Evaluation of Phosphorus Fertilizer, Lucas County

PhycoTerra & Phosphorus Starter Fertilizer Research

Objective: Determine the agronomic response to crop production and soil health of no phosphorus starter fertilizer versus with phosphorus and no PhycoTerra versus with PhycoTerra overlaid on the phosphorus study.

Background: This study supports the H2Ohio goal of reducing phosphorus fertilizer application. The plot is located in Lucas County, Ohio on a uniform Mermill loam soil. Field length treatment strips are maintained throughout the multi-year study. PhycoTerra® products are developed and produced by Heliae® Agriculture, specializes in microalgal technology, soil, and crop science.

Treatments	2024 corn yield bu/ac	2025 soybean yield bu/ac
No Phosphorus starter	224.2	55.1
With Phosphorus starter	230.0	58.2
Phyco Terra & No Phosphorus	231.8	58.0
Phyco Terra with Phosphorus	240.4	61.2

Treatments	Soil Test P ppm – M3 2024	Soil Test P ppm– M3 2025
No Phosphorus starter	30	16
With Phosphorus starter	37	22
Phyco Terra & No Phosphorus	25	22
Phyco Terra with Phosphorus	35	23

Treatments	Soil Health Score 2024	Soil Health Score 2025
No Phosphorus starter	10.7	8.7
With Phosphorus starter	13.1	10.5
Phyco Terra & No Phosphorus	11.5	9.6
Phyco Terra with Phosphorus	14.0	8.8

Economic Summary

Table 1. Impact of Phosphorus (P) Fertilizer and PhycoTerra 2024

Starter Phos. gal/ac	Phyco Terra qt/ac	Corn Yield bu/ac	Value of Grain $/ac	Cost of Phos. $/ac	Cost $/ac Phyco Terra	Net $/ac	Return $/ac
0	0	224.2	$896.80	0	0	$896.80	base
10	0	230.0	$920.00	$ 23.25	0	$896.75	- $ 0.05
0	1	231.8	$927.20	0	$26.00	$901.20	+ $ 4.40
10	1	240.4	$961.60	$23.25	$26.00	$912.35	+ $ 15.55

Based on $4.00/bu corn. Phyco Terra at $26.00 /quart
Phosphorus- $800/ton 10-34-0 ($4.65/gal. x 10 gal/ac = $46.50 / 2 = $23.25/ac expensed over 2 years)

Table 2. Impact of Phosphorus (P) Fertilizer and PhycoTerra 2025

Starter Phos. gal/ac	Phyco Terra qt/ac	Bean Yield bu/ac	Value of Grain $/ac	Cost of Phos. $/ac	Cost $/ac Phyco Terra	Net $/ac	Return $/ac
0	0	55.1	$551.00	0	0	$551.00	base
10 (2024)	0	58.2	$582.00	$23.25	0	$558.75	+ $ 7.75
0	1	58.0	$580.00	0	$26.00	$554.00	+ $ 3.00
10 (2024)	1	61.2	$612.00	$23.25	$26.00	$562.75	+ $11.75

Based on $10.00/bu soybean Phyco Terra at $26.00 /quart
Phosphorus- $800/ton 10-34-0 ($4.65/gal. x 10 gal/ac = $46.50 / 2 = $23.25/ac expensed over 2 years)

Comments

The amount of return showed the effect of adding inputs of starter phosphorus or Phyco Terra versus no inputs. Similar results were shown in both years of corn and soybeans. Adding starter phosphorus input as a single input resulted in a slight negative return on corn but a positive return in all other cases. Phyco Terra was a slight positive return as a single input.

Both soil test P and soil health scores improved with added inputs.

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