

## OSU Extension Annual Performance Report

Report Timeframe: 01/2019 - 12/2019

### Contact Information:

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Specialization(s): Agronomic Crop Management, Nutrient management, Certified Crop Adviser training, International Agriculture

### Reviewing Performance

#### 1. Progress on Performance Goals

- Goal 1: Deliver agronomic crop information to Ohio producers.
- Progress 1:
  - Published 12 monthly issues of C.O.R.N. to go.. in Ohio's Country Journal with a readership of 22,000.
  - Finalized and published an updated Corn, Soybean, Wheat and Forages Field Guide to Extension Publications in January 2019. Through the end of 2019 it was the most requested AgNR Extension publication.
  - Supported editors, assisted with delivery of 41 issues of the C.O.R.N. newsletter which has a subscriber base of about 5000 and additional web readers of 6,000 to 25,000 each month.
  - Provided agronomic education to 3395 program attendees and in one-on-one discussions with growers, including about 350 in the Farm Science Review Agronomy Demonstration area.
- Goal 2: Increase the awareness of "Extension Agronomy Day" events across Ohio
- Progress 2:
  - Encouraged county educators and C.O.R.N. editors to include agronomic programming in the newsletter; included regular monthly updates in Ohio's Country Journal throughout year.
- Goal 3: As Agronomic Crops Team co-coordinator work to meet education needs and research interests of team members.
- Progress 3:
  - Invited team members to attend and participate in the CCA Exam Preparation class (basic agronomy), Western Ag Research Station Agronomy Field Day, FSR Agronomy College, and the OABA Winter Conference.
  - Continued working with Steve Culman on updates to Ohio nutrient recommendations.
  - Worked with Libby Dayton and Jeff Hattey on developing and implementing a presentation of the new P-Risk Index.
- Goal 4: As co-coordinator of the Agronomic Crops Team: Continue to update the Agronomic Crops Team website.
- Progress 4:
  - Updates are never ending, most recent concerns are search engine and tagline development. Working with summer intern developed and expanded list of tags.

- Working with the web support team developed a map app to allow farmers to locate on-farm research trials in their area.
- Added a new page to the site for Alternative Agronomic Crops.
- Goal 5: Provide agronomic crop production education to international audiences.
- Progress 5:
  - Receive and reply to frequent email questions from Ukraine on cropping practices and recommendations.
  - While I made no visits to Ukraine in 2019, I did entertain two groups of farm managers and agronomists from Ukraine to the U.S. Provided an overview of my concerns for Ukraine agriculture and recommendations to improve practices.
  - Completed discussions with a U.S. and Ukraine team on development of basic and advanced agronomy courses for Ukraine agronomists for 2020. Farm managers feel their recent college hires are in-experienced and under-trained – a team of U.S. agronomists would provide a short course to bring them up to speed on modern practices of production agriculture.

## 2. Extension Teaching, Programs, and Curriculum Development

<u>Area</u>	<u>Classes</u>	<u>attendees</u>	<u>one-on-one training</u>
Crop management	13	168	525
Farm management	1	15	35
Nutrient management	5	210	125
Water quality/Nutrient mgt.	6	515	
Pest Management	5	382	65

### Programs

Ohio CCA Exam Preparation Class	25
OABA Winter Conference	290
Conservation Tillage Conference	850
WARS Agronomy Field Day	95
FSR Agronomy College	95
Farm Science Review	and 100,000

### c. Extension Curriculum Development

Participatory curriculum development has been noted as most valuable for adult learning in the agricultural setting. I have been practicing these methods for some time and follow the guidance of the publications of Peter Taylor of the Agricultural Extension and Rural Development Department of the University of Reading in the United Kingdom.

- Participatory curriculum development relies on field-based activities to reinforce the educational message. But even more so it relies upon the participants' feedback, suggestions and broader learning efforts to improve upon the specific education lesson of the day, season or program.

My efforts at the Ohio State University have been largely directed toward increasing crop yield of corn and soybeans, and, as a parallel track, toward reducing costs by recommending the application of inputs as economically necessary.

- Three audiences are principally targeted in teaching: Ohio agronomic crop growers; crop advisors [specifically Certified Crop Advisers (CCAs)] and AgNR field educators, especially those with an interest in aiding their local crop producers.

#### Formal Curriculum Development:

Overview: The curriculum is designed to meet Ohio Department of Agriculture (ODA) regulations aimed at protecting Ohio's water quality -- protection provided in part by requiring training and certification for private and commercial fertilizer applicators starting. The curriculum is available to all OSU Extension Agriculture and Natural Resource educators; meetings are conducted throughout Ohio using these materials to educate agricultural applicators for their certification requirement.

