Technical Details & Agronomy Overview

RHIZOSORB®

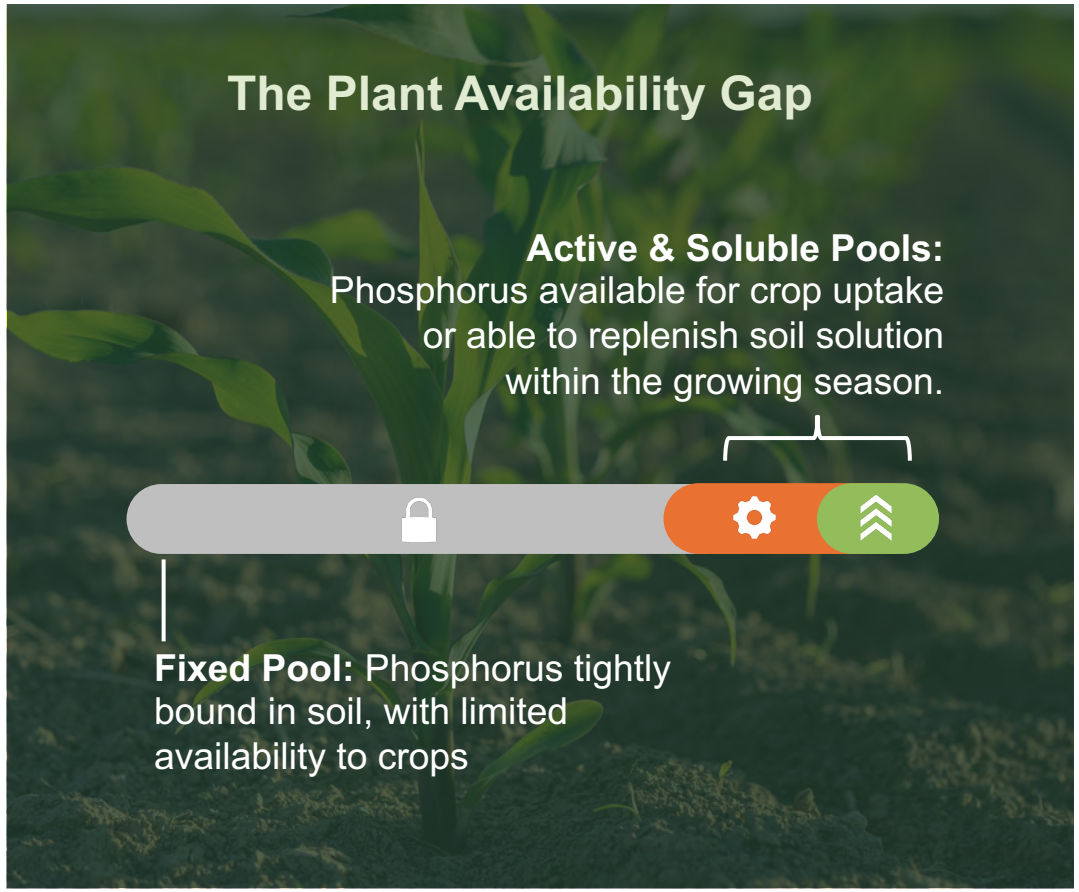


Updated September 2026

Not for Distribution

PHOSPHOLUTIONS

The Challenge with Conventional Phosphates



Conventional phosphate availability is constrained by soil chemistry:

- MAP/DAP dissolve quickly, but much of the phosphorus binds to soil particles
- Phosphorus cycles between soluble, active, and more tightly bound pools
- Conventional fertility programs compensate by increasing application rates to provide for crop needs and build/maintain soil P reserves.

Not for Distribution

Why Change Phosphate Management

The Cost of Build/Maintain

- Developed to offset inefficient P use by building soil reserves for future crops
- Relied on stored P releasing when crops need it, an assumption less reliable today

The Risk of Cutting Traditional P

- Multiple years of high prices and volatility have led some growers to cut back applications
- Can draw down soil P reserves and put future yields at risk

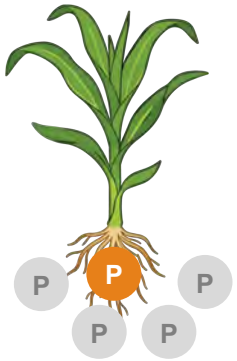
Growers need a more efficient and cost-effective way to meet the crop's P requirements.

