

# Fertilizer Applicator Training- Impact Evaluation

Amanda Douridas<sup>1</sup>, Mary Griffith<sup>1</sup>, John Schoenhals<sup>2</sup>, Edwin Lentz<sup>1</sup>, Mimi Rose<sup>1</sup>

<sup>1</sup> Ohio State University Extension, <sup>2</sup> Pioneer

## INTRODUCTION

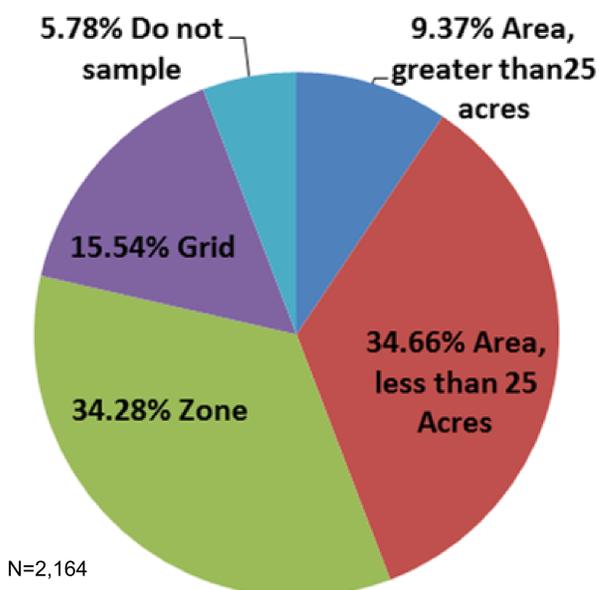
Harmful Algal Blooms (HABs) in Lake Erie have brought attention to phosphorus (P) use on farm fields across Ohio. In 2014, Ohio's 4<sup>th</sup> largest city, Toledo, had to cut off the drinking water supply because toxins from the HABs were too high for safe consumption. Legislation was passed requiring a three hour fertilizer certification training for anyone applying fertilizer to more than 50 acres [20.23 hectares]. Initial training occurred from September 2014 through September 2017. Ohio State University Extension Educators certified 16,501 applicators during this time and 4,126 anonymous and voluntary surveys were collected. Using the survey data, analysis of farmer management practices and water quality perceptions was conducted using R.

### Number of surveys collected by region in Ohio.



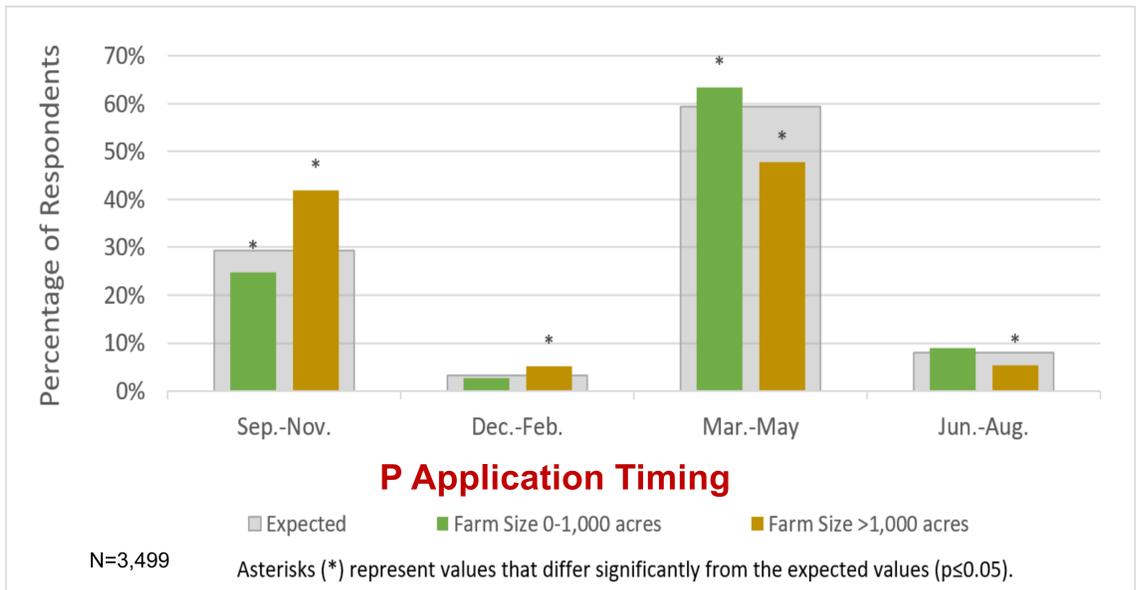
These regions were determined from regional differences in geography, watersheds, soil types and farming practices. The Northwest region contains the Lake Erie Watershed. Three counties of 24 in the Southwest region fall in the Grand Lake St. Marys watershed that has dealt with HABs approximately 5 years prior to Lake Erie. The East region is made up of smaller, more diversified farms in the foothills of the Appalachian Mountains.

