OHIO AGRICULTURE CONSERVATION INITIATIVE ASSESSMENT REPORT:

Western Lake Erie Basin

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OHIO AGRICULTURE CONSERVATION INITIATIVE ASSESSMENT REPORT — WESTERN LAKE ERIE BASIN

The Western Lake Erie Basin (WLEB) encompasses nearly 6 million acres of land drained by the Maumee, Portage and Ottawa Rivers, spanning 29 counties in Ohio, Michigan and Indiana. In 2025, the Ohio Agriculture Conservation Initiative (OACI) conducted a randomized sampling of 464 crop production fields within the WLEB. Fields only in Ohio were considered in this survey. This marks the first time OACI has surveyed all of the Ohio counties within the WLEB. A statistical approach was implemented to determine what practices are being used by Ohio farmers within this watershed to manage water and nutrients in the crop year 2024.

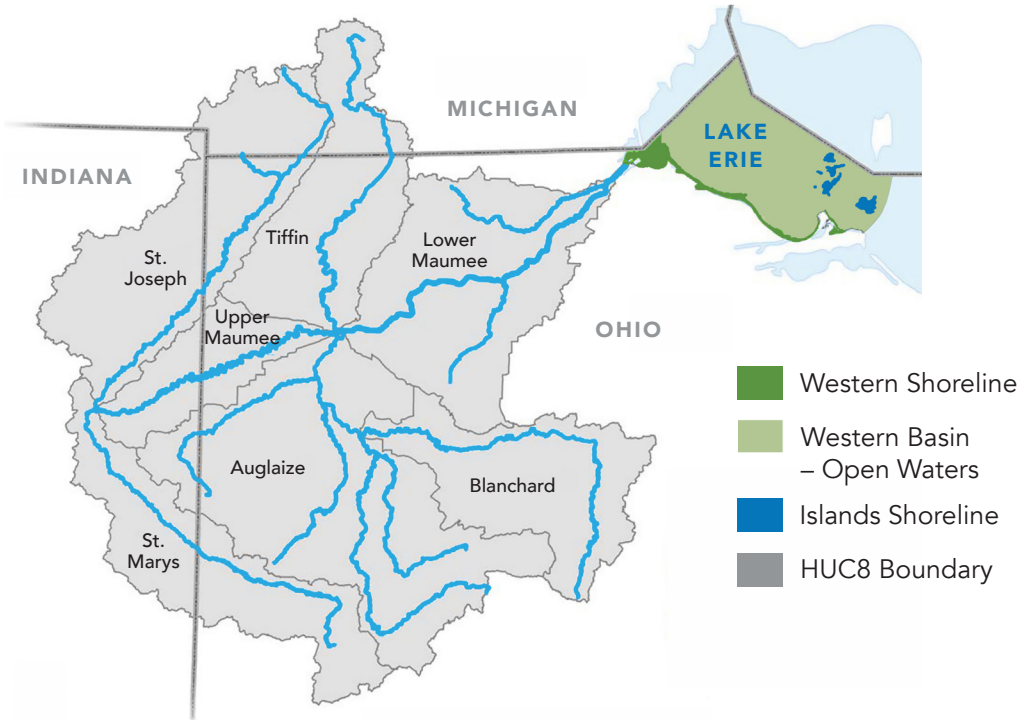
In the field survey process, all the Ohio crop fields within the watershed were considered in the randomized selection process, regardless of farm and field size. However, only fields that were greater than or equal to 20 acres were selected for the survey; the average size of the fields surveyed was 56.5 acres. A trained Soil and Water Conservation District employee interviewed the landowner or farm manager for each field surveyed. The Ohio State University and the Center for Survey Statistics and Methodology at Iowa State University helped in designing the sampling strategy and data analysis.

These survey results establish a baseline of current adoption of agricultural best management practices (BMPs). A follow-up assessment of crop production fields within the WLEB is planned, methodology may change.

