Harmful Algal Blooms (HABs) in Lake Erie have brought attention to phosphorus (P) use on farm fields across Ohio. In 2014, Ohio’s 4th 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.

### 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 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.

### Soil Sample Method

<table>
<thead>
<tr>
<th>Sample Method</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do not sample</td>
<td>5.78%</td>
</tr>
<tr>
<td>Greater than 25 acres</td>
<td>9.37%</td>
</tr>
<tr>
<td>Less than 25 acres</td>
<td>34.66%</td>
</tr>
<tr>
<td>Grid</td>
<td>15.54%</td>
</tr>
</tbody>
</table>

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.

### P Application Method

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.

BIBLIOGRAPHY