

## 2015 MCCC Michigan report

### Contact Information

Name: Erin Hill

Organization: Department of Plant, Soil and Microbial Sciences, Michigan State University

Email: [hiller12@msu.edu](mailto:hiller12@msu.edu)

Phone: 517-353-0467

<b>RESEARCH- On-going cover crop research (by primary discipline)</b>	
<b>Name(s)</b>	<b>Project title/objective</b>
<b>COMMODITY SPECIFIC</b>	
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. Rothwell, D. Baas, B. Klein, and K. Powers	Impact of cover-crops/mulch/compost on tart cherry orchard development/productivity and soil health
Bird, G. and S. Gower	Corn yield response to cover crop mixtures and management strategies
Brainard, D. (joint with Cornell University and the University of Maine)	Interactions between winter-killed cover crops and tillage systems prior to snap beans
Brainard, D.	Impact of spatial segregation of cover crop mixtures for late-planted broccoli production
Hill, E.	Maximizing the cover crop potential of cereal rye before soybean through alternative termination timings and methods
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.
Pennington, D. and M. Nagelkirk	High yielding wheat study: How will growth regulator(s) impact interseeded clover?
Renner, K., C. Sprague, and A. Brooker (Ph.D. student)	Interseeding cover crops into corn, exploring species, mixtures, and timings
Thelen, K., S. Wang (Ph.D. student), and P. Tubalam	Great Lakes Bioenergy Project lifecycle analysis
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
<b>COVER CROP MANAGEMENT</b>	
Baas, D., N. Millar, and P. Robertson	Effect of Cover Crops On Nitrous Oxide Emissions, Nitrogen Availability and Carbon Accumulation in Organic Versus Conventionally Managed Systems
Snapp, S., S. Kravchenko, et al. (collaboration with IL, MN, and PE)	Precision Zonal Management, includes a rye cover crop in some treatments

<b>FORAGES/FEED</b>	
Cassida, K. and S. Gerdes (M.S. student)	Forages as cover crops in a wheat-corn rotation
Thelen, K. and M. Jean (M.S. student)	Interseeding cover crops into corn to examine the bioenergy and animal feed potential
<b>PEST/DISEASE MANGEMENT</b>	
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
Baas, D. and D. Pennington	Comparing wheat, triticale, and rye for biomass production and weed control
Brainard, D., D. Baas, and H. Melakeberhan	Cover crops before carrots for control of nematodes (lesion and root knot) and improved soil health
Chilvers, M. (contributing to Iowa State University)	Sequencing fungal and oomycete pathogens associated with cover crops
Chilvers, M., M. Roth (Ph.D. student), K. MacCready, and F. Trail	Pathogen associations with crops at the Long Term Ecological Research site
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)
<b>SOIL FERTILITY</b>	
Steinke, K.	How to cover crops impact nutrient cycling temporally and spatially
<b>SOIL SCIENCE/ HEALTH/ BIOLOGY</b>	
Brainard, D., D. Baas, and H. Melakeberhan	Cover crops before carrots for control of nematodes (lesion and root knot) and improved soil health
Cassida, K., L. Tiemann, C. Long, N. Rosenzweig	Integrated crop, livestock systems in Michigan's Upper Peninsula
Snapp, S. et al.	Long Term Ecological Research with some rotations including cover crops
Steinke, K., M. Swoish (M.S. student), N. Rosenzweig, and W. Kirk	Impact of cover crops in microbial abundance/biomass and diversity and soil physical properties for corn and soybean production

<b>PROJECTS, EXTENSION/OUTREACH</b>		
Name(s)	Project title/objective	Related events/products
Brainard, D. and B. Werling	Brassica biofumigation for asparagus establishment	Field demonstration
Doll, J., M. Thelen, C. Curell, D. Baas, and P. Gross	Enhanced teaching resources for educators using the rainfall simulator	Posters, videos, and additional supplied for the rainfall simulator and 1-day educator training at NRCS Rose Lake Plant Material Center

## PUBLICATIONS, EXTENSION/OUTREACH

Baas, D., E. Kladvik, S. Casteel, T. Kaspar, D. Wyse, J. Hoorman, R. Hoormann, M. Ruark, D. Clay, S. Clay, P. Gross, N. Millar, H. Murray, and S. Noggle. 2015. Integrating cover crops in soybean rotations. Midwest Cover Crops Council. Available online at:  
[http://mccc.msu.edu/documents/2015Integrating\\_CoverCrops\\_Soybeans.pdf](http://mccc.msu.edu/documents/2015Integrating_CoverCrops_Soybeans.pdf)

Werling, B., J. Bakker, C. Noyes, and D. Baas. 2015. Mustard cover crop: How to help your biofumigation potential. MSU Extension YouTube page, available at:  
<https://www.youtube.com/watch?v=jePUyzjXlmw&feature=youtu.be>

**MSU EXTENSION NEWS ARTICLES AVAILABLE @ <http://msue.anr.msu.edu/topic/info/agriculture>**

Isleib, J. 2015. Cover crop challenges in Michigan's Upper Peninsula. MSU Extension News. February 22, 2015.