Fields Surveyed Per County

COUNTY	COMPLETED FIELDS	COUNTY	COMPLETED FIELDS
Allen	20	Mercer	12
Auglaize	35	Ottawa	15
Crawford	19	Paulding	20
Defiance	24	Putnam	35
Erie	5	Sandusky	21
Fulton	21	Seneca	40
Hancock	10	Shelby	6
Hardin	13	Van Wert	22
Henry	25	Williams	25
Huron	5	Wood	55
Lucas	7	Wyandot	23
Marion	6	**Total**	**464**

Western Lake Erie Basin Map



KEY FINDINGS

- Approximately **68% of the fields surveyed were currently enrolled in a cost share conservation program**, including both state and federal level programs. 62% of these are enrolled in H2Ohio.
- The assessment found that most farmers were testing their soil, with **97% of the surveyed fields being sampled at least once every four years**. The vast majority of soil samples (85%) were completed using precision agriculture, via grid or zone methods.
- Approximately **51% of fields surveyed had phosphorus applied using variable-rate technology** (VRT); 23% of fields had nitrogen applied using VRT.
- Nearly **64% of the fields were either no-tilled or minimally-tilled**.
- The assessment found that **59% of the farmland assessed was owned by the farmer** and 41% was in a lease.
- Field familiarity is very high as **97% of the fields were managed by the farmer for three years or longer** with only 3% being farmed less than three years.
- Farmers **utilized fertilizer retailers and crop consultants to create fertilizer recommendations for 89% of fields** surveyed.

COST SHARE PROGRAM ENROLLMENT

68% of the fields in the watershed at the time they were surveyed were enrolled in a cost-share conservation program, including local, state and federal level programs, with 62% of those acres enrolled in H2Ohio.

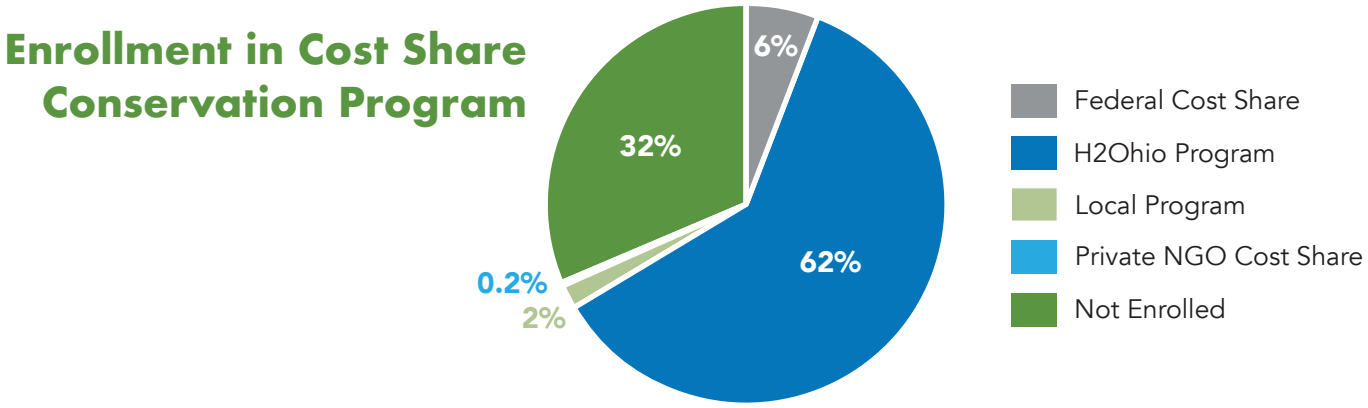


Figure 1. Summary of fields enrolled in conservation cost-shared programs

ACRES FARMED AND OWNERSHIP STATUS

The results indicated that the fields surveyed were being managed by farmers with a wide range of operation sizes (Figure 2). The fields surveyed were being managed by farmers broken down into six size categories of 0–500, 500–1,000, 1,000–2,500, 2,500–5,000, 5,000–10,000, and >10,000 acres.

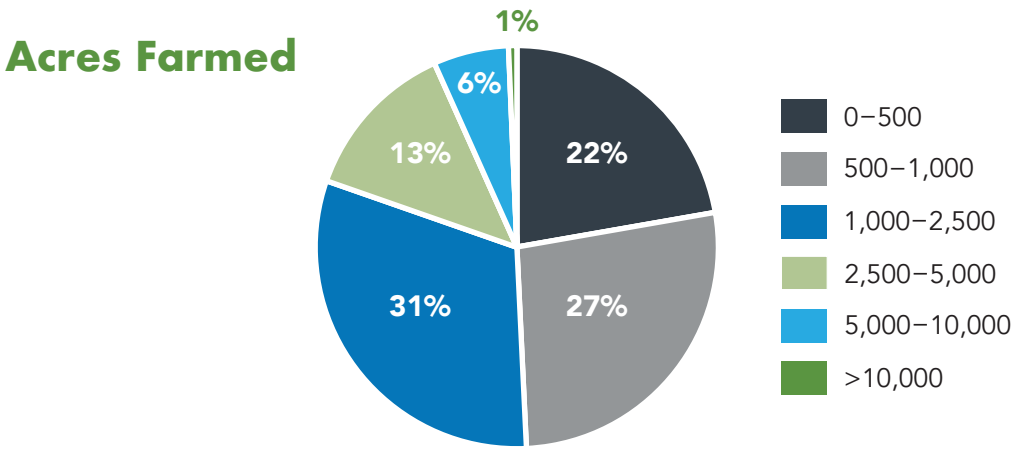


Figure 2. Distribution of number of acres farmed by farmers managing the fields surveyed

