

2016 MCCC Michigan report

Contact Information

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RESEARCH- On-going cover crop research (by primary discipline)	
Name(s)	Project title/objective
COMMODITY SPECIFIC	
Baas, D.	Evaluation of oilseed radish added to wheat to increase wheat yields in Michigan
Baas, D. and P. Gross	Using cover crops with wheat to improve rotational profitability
Bird, G., N. Rosenzweig, L. Tiemann, B. Basso, R. Black, C. Long, M. Otto, C. Carr, B. Morgan, and R. Rant,	On-farm soil health research: With special reference to bio-based systems. Michigan Potato Industry Commission
Bird, G., N. Rothwell, D. Baas, B. Klein, and K. Powers	Impact of cover-crops/mulch/compost on tart cherry orchard development/productivity and soil health. Michigan Cherry Council supported
Hill, E.	Maximizing the cover crop potential of cereal rye before soybean through alternative termination timings and methods. Michigan Soybean Promotion Committee
Long, C., L. Tiemann, N. Rosenzweig, and E. Hill	Impact of increased cropping system diversity as measured by improved productivity and sustainability in a Michigan potato production system. Project GREEN and MI Potato Industry Commission 2016 & 2017
Renner, K., C. Sprague, L. Tiemann, P. Gross, J. Dedecker, and A. Brooker (Ph.D. student)	Early interseeding of cover crops into corn, exploring species, mixtures, and timings. Project GREEN and Corn Marketing Program 2016, Submitted to AFRI and Corn Marketing Program 2017
Sheaffer, C., J. Jungers, D. Wyse, S. Snapp, K. Cassida, and V. Morrone	Grain and forage from intermediate wheatgrass - A new perennial grain crop. CERES Trust 2015
Szendrei, Z., D.C. Brainard, M. Hausbeck, Z. Hayden et al.	Integrating organic cucurbit science and production in the Midwest. USDA-NIFA-OREI 2016-2019
COVER CROP MANAGEMENT	
Snapp, S., S. Kravchenko, et al. (collaboration with IL, MN, and PE)	Precision Zonal Management, includes a rye cover crop in some treatments. 2016 final year
Hill, E.	Complimentary seeding ratios to maximize groundcover and biomass production: Oats + radish

FORAGES/FEED	
Martin, R., J. Rowntree, K. Cassida, J. Schweihofer, M. Raven, L. Tiemann	Nutrient content of fall-grazed, high-energy forages and their effect on forage-finished beef nutrient composition. USDA-NIFA-AFRI and MAAA 2014
Wilke, B., H. Straub III, S. Utsumi	Intercropping summer annual grazing crops: Alternating legume and grass strips at planting
PEST/DISEASE MANGEMENT	
Bird, G., J. Shoemaker (M.S. Student), K. Renner, and J. Diel	Assessing the trap crop potential of cover crops for control of Soybean Cyst Nematode
Brainard, D.C., H. Melakeberhan, Z. Hayden, D. Baas and B. Werling	Optimizing cover crops for weed, nematode and nitrogen management in processing carrots. MDARD-MI Carrot Council 2015-2016
Cassida, K.A., J. Islieb, P. Kaatz, and J. Lindquist	Yield and nutritive value of annual legumes in Michigan forage systems. Project GREEN 2015
Chilvers, M. (contributing to Iowa State University)	Sequencing fungal and oomycete pathogens associated with cover crops
Sprague, C., E. Hill, and K. Renner	Cover crop sensitivity to herbicides
Sprague, C. K. Rogers (M.S. Student), and K. Renner	Integrating cultural practices to aid in the management of glyphosate-resistant Palmer amaranth (includes cereal rye)
SOIL FERTILITY	
Steinke, K.	How to cover crops impact nutrient cycling temporally and spatially
SOIL SCIENCE/ HEALTH/ BIOLOGY- OTHER	
Cassida, K., S. Snapp, V. Morrone, and K. Renner	Using Cover Crops after Wheat to Improve Soil Health. Project GREEN, GR14-055.
Kravchenko, S., K. Renner, A. Guber, and M. Thelen (New student coming soon)	Topographically diverse landscape influences on cover crop establishment and ecosystem services in corn and wheat cropping systems. Project GREEN 2016, CRDF Global 2017-2019, USDA-Org Transition submitted
Rangarajan, A., D.C. Brainard, E. Gallandt, Z. Szendrei, L. Rodriguez, V. Morrone et al.	Farmer-Designed Systems to Reduce Tillage on Organic Vegetable Farms. USDA-NIFA-OREI 2014-2018
Snapp, S. et al.	Long Term Ecological Research with some rotations including cover crops
Tiemann, L.	Building soil health through rotational diversity and soil microorganisms. Foundation for Food & Agricultural Research 2016