Not for Distribution

A New Approach: Feed the Plant, Not the Soil

CONVENTIONAL PHOSPHATE

Manage around phosphate inefficiency



- High rates to overcome tie-up and ensure crop availability
- Build soil-test P hoping it cycles to the crop

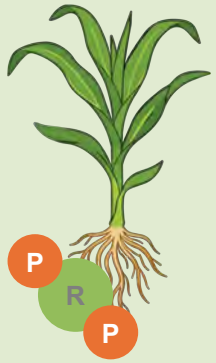
THE TRADEOFF

More P applied than the crop needs

- Higher fertilizer cost
- Luxury consumption and environmental loss

RhizoSorb

Manage for crop needs



- P available to feed the crop
- No need to build soil P levels above critical value

THE RESULT

Meet crop demand with less applied P

- Lower fertilizer cost
- Maintained yields and soil-test P

Not for Distribution

PHOSPHOLUTIONS

How RhizoSorb Works

RhizoSorb is a mineral-based active ingredient that controls phosphorus release from the granule to keep more P available for the crop.

1. **Phosphorus is bound to RhizoSorb during manufacturing** creating an enhanced phosphate fertilizer

2. **RhizoSorb holds phosphorus in a plant accessible form,** reducing soil tie up

3. **Changes in the soil-water solution trigger release** of phosphorus for crop uptake



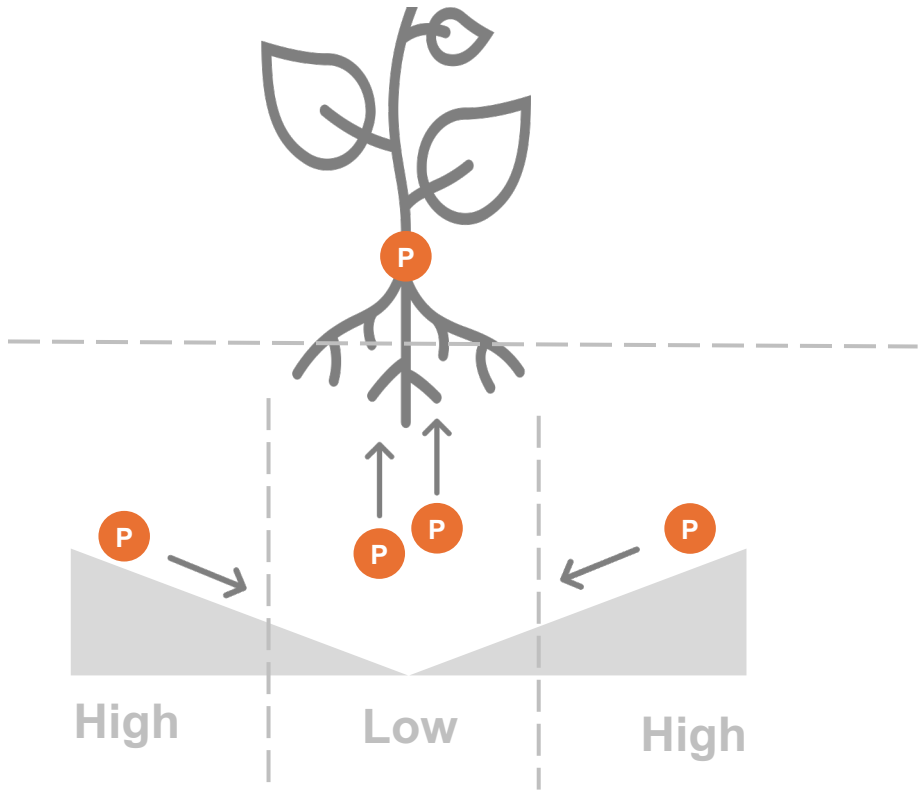
THE RESULT

More plant-available phosphorus with less applied P_2O_5

Not for Distribution

PHOSPHOLUTIONS

Understanding RhizoSorb's Phosphorus Release



Phosphorus Availability

Plants take up P as orthophosphate from the soil solution, so continued availability depends on replenishing that solution as the crop removes P.