Figure 3 summarizes the ownership status of the fields with 59% being owned by the farmer or the farm family and 41% being leased, either in a long term (>1 year) or short term (year-to-year) lease. Farm ownership status is an important factor in the in-field decisions a farmer makes throughout the growing season. Farmers are often reluctant to make conservation decisions that require large investments or physical changes to the field without knowing they will be farming the field for a long period.

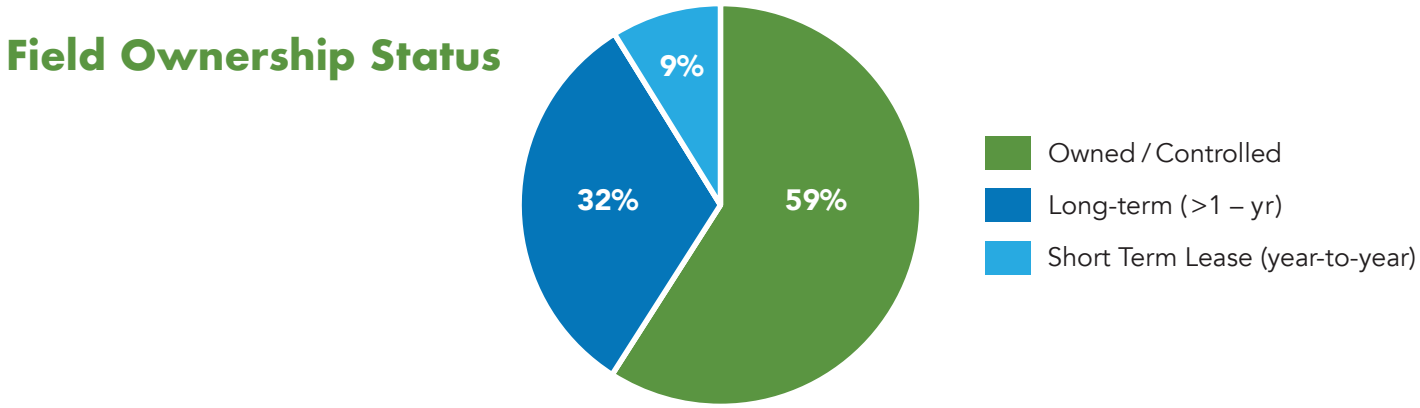


Figure 3. Percentage of surveyed fields that were leased versus owned

Figure 4 indicates 97% of the fields were managed by the farmer for three years or longer with only 3% being managed by the farmer for less than three years.

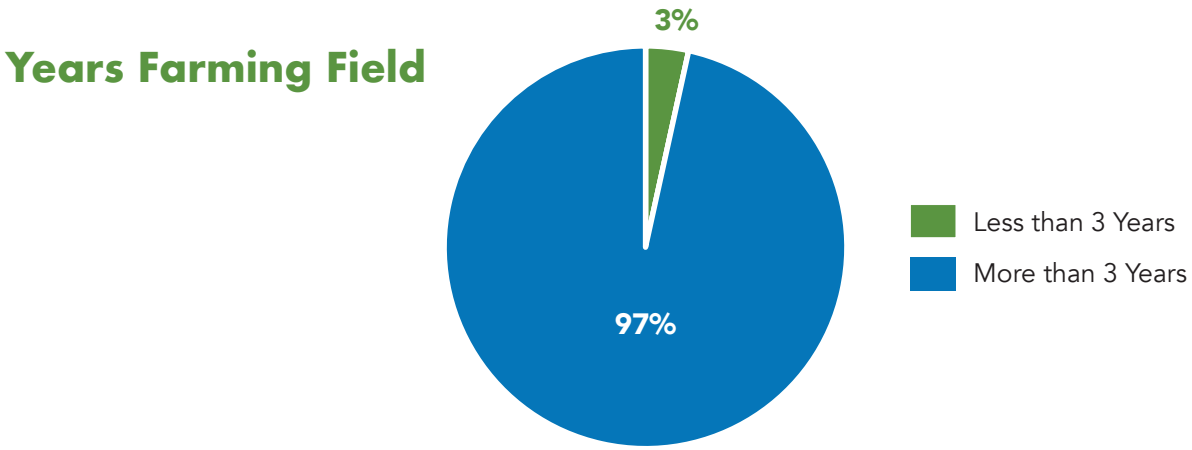


Figure 4. Summary of how long surveyed fields had been managed by the same farmer