PUBLICATIONS, EXTENSION/OUTREACH

New MI Cover Crop website launched in 2016- www.covercrops.msu.edu

Snapp, S., L.K. Tiemann, N. Rosenzweig, D. Brainard, G. Bird. (2016) Managing Soil Health for Root and Tuber Crops. MSU Extension Bulletin E-3343, East Lansing, MI.

MSU EXTENSION NEWS ARTICLES AVAILABLE @ www.covercrops.msu.edu

- Baas, D. 2016. Cover Cropping for pollinators and beneficial insects publication available. MSU Extension News. January 25, 2016.
- Isleib, J. 2016. Building soil organic matter on Upper Peninsula crop rotations- Part 2 of 2. MSU Extension News. February 16, 2016.
- Gross, P. 2016. Frost seeding red clover into winter wheat. MSU Extension News. March 8, 2016.
- Baas, D. 2016. Interseeded cover crops: Come see them in the spring. MSU Extension News. April 7, 2016.
- Harrigan, T. 2016. Phosphorus losses in surface runoff and tile drainage: Ontario experience. MSU Extension News. April 14, 2016.
- Hill, E. 2016. Tips for terminating an annual ryegrass cover crop. MSU Extension News. April 15, 2016.
- Curell, C. 2016. Spring cover crop check list. MSU Extension News. April 19, 2016.
- DeDecker, J. 2016. Northeast Michigan field crop regional report- April 28, 2016. MSU Extension News. April 28, 2016.
- DiFonzo, C. 2016. Weeds, wet weather, and cutworms. MSU Extension News. May 3, 2016.
- Anderson, E. 2016. Spring 2016 field crop weeds update for southwest Michigan. MSU Extension News. May 19, 2016.
- Kelley, L. 2016. Dry field conditions create need for early season irrigation. MSU Extension News. June 2, 2016.
- DeDecker, J. 2016. Northeast Michigan field crop regional report- June 16, 2016. MSU Extension News. June 16, 2016.
- Day, M. 2016. Everman and woman's job: Part 2. MSU Extension News. June 20, 2016.
- Anderson, E. 2016. Interseeding cover crops into standing cash crops. MSU Extension News. July 1, 2016.
- Hill, E. 2016. Stacking the deck: How to win at cover crop establishment. MSU Extension News. July 5, 2016.
- Gross, P. 2016. Central Michigan field crop regional report- July 29, 2016. MSU Extension News. July 29, 2016.
- Jean, M. 2016. Choosing a cover crop for potato production. MSU Extension News. September 19, 2016.
- McFarland, A. 2016. Lessons learned from cover crop usage in the Upper Peninsula. MSU Extension News. October 14, 2016.
- Burlew, S. 2016. Conservation programs help reduce erosion and protect water quality. MSU Extension News. November 16, 2016.

PUBLICATIONS, REFEREED

- Brainard, D.C., A. Bryant, D.C. Noyes, E.R. Haramoto and Z. Szendrei. 2016. Evaluating pest-regulating services under conservation agriculture: A case study in snap beans. *Agriculture, Ecosystems and the Environment* 235: 142-154
- Hill, E.C., K.A. Renner, C.L. Sprague, and A.S. Davis. 2016. Cover crop impact on weed dynamics in an organic dry bean system. *Weed Sci.* 64:261-275.
- Hill, E. C., K.A. Renner, and C.L. Sprague. 2016. Cover crop impact on nitrogen availability and dry bean characteristics in an organic system. *Agron. J.* 108:329-341.
- Jean, Monica A. (2016). *Cattle, Corn Stover and Bioenergy: A Sustainable Integrated System.* (Thesis). Michigan State University. (No. 10142668)