- For fall 2019 and winter 2020, updates to materials and recertification modules were prepared and distributed.

Title: Agricultural Fertilizer Applicator Certification Training (<http://nutrienteducation.osu.edu>, <http://agcrops.osu.edu/specialists/fertility>)

Overall Objectives: The goals within the curriculum are to 1) make farmers aware of the problems associated with fertilizer application, vis-a-vis water quality, as well as their responsibility under the law, 2) encourage individuals to find ways to further mitigate the problems with innovations in their own farming or fertilizer application operation, 3) reduce nutrient load in Ohio waters while maintaining and increasing yield.

- And to provide recertification modules for educator delivery after the preliminary training years.

Target audience: Farmers and commercial fertilizer applicators who apply fertilizer to 50 or more agricultural acres in Ohio are required to have fertilizer applicator certification by September 30, 2017. This is estimated to be 15-20 thousand individuals in Ohio. We are now in the re-certification phase of the program.

Curriculum Materials: The basic design of the curriculum is incorporated into the Table of Contents of one of the key curriculum components: the Agricultural Fertilizer Applicator Certification Training Manual. This 40-page booklet is the backbone of the course and is designed for the participants to keep as a reference. PowerPoint presentations have been developed and continue to be updated to deliver this course in five topical modules. The course in its original format was designed for a three-hour presentation, approximately one-half hour per module. Other materials created to further the program include a brochure and flyer template to describe and promote the program. The website (<http://nutrienteducation.osu.edu>) includes training videos created to help Extension educators and also informs applicators about certification and registration. The <http://agcrops.osu.edu/specialists/fertility> website provides fact sheets and links on the topic of nutrient management as well as the presentations. A survey was created for feedback from program participants.

Role: I have been involved in planning for this fertilizer certification beginning with discussions before the law or the regulations were written. I was part of the original 20-person team of Extension educators assembled in 2014 to develop the curriculum and became one of a core group of approximately five individuals who researched, authored, edited, and critiqued material

to create the Training Manual. I was author of the Nitrogen (N) Best Management Practices section within the Training Manual and created the Power Point presentation with complete speaker notes for that module. I also made contributions to other modules including the one on the Ohio water quality situation "HAB, N, P & Agriculture", adding the nitrogen pollution impact. The creators of the various modules served a peer review function for each other. Additionally, the nitrogen module was reviewed by Steve Culman, OSU Extension soil fertility specialist. I developed the condensed version of the course from the collaboratively-developed materials to ease delivery for county educators.

- Use by Others: The updated content modules were rolled out to the extension educators at an in-service meeting annually by a team of presenters. Updates are provided in a Box.com link that county educators can access for local training.
- Impact: Through 2019, more than 18,000 applicators have attended certification training. Approximately 60% of attendees surveyed through this period indicated they would "utilize an economic based nitrogen calculator", an important component of Watters' N management module. This survey response indicates a potential to meet the goal of improving water quality in Ohio.

### 3. Scholarly / Creative Work

#### a. Publications and Presentations:

Bulletins, Tech Reports, Fact Sheets

1. Corn, Soybean, Wheat, and Forages Field Guide. Edited by H. Watters. Authors: B. A. Ackley, D. B. Beegle, A. A. Collins, S. W. Culman, W. S. Curran, A. E. Dorrance, S. W. Duiker, P. D. Esker, G. A. LaBarge, E. M. Lentz, A. J. Lindsey, L. E. Lindsey, D. D. Lingenfelter, M. M. Loux, A. P. Michel, H. E. Ozkan, P. A. Paul, A. L. Raudenbush, G. W. Roth, R. M. Sulc, N. J. Taylor, P. R. Thomison, K. J. Tilmon, J. F. Tooker, H. D. Watters, J. A. Williamson. Extension Bulletin 827; The Ohio State University, College of Food, Agricultural, and Environmental Sciences. January 2019.

2. Nutrients Removed with Harvested Corn, Soybean, and Wheat Grain in Ohio. Steve Culman, Phoo P. Zone, Nakian Kim, Anthony Fulford, Laura Lindsey, Peter Thomison, Anne Dorrance, Rich Minyo, Eric Richer, Ed Lentz, Ryan Haden, Harold Watters, Greg LaBarge. OhioLine; The Ohio State University, College of Food, Agricultural, and Environmental Sciences. June 2019.

3. "Category 15 – Fertilizer" in 2020 Ohio Private Pesticide Applicator Recertification Proceedings. Watters, H; LaBarge, G; Hawkins, E. The Ohio State University, College of Food, Agricultural, and Environmental Sciences. December 2019.