Most Phosphorus Moves by Diffusion

Phosphorus moves from high to low concentration in the soil as roots uptake P and release enzymes and organic acids to balance the gradient.

RhizoSorb Release

Those changes in the soil solution trigger P desorption from RhizoSorb, replenishing plant-available phosphorus for crop uptake.

Not for Distribution

PHOSPHOLUTIONS

Designed as a Drop-In Replacement

Similar handling with lower salt index for greater placement flexibility

		RhizoSorb 8-39-0	MAP	DAP
Comparable Granule Size	Size Guide Number (SGN)	260-340	250-350	250-350
	Uniformity Index	40-60	40-60	40-60
Comparable Physical Handling	Crush Strength (lbF)	7.90	8.10	8.67
	Angle of Repose	31°	31°	36°
	Bulk Density (lb/ft^3)	65.1	63.0	67.0
Lower Salt Index	Salt Index	16.3	26.7	29.2

Not for Distribution

Validated at Scale

700+
trials

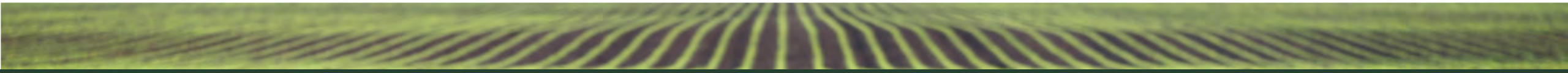
6
crops

22
US states + Canada

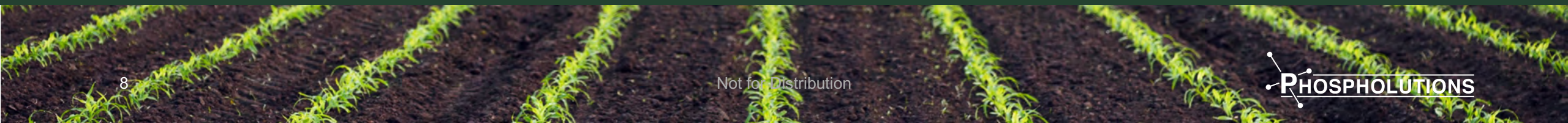
5
years on-farm

1M+
acres

updated through the 2026 crop year



Across trials, RhizoSorb consistently maintains or increases yield with up to 50% less applied phosphorus than grower standard practice.



