

Developing An On-Farm Research Network

Wm. Bruce Clevenger, Extension Educator, Defiance, Ohio; Harold Watters, Ohio State University Extension, Urbana, OH



The Ohio State University Agronomic Crops Team is a multi-disciplinary group of County-based Extension Educators, State Specialists and Researchers from Ohio State University Extension, The Ohio State University and Ohio Agricultural Research and Development Center. The Team actively conducts on-farm research to improve farm profits, reduce environmental impact and increase agronomic crop production. A standing committee of the Agronomic Crops Team has provided leadership to establish communication and timelines to coordinate the overall efforts of the on-farm network. The network has been developed to provide planning, analysis, peer reviewing and reporting of applied research. The research protocols originate from locally driven needs and/or regional/state needs. The network includes 25 county-based Extension Educators working directly with cooperating farm operators, eight county-owned farms where Extension Educators conduct on-farm research and five university owned research facilities. The network utilizes team members for their strengths and specializations to fortify the research effort. This team input provides proper plot design, literature review of the research questions, personal experience, existing university data, statistical analysis, report writing, authoring professional publications and communicating results to midwest farm producers. The Agronomic Crops Team has been successful in obtaining support funding from the Ohio Soybean Council to provide payments to cooperating farm operators as well as coordinating input materials needed to conduct on-farm research. On-farm research conferences are published at the team's website, referenced in the Ohio Crop Observation and Recommendation Network (C.O.R.N.) newsletter and used at various agronomy conferences and meetings to educator farm operators.

Introduction

The OSU Extension Agronomic Crops Team is dedicated to producers and other clients with a passion to provide the knowledge and answers for productive and profitable agriculture. The team values serving as a conduit for bringing research findings to the field and for bringing researchable needs from the field to research colleagues. The team conducts applied research relevant to clients' needs for concerns facing Ohio's agronomic crop industry. A coordinated effort exists that combines people, farmland, and other resources to implement both proactive and reactive applied research.

The scope of the Agronomic Crops Team Applied Research resources involve county farms, private farmer cooperators and university owned facilities.

–Five (5) university research stations with emphasis on agronomic crop research on nearly 1,000 acres are used for applied research.

–Eight (8) county-based applied research farms with over 630 tillable acres are used for applied research.

–Twenty-four (24) county extension educators conduct applied research with over 80 farm cooperators throughout Ohio.

–100% of the county extension plots have access to scale wagons or GPS yield monitors to measure crop yields.

–90% have access to scale wagons while 74% have GPS yield monitors.

Research protocols are peer reviewed and use a scientific design that accounts for extraneous variables.

–Research reports are peer reviewed and published annually by Ohio State University Extension and the Agronomic Crops Team.

–Applied research committee includes a multi-discipline group of university faculty and staff monitoring the needs of Ohio crop farmers.

–For current and archived On-Farm Research Reports or more information, please visit <http://lagrcrops.osu.edu> or your local OSU Extension county office.

Research Protocols and Peer Reviewed Reports

Agronomic Crops Team	
Calendar for Applied Research Protocols	
Fall Harvest Crop October 1 and 15	Ag Crops Team sends request to ALL AGNR to solicit applied research ideas for the following spring planting or summer applied treatments.
November 1	Preliminary protocols due to applied research committee.
November mid to late	Applied research committee peer reviews the objectives, design and impacts expected.
December 1	Release applied research protocols to ALL AGNR.
Summer Harvest Crops June 1 and 15	
Ag Crops Team sends request to ALL AGNR to solicit applied research ideas for summer and/or fall planting or applied treatments on wheat, cover crops, legumes.	
July 1	Preliminary protocols due to applied research committee.
July mid to late	Applied research committee peer reviews the objectives, design and impacts expected.
August 1	Release applied research protocols to ALL AGNR.
Calendar for Applied Research Reports	
Fall Harvest Crop December 1	Preliminary reports submitted to applied research committee.
December mid to late	Applied research committee peer reviews the report and provides feedback and coaching to author.
February 1	Applied research reports published by the Agronomic Crops Team.
Summer Harvest Crops August 1	
Preliminary reports submitted to applied research committee.	
August mid to late	Applied research committee peer reviews the report and provides feedback and coaching to author.
September 1	Applied research reports published by the Agronomic Crops Team.

