THE OHIO STATE UNIVERSITY

COLLEGE OF FOOD, AGRICULTURAL, AND ENVIRONMENTAL SCIENCES

Outreach to the Ag Community

Understanding the Nutrient-HAB Linkage and Solutions

Greg LaBarge

Associate Professor and Field Specialist, Agronomic Systems

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OHIO STATE UNIVERSITY EXTENSION

OHIO AGRICULTURAL RESEARCH AND DEVELOPMENT CENTER

Source: www.farmflavor.com


What are the science based solutions I can implement my farm that improve yield and protect resources?
Source: www.farmflavor.com

A comprehensive outreach framework:

1. Regulations statewide and targeted (some with required educational components)
2. Supporting program
3. Farmer Engagement

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   - Regulations related to manure
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Disclaimer

- I am providing a listing on regulations that exist in the state of Ohio related to agricultural runoff of nutrients, soil erosion and application of nutrient sources.
- This is to provide a context to this audience on to outreach efforts and engagement with farmers as affected by these regulations.
- I also want the scientific community in the to have some general sense of the current regulations they can consult in detail later.
- Those wanting changes in regulations will want to consult with the legislative bodies in the state.

Regulation Related to Manure (Statewide)

- Ohio Agricultural Pollution Abatement Laws (Ohio Department of Agriculture (ODA))
  - All livestock facilities or manure application fall under these standards.
- Ohio Livestock Environmental Permitting (ODA)
  - Based on size of operation need to obtain permits.
- National Pollutant Discharge Elimination System Permits (Ohio EPA)
- Certified Livestock Managers (ODA)
  - Applicators of more that 4500 ton or 25 million gallons must undergo training and recertification

http://go.osu.edu/manureregulations or Ohio Agency listed above

Fertilizer Applicator Certification Training (Statewide)

- Certification required by 9/30/17 for fertilizer applicators who apply nitrogen, phosphorus or potassium to 50 or more acres of agricultural production.
- **Ohio Department of Ag** is the issuing authority SB 150 (2014)
- **Ohio State University Extension** delivers 3 hour educational Sessions
- Since September, 2014 total of 12,600 participated in 200+ sessions
- CEU's required to maintain certification renewed every 3 years


FERTILIZER APPLICATOR CERTIFICATE
ID# 102734
Certificate Expires: 3/31/2018
DEPARTMENT OF AGRICULTURE STATE OF OHIO
MATTHEW L BEAL
8995 E MAIN ST
REYNOLDSBURG, OH 43068
Recertification Cycle: 4/1/2015 to 3/31/2018
Certificate Signature

What is covered in Training?

1. Current rules for certification
2. Nutrient Enrichment effects on Water Quality
3. Quality in Soil Testing
4. Phosphorus Management for Yield and Water Quality
5. Nitrogen Management

Materials used posted at: http://go.osu.edu/FACT

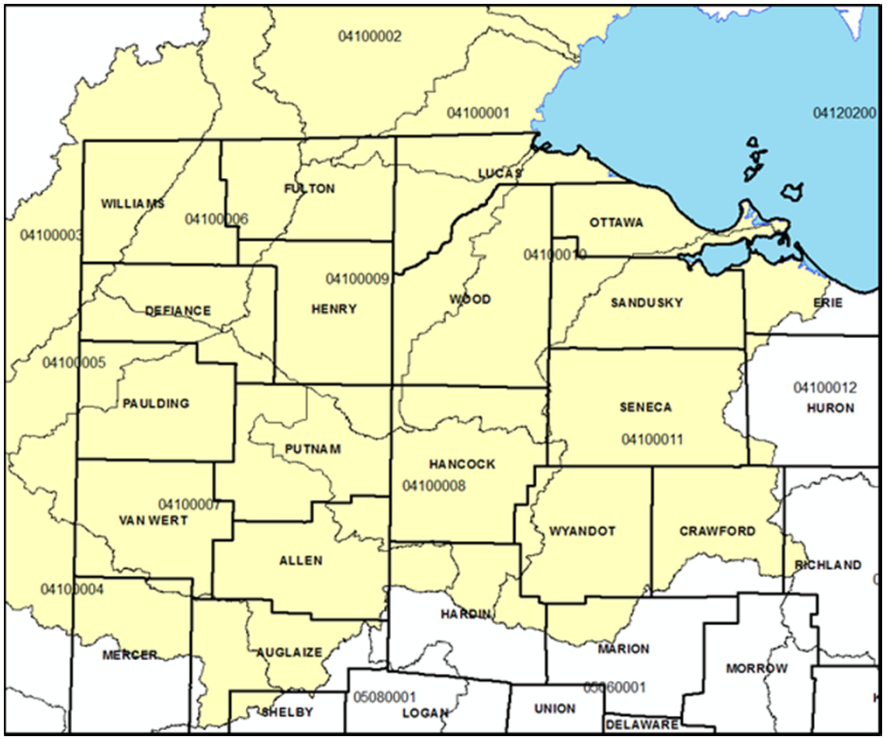
Survey results from the training tell us…

