



Over 30 Years of Conservation Innovation



2024 REPORT – H2OHIO RESEARCH PROJECT

What's the economic advantage of applying phosphorus?

Replicated plots

There were three replicated plots established in 2024, one in corn and two in soybeans. The corn plot had fall of 2023 strip-till phosphorus fertilizer applied in the control treatments. The soybean plots had no fertilizer applied in 2024, so treatments followed the previous year phosphorus application locations. Experimental areas received no phosphorus fertilizer.

Economics: A partial budget analysis of all three replicated plots showed a loss of income by applying phosphorus fertilizer. Sandusky county plot = \$41.12 loss, Henry County plot = \$21.50 loss, and Fulton County plot = \$14.25 loss. The Fulton County plot had a significant gain in yield of 0.95 bushels/acre for the phosphorus control treatment. The other 2 replicated plots had no significant difference in yield without phosphorus fertilizer.

Trend analysis: After one year of soil test comparison the following phosphorus M3 values were:

Henry County replicated plot experimental area average = 18.3 ppm P which is a loss of 2.7 ppm P compared to the control area with P fertilizer.

Fulton County replicated plot experimental area average = 33.8 ppm P which is identical to the control area with P fertilizer.

Sandusky County replicated plot experimental area average = 65.7 ppm P which is a gain of 13.4 ppm P compared to the control area with P fertilizer.

Side by Side Comparison Plots

These plots were delayed start due to difficulty in finding proper sites. Only baseline data was collected due to no phosphorus fertilizer applications in 2024. Comparisons will begin in 2025.

Of the 6 plots, 2 were in wheat, 2 were soybeans planted into a cereal rye cover crop, and 2 were soybeans with no cover crop. There are 2 low P sites with values of 13 and 20 ppm P, 2 mid-range sites with values of 27 and 28 ppm P, and 2 high sites with values of 32 and 34 ppm P in the experimental areas.

Soil health testing was conducted. Soil health scores combine several measures of the Haney test into one number score with a higher number as best. Soil health scores in the experimental areas were: 7, 8, 21, 22, 23 and 24. The 2 lower soil health scores were from areas with lower CEC and no cover crop.

Education and Outreach

Publications: Ohio State University Extension On-Farm research reports were published at <https://agcrops.osu.edu/on-farm-research/2023> There are three reports title: Effect of Starter Phosphorus Fertilizer on Corn Yield. Also, the CAP website at <https://www.capofohio.org/local-research.html> lists these publications. These reports were shared at meetings and field days.

Reports were submitted to the OSU 2024 eFields publication.

Outreach activities: Alan Sundermeier participated in a number of events at which he discussed H2Ohio and this phosphorus research.

10-12-23 - The Nature Conservancy, Lunch & Learn webinar

2-5-24 - Ohio Country Journal podcast

2-14-24 – CAP meeting, Archbold, OH, Advocates for Soil Health : Local Farmers, Local Results

3-13-24 – Conservation Tillage Conference, Ada, OH,, Is Phosphorus Starter Fertilizer Needed for Corn?

8-21-24 – Wood SWCD meeting, Bowling Green, OH, Farmer Phosphorus Plots

8-29-24 – CAP field day, Napoleon, OH., Nutrient Management Field Day

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