TILLAGE TYPE

Figure 5 notes the type of tillage being used on fields surveyed in the WLEB with farmers using rotational tillage on 19% of fields. Approximately 71% of the fields were no-tilled, minimally-tilled or strip-tilled (Figure 5).

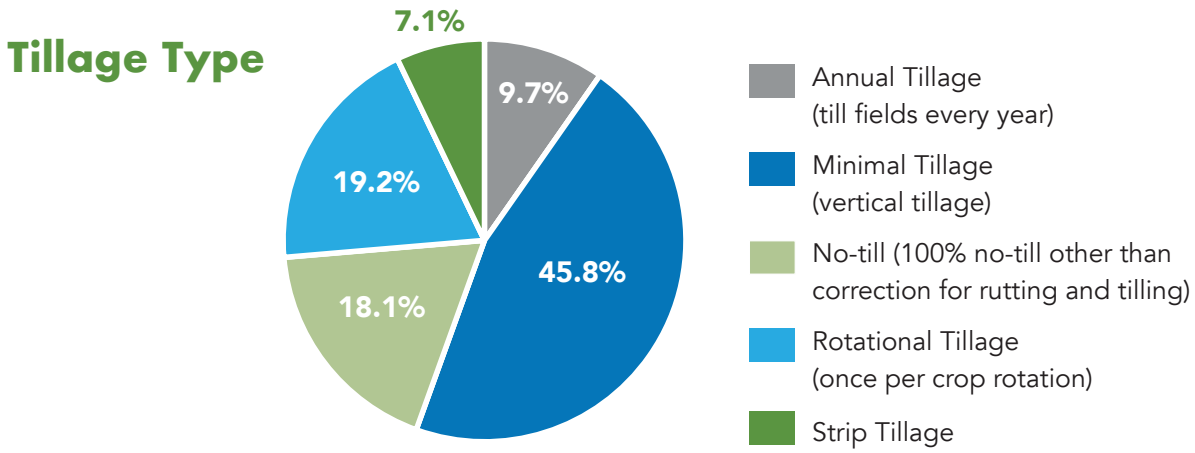


Figure 5. Type of tillage being used by farmers on surveyed fields

NUTRIENT MANAGEMENT AND RECOMMENDATIONS

Commercial fertilizer represents the primary nutrient source (76.5%) used in the WLEB (Figure 6). While the data doesn't indicate the reason for greater manure use in this watershed, we suspect farmers are choosing to use organic phosphorus first before purchasing commercial fertilizers to help better manage their fertilizer prices and take advantage of manure nutrients within their nutrient management plans.