- 3677 Surveys summarized
- 16% had not attended OSUE programs in the past

Question	Agree or Strongly Agree % answering
Farm P is a significant problem to water quality	74
I have improved my knowledge	91
I will change my Nutrient Management practices	56

Application Regulations (WLEB only)

- Applies to Manure & Granular Fertilizer containing Phosphorus & Nitrogen:
  1. **No** application to frozen, snow covered soil
  2. **No** application when top 2 inches of soil is saturated
  3. **Consult** rainfall forecast before application. **Do not apply if:**



http://go.osu.edu/applicationregulations

Nutrient Source	Forecast period after application	Predicted rainfall exceeds
Manure	24 hour	0.5 inches
Fertilizer N&P	12 hour	1.0 inches

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4R NUTRIENT STEWARDSHIP CERTIFICATION PROGRAM

Western Lake Erie Basin - Ohio, Michigan & Indiana

Voluntary program for agricultural retailers & nutrient service providers implementing the 4Rs

GOALS

Maximize crop nutrient uptake and minimize crop loss

Positvely impact local water bodies

Provide up-to-date information on nutrient stewardship

Help the agricultural sector adapt to new research and technology

REQUIREMENTS

Initial training and on-going education

Monitoring of 4R implementation

Nutrient recommendation and application

THIRD-PARTY VERIFIED

Audits review training and education, recommendations to growers and application records

Third-party auditor verification occurs each year

For more information, visit 4rcertified.org

RIGHT SOURCE - RIGHT RATE - RIGHT TIME - RIGHT PLACE

http://4rcertified.org/

4R Nutrient Stewardship Certification Program

Current status

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   - Farmer DRP Water Quality Monitoring
   - Nutrient Management Plans
   - Best Management Practice Website