### Soil Sample Method



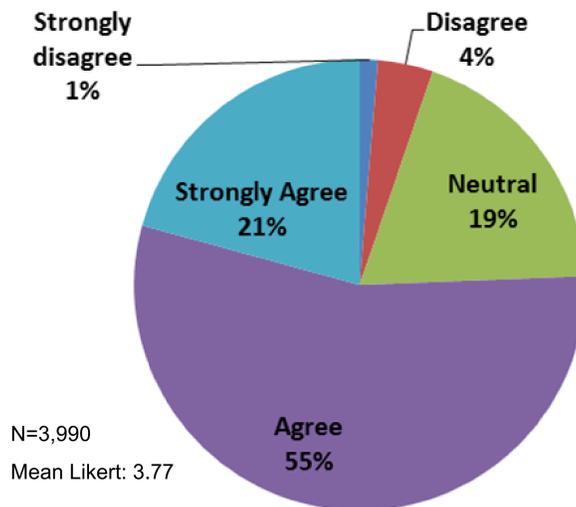
N=2,164

Larger farms, > 1,000 acres [404.7 hectares], indicated a higher use of grid sampling at 48.5% compared with 28.9 % of farms under 1,000 acres. Overall 58% of farms sampled every 2-3 years.



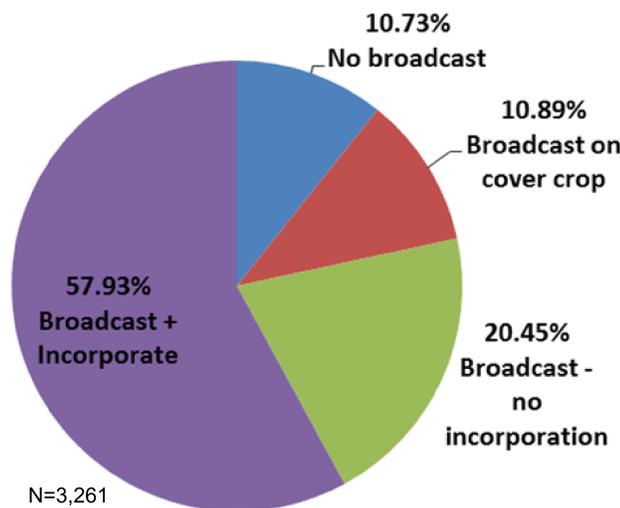
Larger farms had higher rates of P application in the fall because of drier weather and more time. However, these nutrients are at a greater risk for loss through run-off.

### 73 % agree farm field P loss is a problem.



N=3,990  
Mean Likert: 3.77

### P Application Method



N=3,261

Most farms are using broadcast applications to apply P. Nearly 80% are taking measures to reduce nutrient loss through incorporation, cover crops or other application methods.

## METHODS

Likert scale ratings for level of agreement with several statements were analyzed with respect to various demographic factors using the Kruskal-Wallis rank sum test (p=0.05) followed by a multiple comparison test (p=0.05). Chi-Square analyses (p=0.05), followed by post-hoc tests, were used to analyze results of multiple-choice questions.

Respondents were grouped based on education level (high school or college), size of farm (less than 1,000 acres or greater than 1,000 acres), and region of residence (northwest, southwest, or east).

## CONCLUSIONS

As a result of the training, 55% of respondents indicated a plan to change their management practices.

Focus areas of education needs:

1. Alternative fertilizer application windows to reduce fall application.
2. Application methods that include injection or incorporation.
3. Continued literacy of soil test results to reduce over-application.

Larger farms need an efficient way to apply fertilizer in the spring or early summer so they can move away from fall application. Fall application leaves the highly soluble nutrients exposed to a lot of wet weather making them more likely to runoff and enter water sources.

Broadcasting nutrients is the fastest way to apply but also comes with the highest level of risk. Educating farmers on alternative application methods or the importance of incorporation after broadcasting will help keep more nutrients on the fields.

Farmers are aware that phosphorus is a water quality issue and most are willing to make some changes to combat the issue. This are two key steps towards improving water quality in Ohio.

## BIBLIOGRAPHY

Griffith, M., Schoenhals, J., Douridas, A., Lentz, E., & Rose, M. (2017). Impact of Fertilizer Applicator Certification Training (FACT) Programs on Producer Perceptions and Practices in Ohio. *Journal of the NACAA*, 10(2). Retrieved February 4, 2019, from <https://www.nacaa.com/journal/index.php?jid=779>.