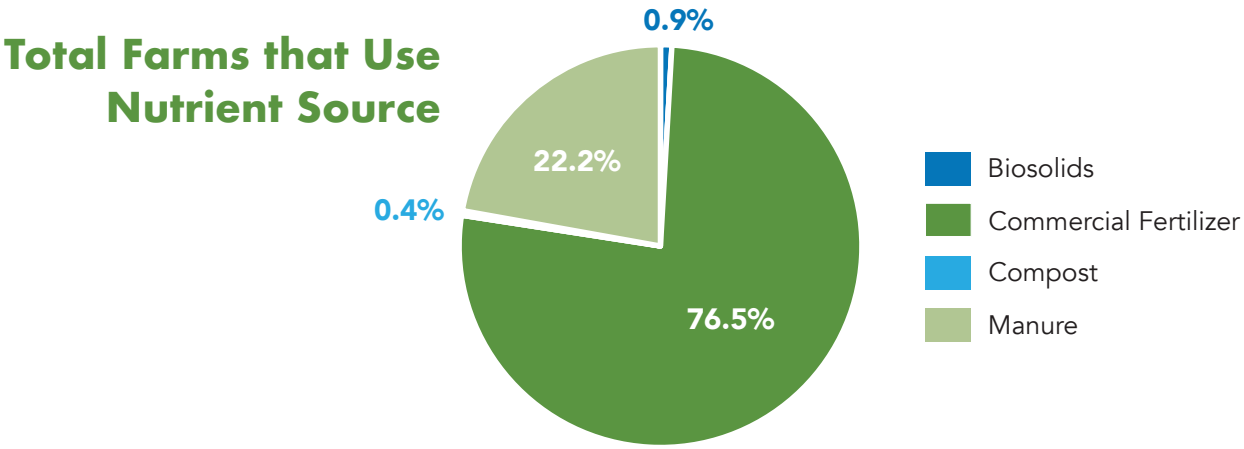


Figure 6. Distribution of nutrient sources across surveyed fields

In the WLEB, 97% of the fields surveyed were soil-tested at least every 4 years (Figure 7). Soil testing helps farmers determine the level of nutrients in their soil and make decisions about what nutrients need to be applied to achieve an optimal crop. In order to develop a nutrient management plan, farmers must test their soil at least every 3-4 years, according to Tri-State recommendations.

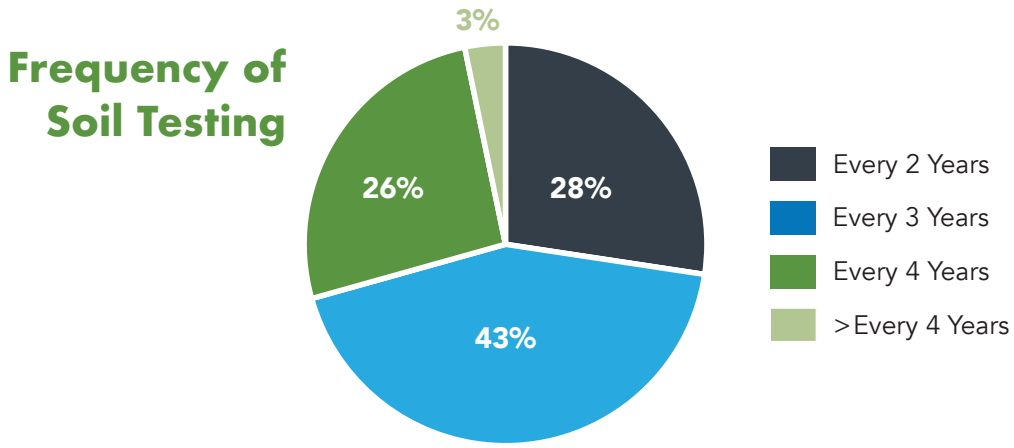


Figure 7. Distribution of soil testing frequency on surveyed fields

Grid and zone sampling are precision agriculture approaches that subdivide fields into defined grids or management zones, allowing soil samples to be collected within each area and providing a more accurate depiction of spatial variability in soil nutrient levels (Figure 8). Currently, 85% of fields use grid or zone soil sampling strategies.

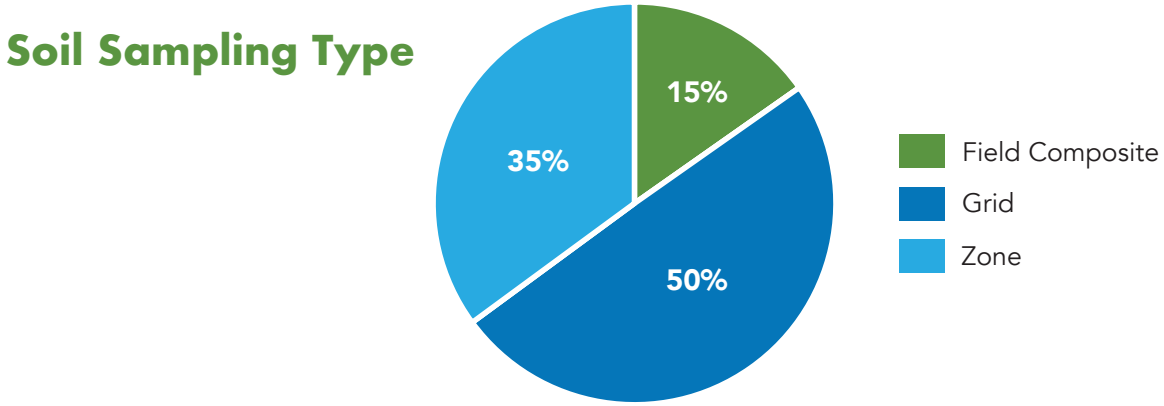


Figure 8. Distribution of soil sampling methods used on surveyed fields

For fertilizer recommendations, farmers utilized fertilizer retailers and crop consultants for 89% of fields surveyed. Farmers used their own knowledge regarding fertilizer on 11% of fields surveyed.