Farmer DRP Water Quality Monitoring

Diffusive Gradient Thin Film device

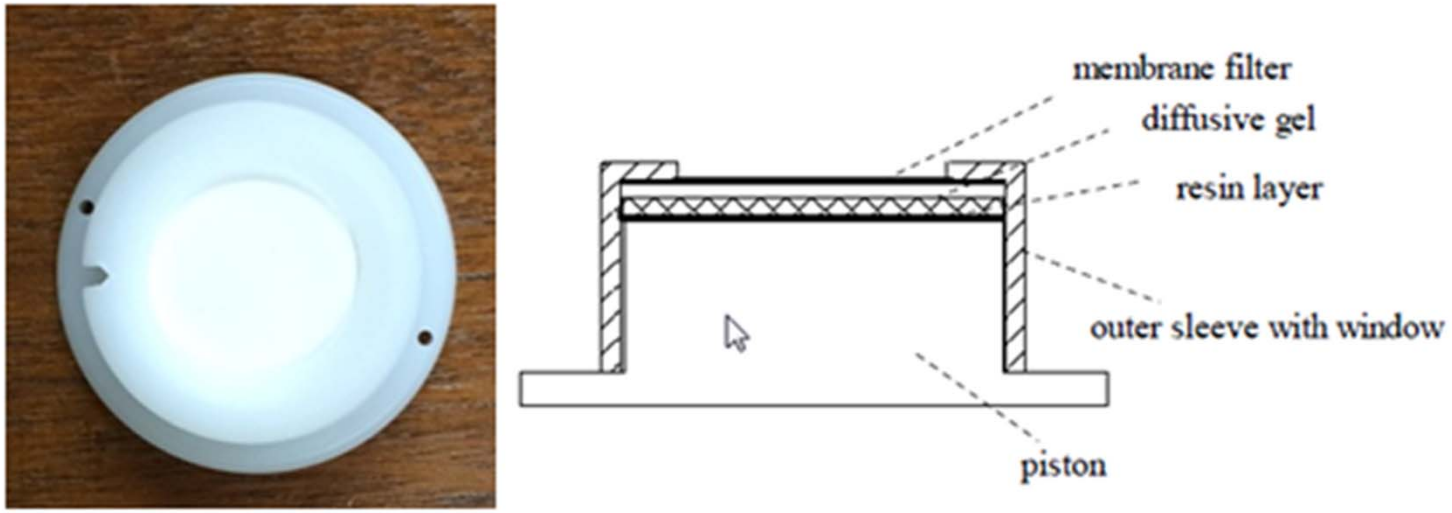
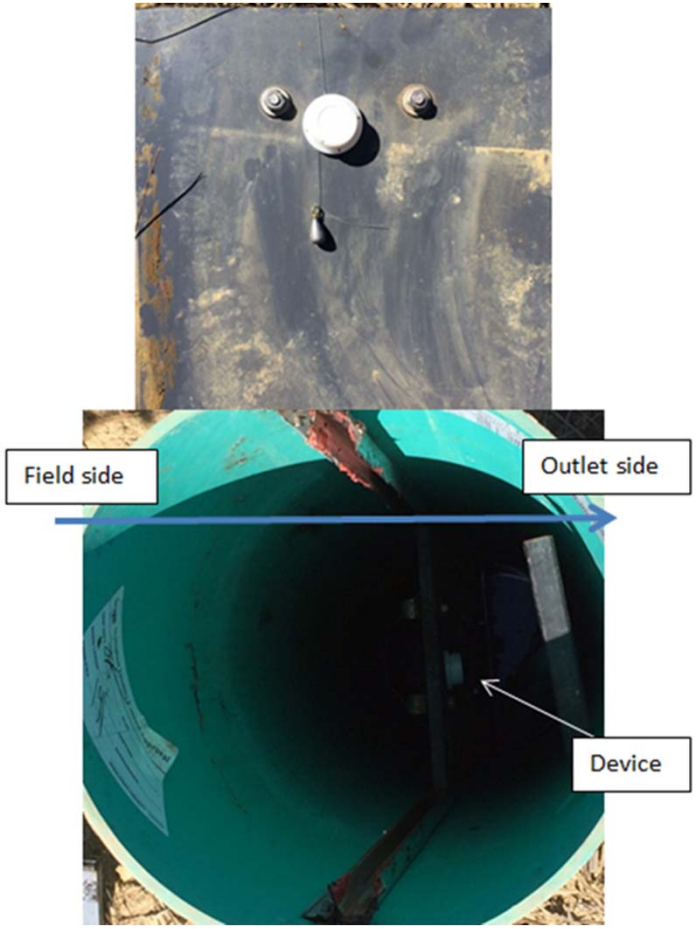


Figure 1. Actual device showing plastic body and filter actual size is 2.5 cm or 1 inch (Left). Note gel is below the filter. Drawing with components (right).

For DRP measurements the gel is Fe-oxide

Farmer DRP Water Quality Monitoring

Placed in tile outlets or drainage control structures



Farmer DRP Water Quality Monitoring

Sampling Periods and participation

Sample Target Period	Year	Distributed	Collected	Farmers	Fields	Acres
9/1 to 11/30	2015	August	December	35	45	1605
3/15 to 6/30	2016	March	June	93	135	4725
10/1 to 12/30	2016	September	December			
3/15 to 6/30	2017	March	June			

Farmer DRP Water Quality Monitoring

Results Fall 2015

		Average		Concentration Range	
Sample Period	Days Deployed	Total Mass DRP (ug)	Concentration (ppm)	Low (ppm)	High (ppm)
1	31	5	0.011	ND	0.047
2	28	2	0.006	ND	0.026
3	25	2	0.007	ND	0.050

Compare to:

- Management
- Soil Test Levels of P

Nutrient Management Plans

Plan that identified crop nutrient needs and environmental risk for erosion and nutrients losses.