- Lowry, C. and D.C. Brainard. 2016. Strip-intercropping of rye-vetch mixtures affects biomass, C:N ratio, and spatial distribution of cover crop residue. *Agron J* 108: 2433-2443.
- McDaniel, M.D, A.S. Grandy, L.K. Tiemann, and M. N. Weintraub. Over 2016. Eleven years of crop diversification alters decomposition dynamics of litter mixtures incubated with soil. *Ecosphere* 7(8) Article e01426.
- Tumbalam, P., K. Hard, and K. Thelen. 2016. Integrating winter annual cereal rye or triticale into a corn forage biofuel production system, *J Crop Improv.* 30:526-530. DOI: 10.1080/15427528.2016.1189472.
- Quinn, N.F., D.C. Brainard, and Z. Szendrei. 2016. The effect of conservation tillage and cover crop residue on beneficial arthropods and weed seed predation in acorn squash. *Environ Entomol.* 45:1543-1551.
- Quinn, N.F., D.C. Brainard, and Z. Szendrei. 2016. Floral strips attract beneficial insects but do not enhance yield in cucumber fields. *J Econ Entomol.* *In press*
- Grabau, Z.J., Z.T. Maung, D.C. Noyes, D.G. Baas, B.P. Werling, D.C. Brainard, H. and Melakeberhan. 2016. Effects of oat, oilseed radish, and oilseed rape cover crops on *Pratylenchus penetrans* and the nematode community in Michigan carrot production, *J Nematol.* *In press*

Not included on previous 2015 report

Krasnow, C.S. and M.K. Hausbeck. 2015. Pathogenicity of *Phytophthora capsici* to Brassica vegetable crops and biofumigation cover crops (*Brassica* spp.). *Plant Disease.* 99:1721-1726.

PRESENTATIONS, EXTENSION

Grower Field Days

- Focus On Forages, Multiple locations in MI (D. Baas, C. Curell, and/or P. Gross)
- Bracy Ag Services Field Day, Quincy, MI (D. Baas)
- Bedford Farm Services Grower Meeting, Edmore, MI (D. Baas)
- MSU Agriculture Innovation Day: Focus on Soils, Frankenmuth, MI
 - Healthy soil- Dig a little, lean a lot (L. Tiemann and D. Baas)
 - Successful cover crops- From seed selection to planting techniques (E. Hill, K. Renner, A. Brooker)
 - How do your soils handle rain? Understand the impact of rainfall on various tillage and crops (P. Gross and J. Marshall)
 - Digging into the science of soil compaction: How to prevent, detect and alleviate soil compaction (F. Arriaga and M. Thelen)
- Blueberry Session at SW Hort Days, Benton Harbor, MI (D. Baas)
- 49th Annual Branch County Farmer's Day, Coldwater, MI (C. Curell)
- Osceola-Lake Soil Health and Cover Crop Field Day, Marion, MI (C. Curell and P. Gross)
- Upper Peninsula Farmer to Farmer Learning Project - U.P. field days (P. Gross)
- Michigan Potato Industry Commission and MSU Field Day- Cover crops for potato rotations
 - Presque Isle Co, Hawks, MI (E. Hill)
 - Upper Peninsula, Rock, MI (E. Hill)
- Zilke Vegetable Farm Twilight Meeting- Cover crops for weed suppression, Milan, MI (D. Brainard, S. Tilton, and D. Noyes)
- Malburg Farms Field Day- Cover Crops for carrot rotations, Hart, MI (D. Brainard, H. Melakeberhan, Z. Szendrei, M. Hausbeck, B. Werling, D. Baas, and Z. Hayden)

- Michigan Potato Industry Commission Research Committee Meeting and Montcalm Field Day- Impact of cover crop diversity in potato systems, Lakeview, MI (E. Hill)
- Kellogg Biological Station Grazing Dairy Field Day- Brassicas as a fall/winter feed source, Hickory Corners, MI (B. Wilke)
- Kellogg Biological Station Grazing School, Hickory Corners, MI (B. Wilke)
- MAEOE conference- Cover crop tour, Hickory Corners, MI (B. Wilke)