Fertilizer Recommendation Source

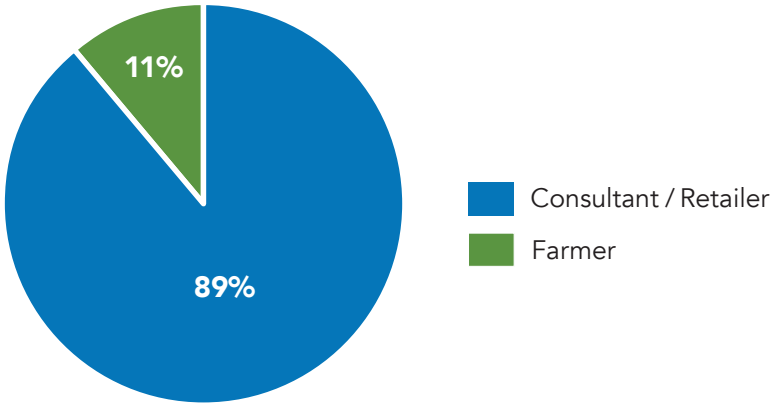


Figure 9. Distribution of fertilizer recommendation sources used for surveyed fields

NUTRIENT APPLICATIONS

Approximately 76% of fields surveyed were covered by an approved voluntary or comprehensive nutrient management plan (VNMP/CNMP), as noted in Figure 10. These plans were approved by their local Soil and Water Conservation District (SWCD) or Natural Resources Conservation Service (NRCS).

Nutrient Management Plan

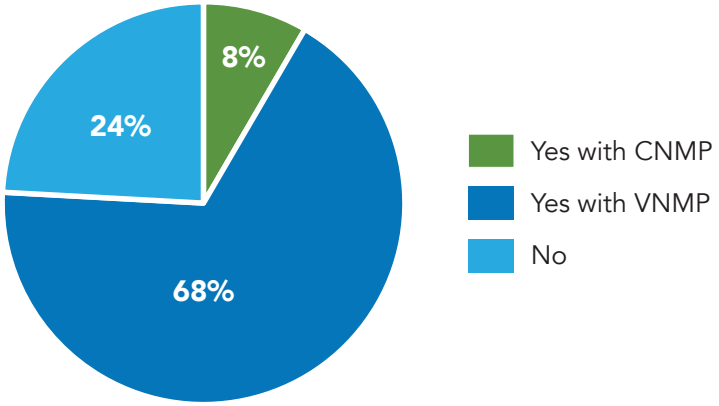


Figure 10. Percentage of surveyed fields that had a voluntary nutrient management plan (VNMP)

Approximately 92% of phosphorus (P) applied is for the 1-2 year crop need (Figure 11). Various methods were used to apply P to the field surveyed, with 52% using surface application with incorporation, 37% placed with planter and 21% using injection, and 5% applied to growing crop or cover crop. (Figure 12). Those that responded with "unsure" are likely a result of CCA's or retailers doing this on behalf of the producers.

Phosphorus Application

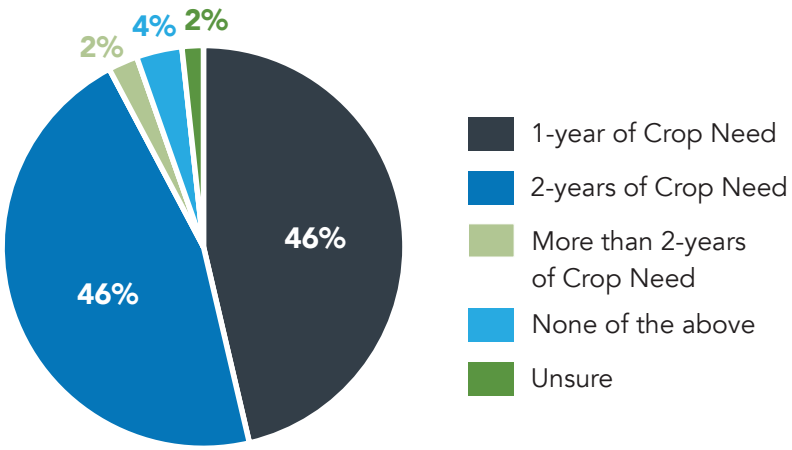


Figure 11. Distribution of amount of phosphorus applied on surveyed fields

For phosphorus management, surface application remains the most identified application method. However, this assessment indicated that most farmers are placing phosphorus at planting, with a substantial proportion also incorporating surface-applied nutrients. Phosphorus injection ranks as the third most common practice, while only a small number of respondents reported applications into a standing cover crop.