Not for Distribution

PHOSPHOLUTIONS

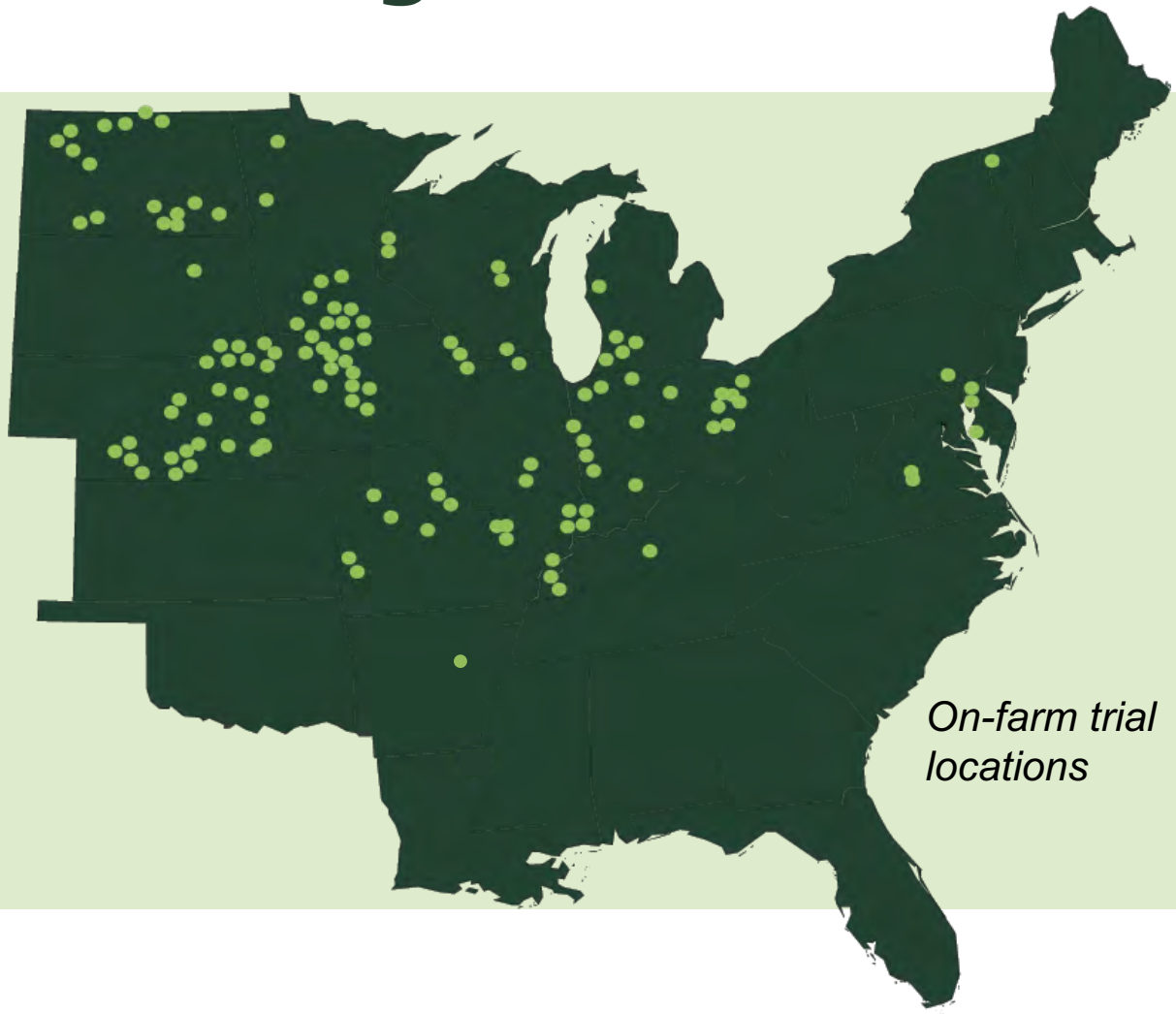
Rigorous Trial Program

Small Plot & University Trials

- **12+** research stations at **25+** locations, including Penn State, NDSU, Ohio State, Auburn, NMSU
- **161** cumulative trial site years of testing
- **5** years of Plot-on-Plot research

On-farm Validation

- **195** on-farm trials over **5** years
- Side-by-side comparisons against grower's standard practice, with at least 20 acres per treatment
- Evaluated in corn, soy, wheat, canola, potatoes, and cotton



On-farm trial locations

Not for Distribution

PHOSPHOLUTIONS

How We Report Trial Data

We aim to present comprehensive, consistently evaluated trial data that reflects RhizoSorb performance under real-world field conditions.

RELATIVE YIELD

Yield is reported relative to the grower's standard practice (GSP), set at 100%, which allows us to compare performance across sites with different yield potentials.

ON-FARM vs SMALL PLOT

On-farm trial data is prioritized whenever possible.

Any analyses that combine on-farm and small-plot results are clearly labeled.