Gross, P. 2015. Survey documents yield boost and soil health benefits of cover crops. MSU Extension News. February, 26, 2015.

Gross, P. 2015. Frost seeding red clover into winter wheat. MSU Extension News. March 6, 2015.

DeDecker, J. 2015. Grant helps study aerial seeding as method of cover crop establishment. MSU Extension News. March 11, 2015.

Isleib, J. and F. Wardynski. 2015. Planting cover crops to improve clay soil quality used for pasturing livestock. MSU Extension News. March 26, 2015.

Curell, C. 2015. Cover crops and nitrogen scavenging. MSU Extension News. April 1, 2015.

Curell, C. 2015. Cover crops and soil organic matter. MSU Extension News. April 1, 2015.

Curell, C. 2015. Cover crops as nitrogen source. MSU Extension News. April 1, 2015.

Wardynski, F. 2015. Cover crops as livestock feed. MSU Extension News. June 12, 2015.

Gross, P. 2015. Wheat harvest opens window for cover crop establishment. MSU Extension News. July 24, 2015.

Baas, D. 2015. Time to think about cover crops after soybeans. MSU Extension News. August 7, 2015.

Gross, P. 2015. Overcoming cover crop establishment challenges. MSU Extension News. September 24, 2015.

Baas, D. 2015. Considering interseeding cover crops in standing crops? MSU Extension News. October 15, 2015.

Curell, C. 2015. It is not too late to plant cover crops. MSU Extension News. November 5, 2015.

McFarland, A. 2015. Can cover crops work in the Upper Peninsula? MSU Extension News. December 22, 2015.

## PUBLICATIONS, REFEREED

Bjorkman, R, C. Lowry, J. W. Shail, Jr., D. C. Brainard, D. S. Anderson, and J. B. Masiunas. 2015. Mustard cover crops for biomass production and weed suppression in the Great Lakes Region. Agron. J. 107:1235-1249.

Hayden, Z. D., M. Ngouajio, and D. C. Brainard. 2015. Planting date and staggered seeding of rye-vetch mixtures: Biomass, nitrogen, and legume winter survival. Crop Eco. Phys. 107:1-8.

## PRESENTATIONS, EXTENSION

### ***Grower Field Days***

- Clinton County- “What’s New in Poo?”- Rainfall simulator (M. Thelen and P. Gross)
- Polmsters Fruit Growers- Rainfall simulator (P. Gross and C. Tally)
- St. Joesph County- “Interseeding cover crops field day” (D. Baas, C. Curell, and P. Gross)
- Read Farms, Fenwick, MI- “Herbicide management with cover crops”- Sept. 23, 2015 (E. Hill)
- Read Farms, Fenwick, MI- “Choosing Cover Crops for your Rotation”- Sept. 23, 2015 (C. Curell)
- Urban Farming- 2 day event. Novi and Flint. Using Cover Crops for Soil Fertility, and Cover Crop Selection (C. Curell)
- Forgotten Harvest Farm Field Day- Cover Crop Selection and Rainfall Simulator (C. Curell)
- Hillsdale County Farm Day- Rainfall Simulator (M. Thelen and C. Curell)
- MSU Weed Science Field Day, East Lansing, MI- “Interseeding cover crops into corn- Year 1”- July 1, 2015 (K. Renner, C. Sprague, and E. Hill)

### ***Grower Meetings***

- Michigan Family Farms Conference in Marshall, MI- Rainfall simulator (P. Gross and C. Curell)
- Branch County Farmers Day (Paul Gross)
- Michigan Christmas Tree Association Summer Meeting in Manton, MI- presentation and hands-on soil health tools demonstration- 2 day event (P. Gross and C. Curell)
- Orchard and Vineyard Expo- Orchard soil health (G. Bird)
- Dry Bean and Sugarbeet Symposium-Cover crops (G. Bird)
- Great Lakes Crop Summit, Mount Pleasant, MI- Nematodes/Cover crops/Soil Health (G. Bird)
- Ontario Fruit and Vegetable Convention, Niagra Fall, ON, Canada- Vegetable soil health (G. Bird)
- Michigan Grape and Wine Conference, Kalamazoo, MI- Vineyard soil health (G. Bird)
- Tomato soil health, Leamington, ON, Canada (G. Bird)
- Smart Soil Master Gardener Training, Gaylord, MI- Soil health (G. Bird)
- Organic Farming Workshop, Bichkek, Kyrgyzstan- Soil health (G. Bird)