Nitrogen application rates for corn fields were determined using a variety of decision-support approaches across surveyed fields. Adaptive management strategies were used on 4% of fields, the Maximum Return to Nitrogen (MRTN) Model (Ohio State University's recommended nitrogen rate tool) was used on 13% of fields, and tissue sampling was used on 6% of fields.

Farmers used N stabilizers on 21% of fields surveyed. N stabilizers or inhibitors help keep nitrogen in forms that are less likely to leave the field. N stabilizers are widely available to farmers for use with N fertilizers; however, they are not readily available for P and potassium (K) inorganic fertilizers.

On the fields surveyed, injection application was the most popular method of nitrogen placement (68%). Methods using a nitrogen starter during planting were also utilized to place the nutrient near the seed (83%), making it accessible to a young root system (Figure 12).

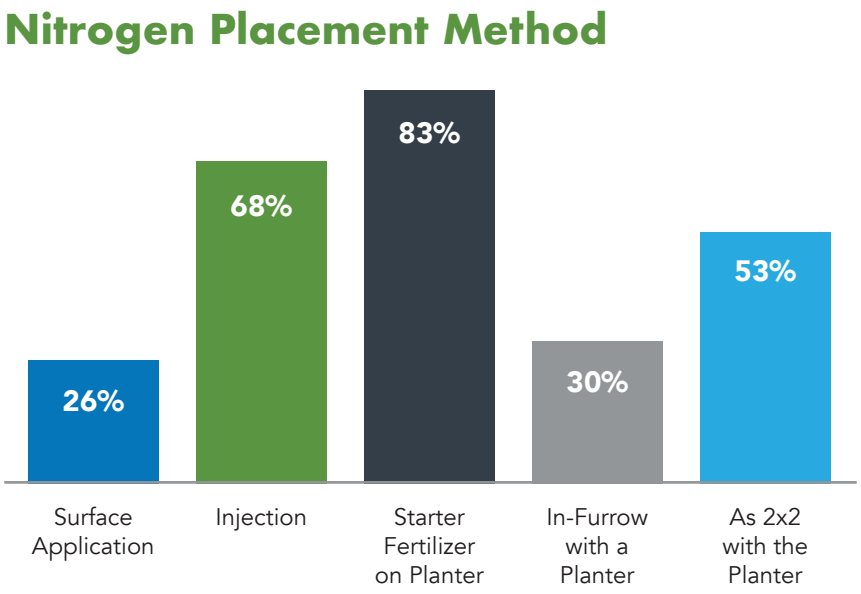


Figure 12. Distribution of nitrogen (N) placement methods on fields

Split nitrogen (N) application was used on 71% of surveyed fields, meaning N was applied in two or more applications during the growing season rather than in a single pass. This approach helps improve nitrogen use efficiency (Figure 13).