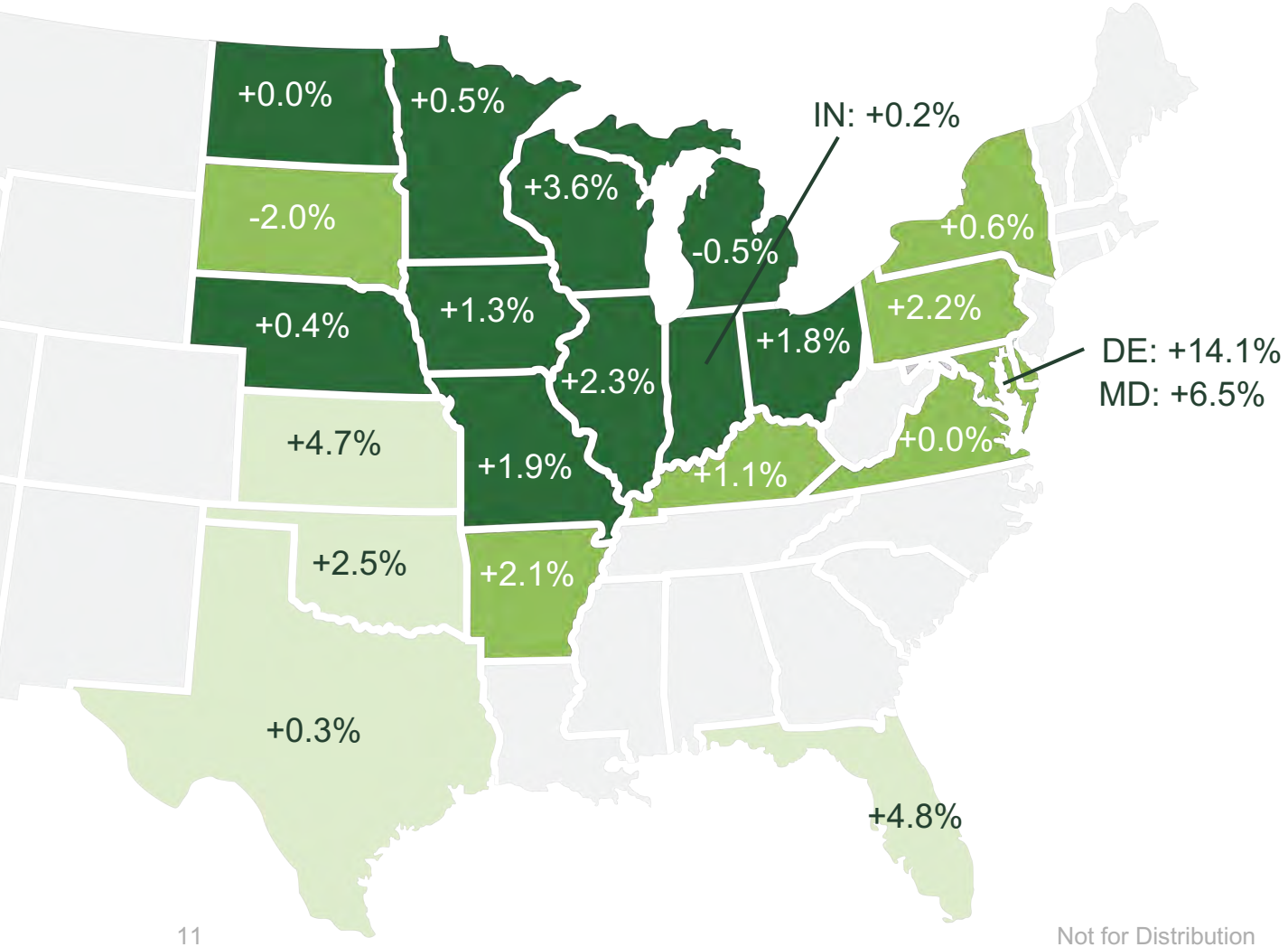
CONDITIONS EVALUATED

All trials compare relative yield, while select trials also evaluated performance across:

- **Soil Texture**
- **pH**
- **Soil Test P**

Not for Distribution

Performance Across Geographies



Across growing environments, RhizoSorb delivers similar or better yields with less applied P compared to grower standard practice.

Relative yield advantage over grower standard practice across all trialed crops. State level data should be interpreted in context of dataset size.