Conclusions

- helps keep us in contact with clientele
 - confirms work done in small plots at the research stations
 - keeps us in contact with state specialists
 - increases capacity of university research
 - locate pests not found on research stations – e.g. WBCW, aphids, GLS
 - aids in search for answers – more sets of eyes
 - conditions are what grower faces
 - more variability – sometimes leads to different observation
- Valuable to the grower, the educator, the Team and the University
Leads to future political and financial support*

For further information: clevenger.10@osu.edu or watters.35@osu.edu

Results

Manure and Commercial Fertilizer Comparison

Alan Sodenmeyer, Ohio State University Extension Educator, Agriculture & Natural Resources
Jan Karch, Ohio State University Extension Educator, Agriculture & Natural Resources
Amanda Madril, Ohio State University Extension, Program Coordinator, Manure Management

Objective
To evaluate the response of corn from a reduced application of manure compared to commercial fertilizer.

Component	Value	Source
Cooperator	Paul Hestepfeler	OSU
County	Walsh	OSU
Location	Walsh	OSU
Soil Type	Typical well-drained	OSU
Soil Type	Typical well-drained	OSU
Soil Type	Typical well-drained	OSU
Soil Type	Typical well-drained	OSU
Soil Type	Typical well-drained	OSU

Methods
The studies were replicated from three to a completely randomized block design. Harvest data was collected from the entire and all treatments received the same tillage, herbicide and pest control. Comparison from manure application versus additional fertilizer different due to 40% soil at the time.

Results
Soil moisture levels that supply adequate amounts of nitrogen at similar levels that are sufficient range from 750 – 2400 ppm.

Evaluation of GreenYield™ Effect on Wheat Yields

Wm. Bruce Clevenger, Agriculture & Natural Resources Extension Educator

Objective
To evaluate an application of GreenYield™, a bio-based cleaning wash, on the effect of wheat yield in no-till locations and row wheat locations.

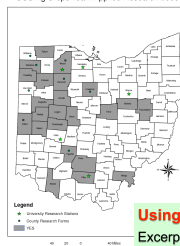
Year	Cooperator	Location	Harvest Date
2009	Louis Stanger	Defiance/OSU	Field 250/10/26/29 w/ 20 to the ASIS, Ma 24 15 gal 20 N, and 25 15 gal 20% N
2010	Louis Stanger	Defiance/OSU	Field 250/10/26/29 w/ 20 to the ASIS, Ma 24 15 gal 20 N, and 25 15 gal 20% N
2011	Louis Stanger	Defiance/OSU	Field 250/10/26/29 w/ 20 to the ASIS, Ma 24 15 gal 20 N, and 25 15 gal 20% N
2012	Louis Stanger	Defiance/OSU	Field 250/10/26/29 w/ 20 to the ASIS, Ma 24 15 gal 20 N, and 25 15 gal 20% N

Methods
This study was a split plot design with the number of treatment replicates varied by field location and site. Plots were grouped by wheat variety at each field location with split plot treatments replicated within each group. Split plot treatments included GreenYield™ and non-treated control.

1. Field 1 - Variety: Bronson - 3 reps of GreenYield™ and non-treated control
2. Field 2 - Variety: Bronson - 3 reps of GreenYield™ and non-treated control
3. Field 2 - Variety: Bronson - 3 reps of GreenYield™ and non-treated control

GreenYield™ was applied on April 21, 2009 at Feeder when growth stage 4.5 at product rate of 4 oz/ac with 10 gallons of water. The cooperator used an 8V, pull-type sprayer with 45-foot boom, making two passes for a 90-foot treatment plot. Application was equipped with a GPS guidance system and flat fan nozzles. Harvest was with the center 30-foot of the treatment plot. Yield was measured using the cooperator's combine equipped with an Ag Leader™ yield monitor and by the OSU Extension office using SMS Ag Leader™ software. Grain moisture was taken from the yield monitor average readings for each plot. All yield data were adjusted to 15% moisture.