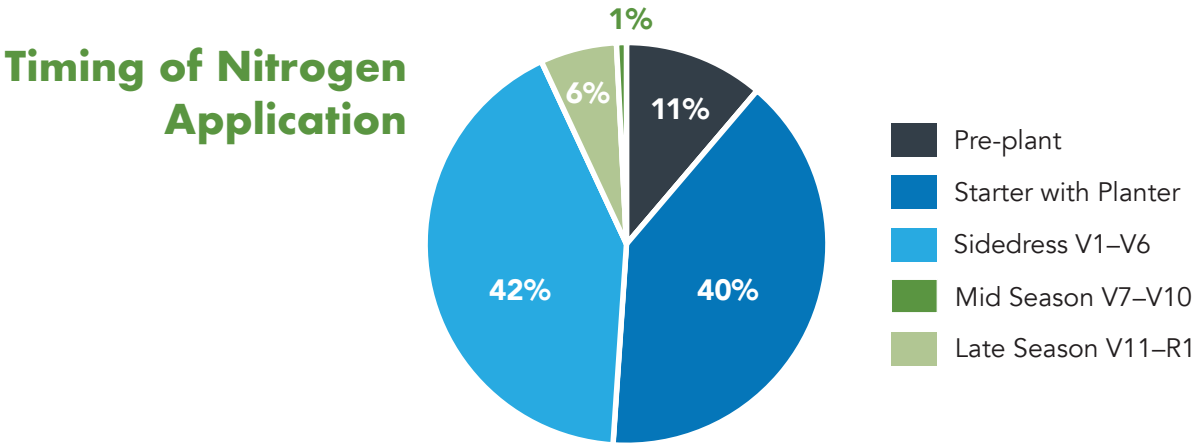


Figure 13. Distribution of N placement timing on surveyed fields

OTHER NUTRIENT MANAGEMENT STRATEGIES

Variable Rate Technology (VRT) Application

- **51%** of fields surveyed had been using variable-rate P application versus **49%** using fixed-rate application
- **23%** of fields surveyed had been using variable-rate N application versus **77%** using fixed-rate application
- **39%** have VRT capabilities that exist on farm versus **61%** that are through a supplier

Manure Application

As seen in Figure 6, **22%** of the fields surveyed received manure, of these:

- **97%** used appropriate setback distances according to USDA-NRCS 590 standards
- **42%** used subsurface application
- **89%** incorporated nutrients into the soil
- **27%** applied into vegetative cover or an actively growing crop, keeping nutrients in the field

WATER MANAGEMENT STRUCTURES

Water management structures and drainage improvement help to minimize soil erosion. Grassed waterways are the most popular method for water management, followed by buffers, controlled drainage and blind inlets (Figure 14). Of the total fields surveyed, 52% did not require or use a water management structure. In the WLEB, 81% of the fields surveyed had no visible sign of soil erosion.

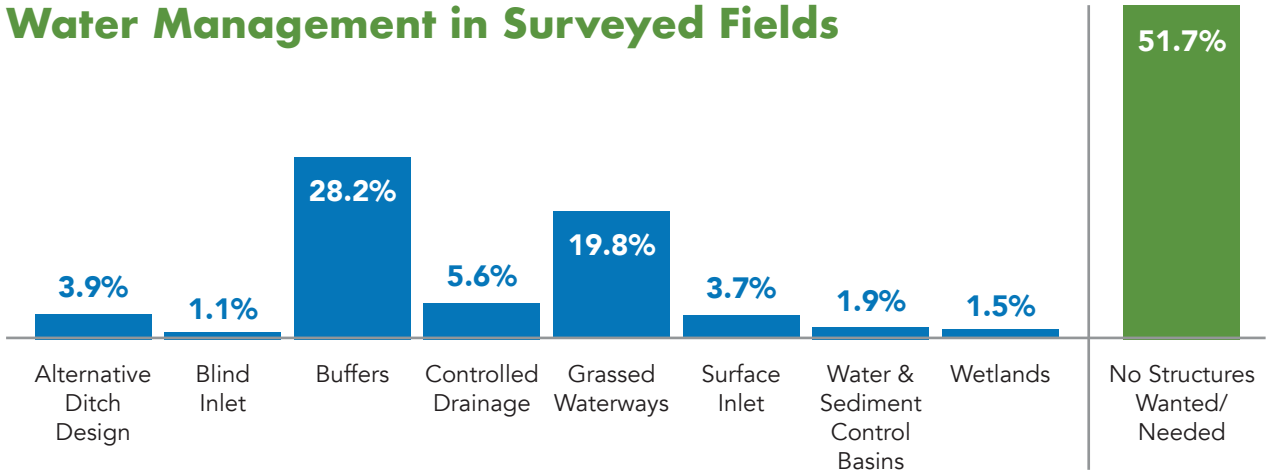


Figure 14. Percent of surveyed fields that had water management structures in-field or at the edge of field.

WATER MANAGEMENT PRACTICES EXAMPLES AND ASSOCIATED COSTS

Figure 15. Buffers — $100 – $200 per acre

Figure 16. Controlled Drainage — $2,000 – $4,000

Figure 17. Grassed Waterways — $4 – $5 per linear foot

Figure 18. Blind Inlets — $3,000 – $4,000

CONCLUSION

This survey presents results from the 2024 crop year in the Western Lake Erie Basin (WLEB). The findings establish a baseline for the adoption of key agricultural practices across the region and provide valuable insight for targeting efforts to increase the use of best management practices. The data demonstrate that certain practices are more widely adopted and have the potential to deliver optimal agronomic and environmental outcomes. Ongoing assessments will expand to additional watersheds across Ohio, with previously evaluated watersheds revisited in future years to measure changes over time. We encourage Ohio's farmers to get involved in the OACI's Farmer Certification program, H2Ohio and any other conservation focused program to learn about new practices, share information and become better stewards of the land.