are not limited to:

- Organic livestock production, especially focused on integrated soil/crop/livestock relationships; multi-species systems; and animal welfare, for all species.
- Organic poultry production, including alternatives to DL-methionine, a synthetic feed additive, due to phased off the accepted list by the USDA's National Organic Program (NOP).
- Role of soil health in plant and animal disease prevention.
- Composting and natural resource recycling.
- Expansion of organic seed and livestock breeding programs for the NCR.
- Impacts of genetically engineered crops and products on organic production systems, and effective methods to prevent contamination.
- Pesticide impacts on organic production, ecosystems, and human health.
- Impacts of organic practices on ground- and surface-water quality.
- Irrigation water quality, quantity and conservation for organic production.
- Efficacy of NOP-approved crop and livestock inputs.
- Climate change mitigation and adaptation, including drought and flood impacts.
- Use of perennials in organic systems.
- Biodiversity enhancement and natural resource conservation in organic systems.
- Sustainable energy systems for organic farms and processing facilities.
- Organic food processing innovations focused on organic products produced in the NCR.
- Development of organic forms of non-organic ingredients allowed under NOP Section 205.606.
- Nutritional content of organic crops and foods.
- Connections between agricultural practices and public health.
- Successful strategies to facilitate organic transition by existing conventional farmers; beginning farmers; and immigrant populations.

The author observed that organic programs appear well supported and coordinated at some institutions in the NCR, while others lack sufficient institutional support. At the most functional LGUs, faculty from multiple disciplines, including agronomy, horticulture, soil science, animal science, veterinary medicine, economics, and food science, collaborate on organic research projects. To a lesser extent, faculty from agricultural engineering, natural resource sciences, rangeland management, and public health are involved.

Exemplary institutions have robust organic outreach programs, with dedicated staff, significant stakeholder advisory bodies, on-farm research programs, qualified research technicians, engaged, supportive administrators, and multi-state research projects.

Many opportunities exist to expand existing collaborations--within universities and Extension; with other universities and colleges in the region; with non-governmental organizations and state departments of agriculture; and with and between federal agencies, including the Agricultural Research Service (ARS), Natural Resources Conservation Service (NRCS), and National Organic Program (NOP).

The innovations in research, outreach, information delivery, administration, and multi-disciplinary cooperation at institutions with exemplary organic programs, as evidenced in this report, may be seen as models for researchers and administrators to improve the systems and practices at their institutions.

This report may also serve as a resource in the development of an interactive regional, or national, Organic Agriculture Library, where descriptions of organic research projects; research findings; refereed articles; Extension publications; outreach activities; researchers; web sites; and other resources are catalogued and made available to the public.

Jim Riddle
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