Papers in Proceedings (Indicate Whether Peer Reviewed)

1. "From Lake Erie to the Ohio River: A Summary of Nutrient Loss Impacts in Ohio". Watters, H.D., Douridas, A., Bruynis, C. For Growing Agriculture @ 41 Degrees South. At the 22nd International Farm Management Congress Vol. 1 3rd - 8th March 2019. Launceston, Australia. <http://ifmaonline.org/contents/pr-from-lake-erie-to-the-ohio-river-a-summary-of-nutrient-loss-impacts-in-ohio/>. Peer reviewed.

2. Watters, H. "Ohio Experience with NDVI Tools." In: Embracing the Digital Environment, 2019 ASA-CSSA-SSSA International Annual Meeting; Nov. 10-13; San Antonio, Texas. <https://scisoc.confex.com/scisoc/2019am/meetingapp.cgi/Paper/118010?clearcache=1>. Peer reviewed.

#### Multimedia / Database / Website

1. Watters, H. Regular participant in conference calls. Provide ideas and push specialists to provide content. Train and encourage editors. "Crop Observation & Recommendation Network (C.O.R.N.) newsletter". Ver. 2019. OSU Extension Agronomic Crops Team, 2019. <http://corn.osu.edu> is sent regularly to about 5,000 subscribers and read on-line by as many as 25,000 web viewers.

#### Other Creative Works

1. Watters, H., Writer, original articles; reviewer for additional contributions. "C.O.R.N. to go..." AgriCommunications, Inc., Bart Johnson. Ohio's Country Journal. Print and online. Columbus, OH, United States. 2019. <http://ocj.com>.

- January: Ohio fall weed survey; Nitrogen concerns; CCA of the year; Winter agronomy meetings
- February: Ohio fall weed survey; Nutrient management update; Winter agronomy meetings
- March: Nitrogen recommendations for wheat; Had your auxin training yet; Fertilizer applicator record-keeping rules are in place; Nitrogen management for corn; Winter agronomy meetings
- April: Ways to make a buck on soybeans for 2019; Cover crop dos and don'ts; Fertilizer applicator certification do and don'ts
- May: Did you miss the Conservation Tillage Conference in March
- June: What are our concerns with crop production with a wet spring; How's your corn doing; Weed concerns; Crop insurance as part of your management strategy; Worried about nitrogen
- July: What a weird year; Nothing's perfect – can I fix it; OSU, OARDC and Extension agronomy field days
- August: Weird year continues; You need a cover crop; OSU, OARDC and Extension agronomy field days
- September: Farm Science Review is September 17, 18 and 19; 2019 wheat was better than expected; Agronomy calendar
- October: Lingering issues from 2019 – some thoughts for 2020; Weed answers for 2020 start this fall
- November: Are modern genetics worth the money; Fall tillage – is it necessary; Fall herbicide application is part of the plan for 2020 no-till soybeans; Do you have a favorite CCA
- December: 2019 Water quality update; CCA of the year; Winter programs

#### b. Research Funding:

- 04/2019 – 03/2020. Soybean issues educational programming. Ohio Soybean Council. (\$20,700, Total Award) Training Grant. GRT00055159; Project 60070143.
  - PI: LaBarge, G. Co-I: Watters, H.
- 04/2019 – 10/2019. In-kind company donations of product. \$5,000.

#### 4. Service

List of Editorships or Service as an Editorial Reviewer or Board Member for Journals, University Presses, or Other Learned Publications

- 2019 Crop Science. Review of CROP-2019-04-0278-ORA.R1 entitled "Impact of Cultivars and Environment Soil Suitability on the Contribution of Yield Components to Grain Yield Variation in Spring Wheat"
- 2017 – Present. Paul C. And Edna H. Warner Endowment Fund for Sustainable Agriculture, Grant reviewer.

List of Offices Held and Other Service to Professional Societies. List Organization in Which Office was Held or Service Performed. Describe Nature of Organization (Open or Elected Membership, Honorary)

- 2014 – Present. Member. American Society of Agronomy, Crop Management Professionals, Community Leaders, Madison, Wisconsin, United States.
- 2013 – Present. Member. American Society of Agronomy, Agronomic Production Systems, Climatology & Modeling, Education and Extension, Global Agronomy, Madison, Wisconsin, United States
- 2011 – Present. Member. Soil Science Society of America, S-4, Madison, Wisconsin, United States
- 2010 – Present. Ex Officio Member. Ohio Certified Crop Adviser Board, Columbus, Ohio, United States Invited member of Ohio CCA Board representing OSU Agronomic Crops Team.
  - Member of Tri-State CCA Exam review committee. Certified Professional Agronomist review committee member. Chair CCA of the Year committee
- 2009 – Present. Member. Crop Science Society of America, C-2, C-3, Madison, Wisconsin, United States
- 2019 CCA Career Accelerator Round Table participant. American Society of Agronomy. At Embracing the Digital Environment, 2019 ASA-CSSA-SSSA International Annual Meeting; Nov. 10-13; San Antonio, Texas.