- Robust On-Farm Data
- Limited (<5) On-Farm Data
- Small Plot Research Only

Not for Distribution

PHOSPHOLUTIONS

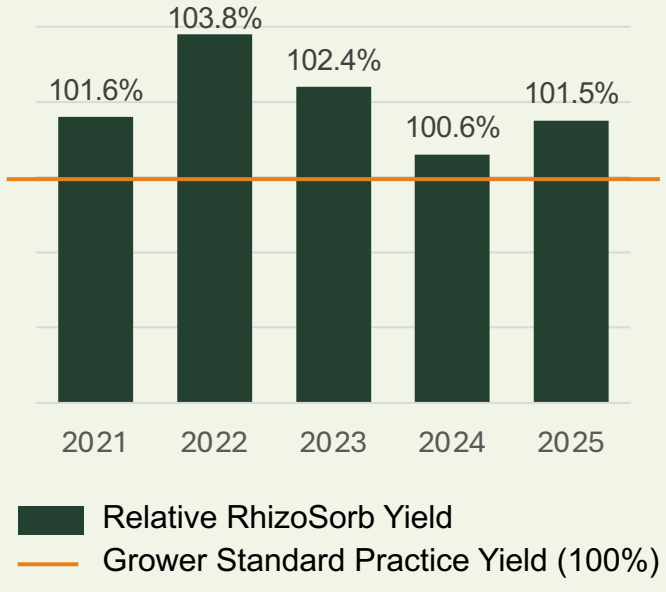
Same or Greater Yields Across Major Row Crops

50% P_2O_5 with RhizoSorb vs 100% P_2O_5 with Conventional Phosphate

Corn

+2% avg yield advantage

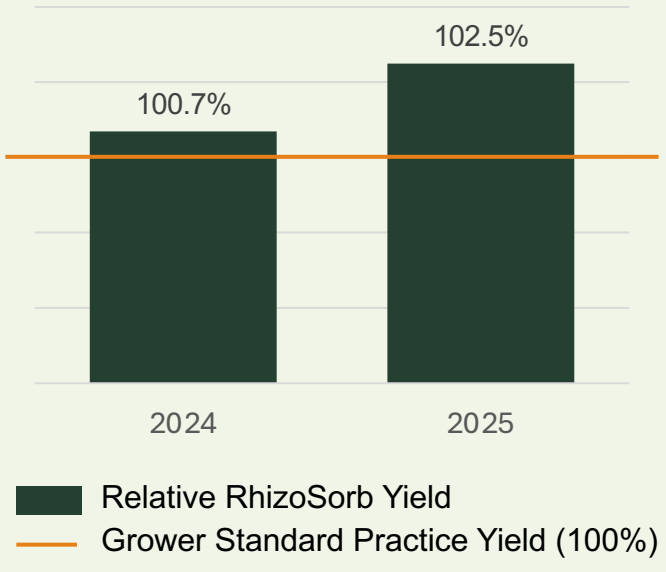
148 On-Farm Trials



Soybeans

+1.6% avg yield advantage

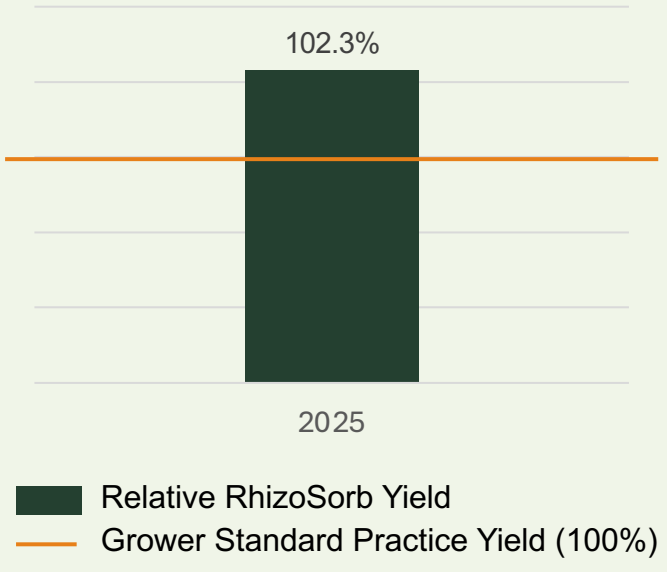
23 On-Farm Trials



Wheat

+2.3% avg yield advantage

Small-Plot Trials in 5 States



Not for Distribution

PHOSPHOLUTIONS

Consistent Performance Across Soil Textures

Tested in 184 soil environments on-farm, with
RhizoSorb at 50% P_2O_5 vs. Conventional Phosphate at 100% P_2O_5