### ***Conservation Districts/NRCS/Drain Commission Field Days/Meetings***

- Gratiot Soil Conservation District (P. Gross)
- Northeast District Drain Commissioners Meeting- Rainfall simulator (P. Gross)
- NRCS and MAEAP at Fife Lake- Rainfall simulator to demonstrate impact of cover crops on host farm (P. Gross and M. Thelen)
- Huron County Soil Conservation District Meeting in Elkton, MI (P. Gross)
- NRCS Rose Lake Plant Materials Center- “Digging Deeper into Soil Health”- Cover crop and soil health training (P. Gross and C. Curell)
- Saginaw Chippewa Indian Tribe Watershed and the Isabella Country Soil Conservation District tour (P. Gross)
- Missaukee County Soil Conservation District- MAPEAP Phase I meeting at the Lake City Ag-Bio Research Station- Rainfall simulator (P. Gross)
- VanBuren County Soil Conservation District annual field day in Paw Paw, MI- Rainfall simulator (P. Gross)
- Isabella County Soil Conservation District- MAPEAP Phase I program- Demonstration plot tour (P. Gross)

- Hillsdale/Monroe Farming in the Lake Erie Watershed.- Choosing Cover Crops to Reduce Soil Erosion. 2 Day event. (C. Curell)
- Osceola-Lake Conservation District Summer Soil Health and Cover Crop Series- 6 Twilight Tours throughout the Spring/Summer/Fall (C. Curell)
- Newaygo Conservation District MAEAP Meeting- 2 Day event during the County Fair (C. Curell and B. Werling)
- Mason-Lake Conservation District MAEAP Phase 1 Meetings 2 one in the spring and one in the fall- Cover Crop and Soil Health and Cover Crop Mixes (C. Curell)
- Shiawassee Conservation District MAEAP Phase 1 Field Day- Cover Crops for Water Quality (C. Curell)
- Iosco County Farm Tour – MAEAP Phase I - Building a Better Rotation for Soil Health, Nutrient Utilization and Pest Control (M.Thelen)

#### ***Agribusiness Meetings***

- Michigan Agri-Business Association Winter Meeting- “Biological Limitation of Soil Health” (P. Gross)
- Michigan Agri-Business Association Winter Meeting – “Physical Properties of Soil” (M. Thelen)

#### ***Other Tours/Meetings***

- Baker College Agriculture Program Owosso- Cover Crops and Production Working with the students and instructors to plan and implement a rotation using cover crops to enhance soil and production. (C. Curell)
- Baker College Agriculture Program Cadillac- Cover Crops and Soil Health- Working with the students and instructors to plan and implement a rotation using cover crops to enhance soil and production. (C. Curell)
- Quebec farmers tour of MI, with 3 stops looking at cover crops, no-till and soil health (P. Gross, and O. Menard)
- North Central Grazing Network, Lake City – Rainfall simulator (C. Curell and M. Thelen)

### **PRESENTATIONS, SCIENTIFIC/SOCIETY**

Gerdes, S., K. Cassida, S. Snapp, V. Morrone, and K. Renner. 2015. Using cover crops in wheat-corn rotations to provide forage while improving soil health. ASA-CSSA-SSSA annual meeting. Minneapolis, MN.

Hill, E. K. Renner, and C. Sprague. 2015. Quantifying the impacts of cover crops on organic dry beans. Organic Agriculture Research Symposium, La Crosse, WI and live broadcast on eXtension-eOrganic.

Millar N, DG Baas and GP Robertson. Nitrous oxide emissions from Midwest row-crops: Comparing presence and absence of winter cover crops. GLBRC Sustainability Retreat 2015. Kellogg Biological Station, February 9-11, 2015 (Poster)

Millar N, DG Baas and GP Robertson. The influence of potential biofuel cover crops on nitrous oxide (N<sub>2</sub>O) emissions from Midwest row-crops. USDA-DOE Plant Feedstock Genomics for Bioenergy Meeting, Washington DC, February 22-25, 2015 (Poster)

Millar N, DG Baas and GP Robertson. The influence of potential biofuel cover crops on nitrous oxide (N<sub>2</sub>O) emissions from Midwest row-crops. GLBRC 2015 Annual Meeting, South Bend, IN, May 19-21. (Oral)

Millar N, DG Baas and GP Robertson. The influence of potential biofuel cover crops on nitrous oxide (N<sub>2</sub>O) emissions from Midwest row-crops. ASA, CSA, SSSA 2015 Annual International Conference, Minneapolis, MN, Nov 15-18, 2015. (Oral)

Rogers, K. M. and C. L. Sprague. 2015. Preharvest herbicide application effects on winter wheat harvestability. North Central Weed Science Society. Indianapolis, IN. (98)

Thelen, M. 2015. Rainfall simulator use for extension programming. National Association of County Agricultural Agents. Sioux Falls, SD.

#### **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