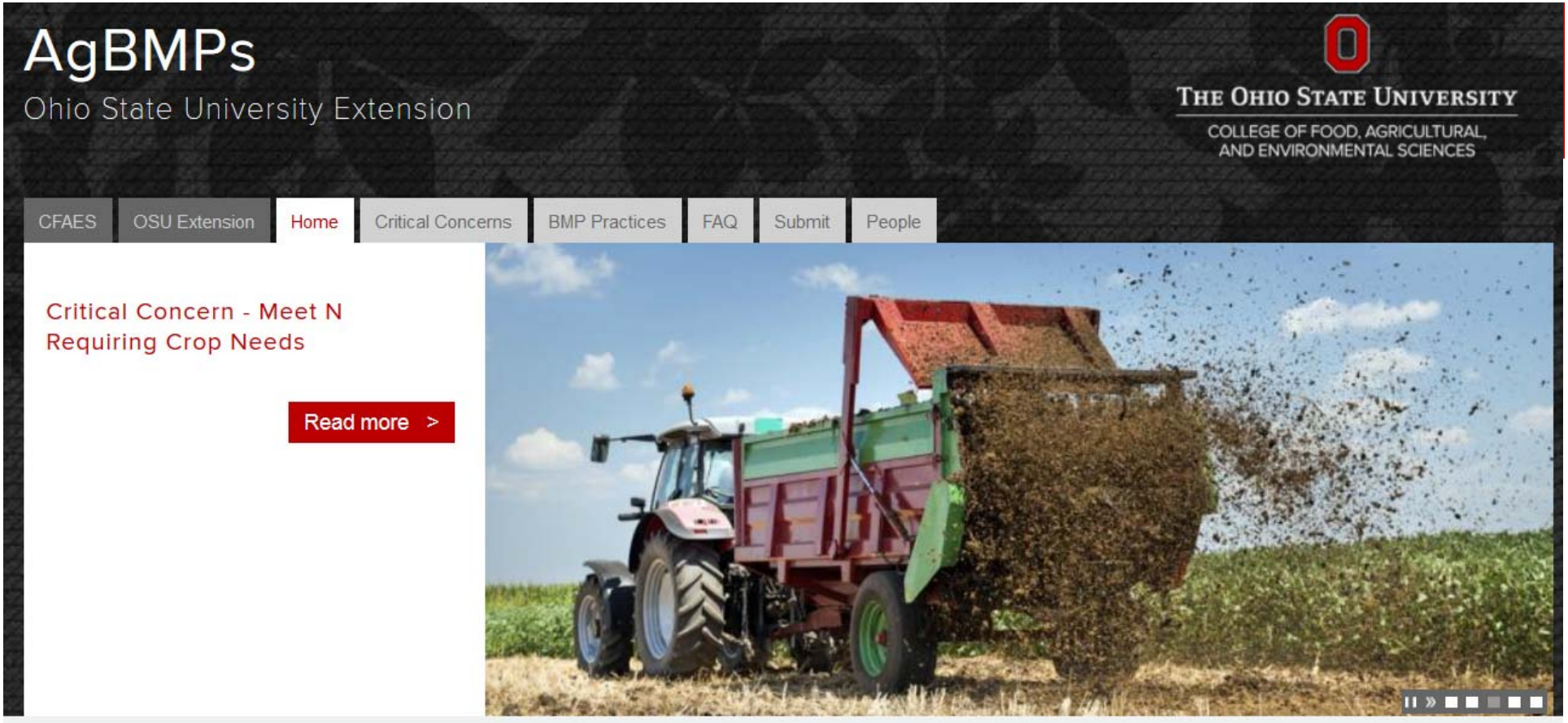
- Used as basis for resource concerns identification and BMP practice implementation for cost share programs
- Self implementation of practices for yield and BMP's
- Use for other assurance programs

BMP's often identified are:

- 4R practices
- Water control practices
- Soil carbon

Sources of Nutrient Management Plans

- OSU Extension
- Technical Service Providers
- Ag Retailers
- Soil and Water Conservation Districts



What you will find

Critical Concerns- Pictures and descriptions of critical resource concerns.

BMP Practices- A listing of all BMP practices.

FAQ- Frequently Asked Questions- Answers to common questions.

Submit- Submit pictures of critical concerns or BMP's in action or questions for FAQ.

People- People that can assist in answering questions.

http://agbmps.osu.edu

Ag BMP's Website

Resource for farmers and professionals

- Decision Tree with entry points from NMP plan outcomes (P Index value) or description of concern

For each BMP

- Description
- Effectiveness in addressing water quality concerns
- Potential to affect other factors (unintended consequences)
- Cost
- Key management
- Design tools
- Technical References

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