Soil Texture

MORE CLAY SOILS	LOAMY SOILS	MORE SANDY SOILS
Silty Clay Loam: 101.5% *relative yield, N=41* **Clay Loam: 101.9%** *relative yield, N=53*	**Silt Loam: 102.%** *relative yield, N=47* **Loam: 100.5%** *relative yield, N=54*	**Sandy Loam: 99.6%** *relative yield, N=13* **Loamy Sand & Sand: 107.5%** *relative yield, N=6*
Maintains availability in soils with greater P-fixation potential	*Efficient P availability under balanced soil conditions*	*Keeps P available in soils with lower holding capacity*

Not for Distribution

Greater P Efficiency Across the pH Spectrum

Evaluated in both on-farm trials and contracted research sites, with RhizoSorb at 50% P_2O_5 vs. conventional phosphate at 100% P_2O_5

	Number of Data Points	Relative Yield
Acidic Soils pH <6	604	101.0%
Near-Neutral Soils pH 6-7	1134	100.4%
Alkaline Soils pH >7	404	100.2%

RhizoSorb doesn't require ideal soil pH to deliver its efficiency advantage:

Across the pH spectrum, reduced-rate RhizoSorb outperforms traditional phosphates at full rate.

Not for Distribution

Strong Performance – Even in Low P Soils

	Number of Data Points	Relative Yield
Low P <20 ppm	11	101.1%
Medium 20 - 40 ppm	40	101.4%
High P >40 ppm	24	100.5%

RhizoSorb maintained yield in on-farm and small plot trials, comparing RhizoSorb at 50% P_2O_5 vs conventional phosphates at 100% P_2O_5

GROWER CASE STUDY

Andy DeVries, IA Farmer
New farm with depleted P



The Strategy: Used RhizoSorb to provide efficient in-season P rather than relying on a large upfront investment to build soil-test levels.

The Result: After seeing a yield improvement and cost savings in his on-farm trial, DeVries transitioned his farm to RhizoSorb.