Grower Meetings

- Michigan Potato Industry Commission Winter Conference -Soil health research, East Lansing, MI (L. Tiemann)
- ADVANCED Master Gardener Training (webinar): The Hidden World of Soils (D. Baas)
- Pesticide Applicator Training, Centreville, MI (D. Baas)
- Focus on Your Crop Rotation-Ag Action Day Program 2016, Oshtemo, MI (D. Baas, and P. Gross)
- 2016 Great Lakes Intertribal Food Summit, Hopkins, MI (D. Baas, C. Curell, and/or P. Gross)
- Bass River Deer Creek Restoration Project - Cover Crops Workshop, Jenison, MI (D. Baas)
- Using Cover Crops for Nutrient Management and Soil Health, Multiple locations in MI (D. Baas, C. Currell, and P. Gross)
- Managing Cover Crops for Water Quality and Cash Crop Success Webinar (D. Baas)
- St. Joseph County IPM Breakfast Meeting Series, Centreville, MI (D. Baas)
- Chestnut Scouting Workshops, Clarksville and Traverse City, MI (D. Baas and C. Curell)
- Farmer Veteran Coalition Stakeholder Meeting, East Lansing, MI (P. Gross, and M. Thelen)
- Great Lakes Fruit, Vegetable, and Farm Market Expo- Asparagus session, Grand Rapids, MI (H. Melakeberhan, B. Werling, Z. Hayden, D. Baas)
- Ontario Fruit and Vegetable Conference, Niagara Falls, ON
 - Maintaining soils in vegetable crops- Soil Health Session (D. Brainard)
 - Reduced tillage and cover cropping in vegetables- Sustainable Horticulture Session (D. Brainard)
 - Cover crop residue management in cucurbits- Vegetable Session (D. Brainard)

Conservation Districts/NRCS/Drain Commission Field Days/Meetings

- Highland Ag and Natural Resources Conference, Cadillac, MI (D. Baas, C. Curell, and P. Gross)
- Missaukee Co. Soil Conservation District Annual Meeting, McBain, MI (P. Gross)
- Lenawee Center for Excellence Field Day, Clayton, MI
 - (C. Curell)
 - Overseeding corn with cover crops (K. Renner and A. Brooker)

Agribusiness Meetings

- DeKalb Seed Corn Growers meeting, Mason, MI (K. Renner and A. Brooker)

Other Tours/Meetings

- MAEAP Training- Sustainable Agriculture/Cover Crop Tour, Hickory Corners, MI (B. Wilke)

PRESENTATIONS, SCIENTIFIC/SOCIETY

Bjorkman, T, D.C. Brainard, C. Lowry and J. Masiunas. 2016. Fall incorporation of cover crops reduces snap bean stand. Poster no. 339. American Society for Horticultural Science Annual Meeting. August 2016, Atlanta, GA. (poster)

- Brainard, D.C., N. Quinn, E. Haramoto, M. Frost and Z. Szendrei. 2016. Tillage and cover crop effects on seed predation and decay in a long-term vegetable rotation. Abstract no. 362. Weed Science Society of America Annual Meeting. February 2016. San Juan, Puerto Rico.
- Brooker, A., K. Renner, and C. Sprague. 2016. Critical cover crop-free period in corn. North Central Weed Science Society Annual Meeting. Dec. 12-15, 2016. Des Moines, IA.
- Brooker, A., K. Renner, C. Sprague, and L. Tiemann. 2016. Interseeding cover crops in Michigan corn rotations. ASA-CSSA-SSSA International Meeting. Nov. 6-9, 2016. Phoenix, AZ.
- Hayden, Z.D., C. Lowry, D.C. Noyes and D.C. Brainard. 2016. System effects of strip tillage and compost with zonal cover cropping in organic broccoli. Abstract. American Society for Horticultural Science Annual Meeting. August 2016, Atlanta, GA.
- Martin, R.M., J.E. Rowntree, K.A. Cassida, and D. Carmichael. 2016. Impact of high-energy forages on grass-finished steer performance and carcass merit. J. Anim. Sci (E-Suppl. 5)/J. Dairy Sci. (E-Suppl. 5):311. Joint Annual Meeting, Salt Lake City, Utah, July 19-23, 2016. (poster)
- Tiemann, L.K. 2016. Belowground benefits of rotational diversity. National No-tillage Conference, Indianapolis, IN- featured presentation

MICHIGAN STATE UNIVERSITY COURSES THAT DISCUSS COVER CROPS

- CSS 101- Introduction to Crop Science
- CSS101L- Introduction to Crop Science Lab
- CSS 201- Forage Crops
- CSS 212- Advanced Crop Production
- CSS 288- Principles of Weed Management
- CSS 360- Soil Biology
- CSS/BSE/FOR 467- BioEnergy Feedstock Production
- CSS480- Soil Fertility and Nutrient Management
- CSS 488- Agricultural Cropping Systems: Integration & Problem Solving
- ENT 205H- Pests Society and the Environment
- ENT 479- Organic Pest Management
- HRT 251- Organic Farming Principles and Practices
- HRT 341- Vegetable Production and Management