OSU Ag Crops Team Applied Research 2008



Using Clientele Focus Groups...

Excerpt from 2009 summary:

- 3 - How do you obtain agronomic information? (web, newsletters, company representatives, OSU Agronomy Programs, Extension Educator others?)
 - Local ag retailer, CORN, state specialists, ag educators, various websites
- 4 - How would you prefer to obtain information? Do you currently use blogs or twitter?
 - In an electronic format. Also appreciate phone access to state specialists and educators
- 5 - Explain the value of non-biased agronomic information to your operation?
 - Huge, Extremely important. Purdue and OSUE partnership is win-win. Trust extension.
- 6 - What applied agricultural research projects would you suggest the OSU Agronomic Crops Team consider?
 - Seed technology, seed treatments, fertility, tillage, precision agriculture, insect damage and thresholds for stink bugs.

Applied Research Needs in Ohio for 2009

1. Current Needs
2. Emerging Issues
3. New (future) issues
4. Scouting/Monitoring Efforts

1. Current needs

- Fungicide Use (corn, wheat, soybean)
 - soybean (done that)
 - scouting records to explain the results (ie. disease ratings)
 - records of genetics used in the trial
- Soil Fertility
 - nitrogen – sources, placement, timing
 - phosphorus
 - strip tillage w/ deep, band placement
 - potassium
 - alternative sources of N-P-K (ie. by-product etc)
 - manure – yield, value, application equipment
 - nutrient (P&K) losses – crop removal, straw removal, manure loss or runoff.
- Precision Ag
 - soil sampling by grid, soil type, management (yield) zones, whole field average
- Cover Crops
 - need state-wide coordination of all results and outreach due to results variability
 - soil quality (biological, physical, chemical measurements)
 - increased OM = improved or stabilize crop yields?
 - adaptation research and demonstrations
 - nutrients supplied vs. captured
 - economics
 - profitability
 - forage opportunities
- Tillage
 - no-till, reduced tillage
 - rotations (the value of wheat in the rotation)
 - fertilizer placement with tillage
 - compaction
- Ag Equipment
 - aftermarket add-ons
 - basic set-up
 - calibration
- Double crops
 - flying on double crop beans
 - oil seed crops
 - gross income per acre per year
- Narrow row corn
 - population
 - hybrid selection
 - orientation N-S
- Alternative rotations
 - oil crops
 - crops after silage corn or field corn
 - cellulose crops
- RR 2 soybean gene
 - cost will be \$60/bag (economic question)
 - seeding rate studies
- Soybean cyst nematode
 - resistance efficacy
- Wheat
 - insecticide 30 DAP by date of planting
 - Cruiser seed treatment
 - wide rows, twin rows
 - seeding rates
 - N – sources, inhibitors
 - coated N applied in Jan – heat released
 - new OSU wheat varieties
 - validity of the hessian fly dates
- ng issues
 - western bean cutworm
 - non-GMO and using bin run and by-pass tech expenses
 - patented non-GMO seed use restrictions
 - tools when growing non-GMO
 - water quality
 - P-loss (stratification in no-tillage)
 - N-loss (drainage, controlled drainage)
 - Losses from non-corn acres (ie soybean, forages)
 - carbon sequestration
 - carbon credits
3. New (future) issues
 - controlling western bean cutworm
 - economics of irrigation in Ohio – overhead, subirrigation
 - coated ammonium nitrate – less explosive (Univ. of Kentucky)
 - insect resistant management changes in refuge
 - develop an environment where Ag Industry (R&D) would or continue to bring ideas to the nitrogen game
 - nitrogen game
 - Scouting/monitoring efforts
 - western corn rootworm variant (central and eastern Ohio)
 - Asian soybean rust
 - western bean cutworm
 - soybean aphid
 - fusarium head scab
 - phytophthora root rot
 - pythium
 - weed resistance