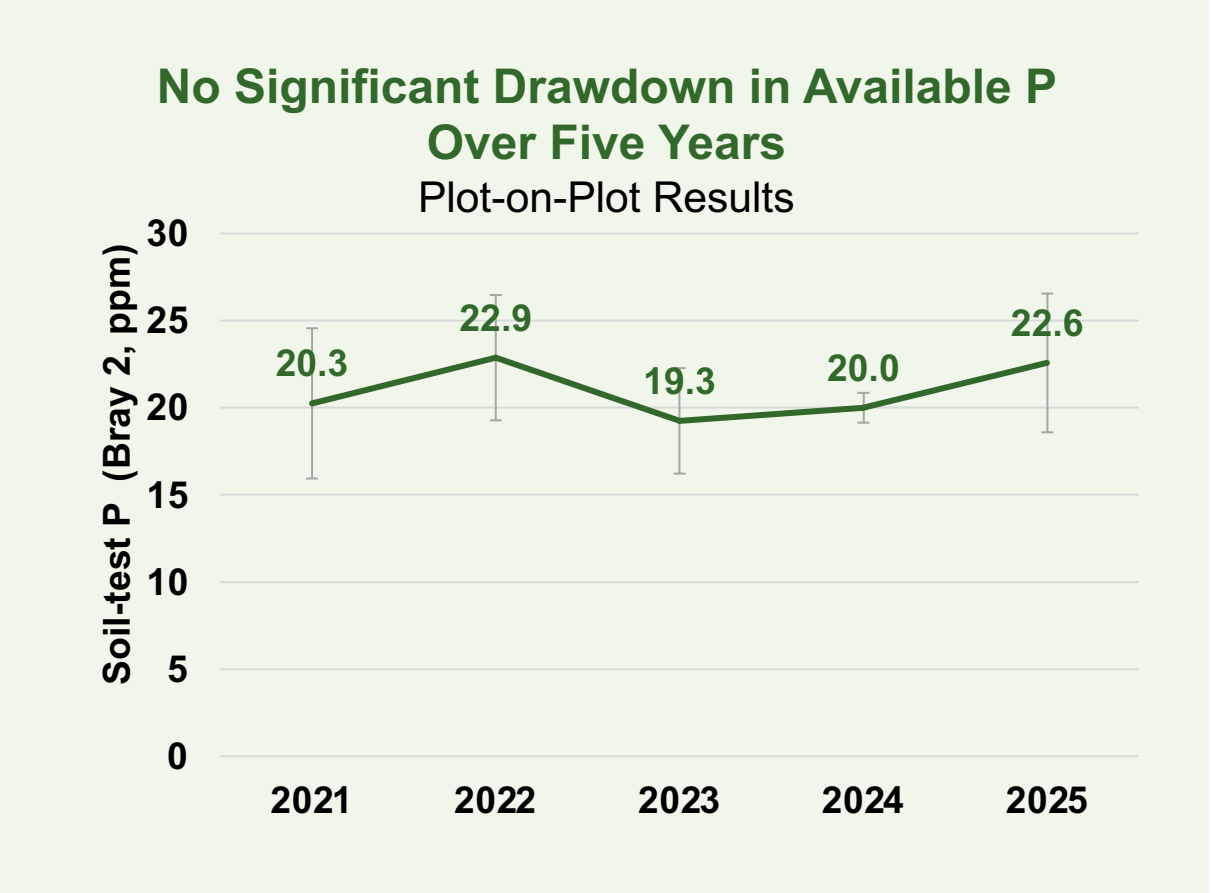
Not for Distribution

50% Less Phosphorus
Without Drawing Down Soil-Test P

Multi-year, plot-on-plot trials at P-responsive sites evaluated whether 50% lower P_2O_5 rates with RhizoSorb would draw down soil-test P over time.

- 32 site-years across 8 locations
- 6 reps/treatment
- STP <25 ppm
- Soil test prior to P application each year

Results: RhizoSorb maintains soil-test P and crop yields with 50% less P_2O_5 over time.



Not for Distribution

Fits Existing Phosphate Application Practices

As a direct replacement for MAP, DAP, TSP, or NPS, RhizoSorb fits into a grower's preferred timing and application method for granular phosphates.

Timing

Spring	Fall
180 trials	11 trials
101.0% relative yield	101.1% relative yield

Method

Broadcast	Strip-Till	Air Seeder*	Banded
82 trials	27 trials	2 trials*	11 trials
101.5% relative yield	100.2 relative yield	110.9%* relative yield	100.6% relative yield

**Results should be interpreted in context of dataset size*

Not for Distribution

Building a RhizoSorb Fertility Program

1

Determine Reduced Rate. 50% of the conventional P_2O_5 rate, resulting in lower product volume per acre:

- 33% less vs. MAP
- 41% less vs. DAP & TSP
- 49% less vs. MAP + sulfur products

2

Balance and Blend. Account for the N, S, Zn or other macro- and micronutrients.

- Compatible in standard dry fertilizer blends



Tip: Rate calculators and technical agronomy support available for application recommendations.

Not for Distribution

Application Considerations

Reduced application rates may fall below the minimum settings of some broadcast application equipment in zones with higher soil-test P.

Recommendations

- Adjust variable-rate prescriptions to account for equipment minimums.
- Work with Phospholutions' technical agronomy team to determine appropriate rates.

Example:

Old Splits			New Splits		
Bray Levels	**MAP Rate**		Bray Levels	**RhizoSorb Rate**	% reduction
1 to 6	153		1 to 6	101	33%
7 to 9	144		7 to 9	95	33%
10 to 11	125		10 to 11	83	33%
12 to 14	115		12 to 14	76	33%
15 to 17	**96**		**15 to 18**	**63**	**33%**
18 to 20	**67**		**19 to 20**	**50**	**25%**
20 & above	0		20 & above	0	--

Not for Distribution

Where to Use RhizoSorb

Wherever you're currently using conventional phosphates, you can use RhizoSorb:

- No specific soil types or growing conditions have been identified that limit relative performance.
- Directly replace MAP/DAP/TSP/NPS at the recommended reduced rate.
- No need to blend with conventional phosphate or change application practices.



2026 canola trial: RhizoSorb, left, and Grower Standard Practice, right

Not for Distribution