#### Community Service

- 2019 – Present. Member of the Project Advisory Committee of the Upper Scioto River Watershed under the project lead of the American Farmland Trust. The project will facilitate an agricultural-municipal partnership focused on cleaner water and farmer/landowner profitability. (Invited member).
- 2014 – Present. Volunteer, Zoning Appeals Board, Liberty Township, Union County, Raymond, Ohio, United States.
  - Key Achievement: Chair of zoning appeals board. Met to evaluate appeals, usually based on soil drainage concerns.
- 2013 – Present. Volunteer, Northwestern Lions, Raymond, Ohio, United States.

#### Education

- 2019 M.S. thesis advisor for Brianna Matthies, Washington State University. Provided research site; assisted in collecting soil samples; discussed results of analysis and statistical procedures; participated in committee review 7May2019.
- 2012 – Present. Agronomy Education Task Force, Ohio AgriBusiness Association Industry Education Committee, Ohio AgriBusiness Association, Columbus, Ohio, United States.
  - Key Achievement: Participate as member to plan annual agronomic education programs.
  - Suggest program ideas, invite speakers, moderate sessions.

- 2016 – Present. Custom Applicator Education Task Force, Ohio AgriBusiness Association Industry Education Committee, Ohio AgriBusiness Association, Columbus, Ohio, United States.
  - Key Achievement: Developed, planned and hosted 2018 Farm Science Review Agronomy College.
- 2009 – Present. Lead for CCA programming, develop and moderate Soybean School, serve on Conservation Tillage Conference planning committee, Conservation Tillage Conference, Ada, Ohio, United States. <http://ctc.osu.edu>
  - Key Achievement: Planned the 2019 Soybean School.
  - Certified Crop Adviser continuing education lead. As a team we delivered over 3000 hours of continuing education to CCAs. Approximately 50% of the 850 attendees in 2019 were CCAs.

## Service

### a) Unit Committees

- 2005 – 2019. Farm Science Review Education Focus Committee, Invited Member

### b) College or University Committees

#### College

- 2015 – Present. Pesticide Education Program Advisory Committee. Invited member.
  - Provide input on fertilizer certification efforts.

#### Ohio Agricultural Research and Development Center

- 2009 – Present. Western Agricultural Research Station Advisory Committee, Invited Member
  - Notes: Provide management advice to station manager and to state-wide manager of outlying branches. Co-developed Western ARS Agronomy Field day with station manager.

### The Ohio State University

- 2007 – Present. Farm Science Program & Policy Committee, Invited Member
  - Notes: Advise Farm Science Review management on operations.

### d) Administrative Positions Held, e.g. Graduate Studies Chair

- 2004 – 2019. The Ohio State University. Agronomic Crops Team Coordinator, College of Food, Agricultural, and Environmental Sciences.
  - Summary: Co-coordinator of Agronomic Crops Team with Greg LaBarge. The Agronomic Crops Team is a group of 80; 50-60 are county Extension professionals and 20-25 are state specialists.

## 5. Awards

- 2019 Faculty Recognition Reception. Recognized for work with the international community on crop consulting.
- 2019 Certificate of Excellence for Extension Educational Materials Long Publications (17 pages or more) - 2nd place for "Corn, Soybean, Wheat, and Forage Field Guide"

## 8. Professional Development Goals for Upcoming Year

- Goal 1: Attend and present paper at professional society (American Society of Agronomy).

- Goal 2: Become more involved in “sustainable” agriculture programs and programming. Attend national conferences on cover crops, soil health and sustainability. Encourage Agronomic Crops team to understand and embrace new definitions for sustainability.
- Goal 3: Prepare and deliver agronomy and farm management program to Ukraine agronomists.

9. List of Planned Programs for Upcoming Year

- Agronomic Crop Fertilizer and Pesticide Education, 30 days planned
- Agronomic Crop Production - Winter updates & Field Days, 20 days planned
- Conservation Tillage Conference (CTC), 15 days planned
- Crop Observation & Recommendation Network (C.O.R.N.) newsletter and C.O.R.N. to go column, 20 days planned
- International Agriculture, 30 days planned
- Nutrient Stewardship for Agronomic Crops, 20 days planned
- Sustainable Agronomy, 15 days planned