

AGNYTE

Cutting Input Costs by Pairing Biology with Synthetic Fertilizer

A grower's guide to reducing synthetic nitrogen without sacrificing yield

The Bottom Line

Fertilizer is the single largest line item on most row-crop budgets, and nitrogen prices remain well above pre-2021 levels. Agnyte, a microbial product from Agnetic Bio, is designed to be layered on top of an existing synthetic fertilizer program—not to replace it. By supplying biologically-fixed nitrogen and improving how efficiently the crop uses what is applied, growers using Agnyte have consistently cut synthetic nitrogen by around 30 kg/ha without giving up yield.

That reduction translates directly into dollars saved at the retail counter, while preserving the yield insurance that synthetic N provides. The result is lower input costs, lower greenhouse-gas exposure tied to nitrogen manufacturing, and more flexibility when input markets get volatile.

~30 kg N/ha Typical synthetic N reduction with Agnyte	33–44% Share of corn operating costs from fertilizer	Up to 50% Of applied fertilizer typically unused by the crop
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The Input Cost Problem

U.S. nitrogen fertilizer prices climbed more than 200% between 2020 and 2022. Although prices have moderated, they remain elevated, with urea recently ranging between roughly \$876 and \$1,259 per ton at the distributor level. Tariff actions through 2025, natural-gas price increases heading into 2026, and ongoing geopolitical disruption to global supply continue to put upward pressure on costs.

At the same time, agronomic research has shown that as much as half of the nitrogen applied to corn-soybean systems is never taken up by the crop—it leaches, volatilizes, or locks up in the soil. Every pound of unused nitrogen is a pound paid for that produces no yield. Combined with fertilizer making up 33–44% of corn operating costs and 34–45% of wheat operating costs, this is the line item with the most room to optimize.

How Agynte Works

Agynte is a foliar-applied microbial product containing a consortium of bacteria with three reinforcing modes of action:

Mode of Action	What it Does for the Crop
Nitrogen Fixation	Converts atmospheric nitrogen into plant-available ammonium, supplementing what comes from urea or UAN.
Nutrient Use Efficiency (NUE)	Improves uptake of applied nitrogen, phosphorus, and other nutrients—reducing leaching and lock-up in the soil.
Phytohormone Production	Bacteria produce cytokinins, auxins, gibberellic acid, and siderophores that drive root development and stronger plant growth.

Because Agynte is applied to the leaf rather than the soil, it sidesteps the variability—temperature, pH, moisture, microbial competition—that limits soil-applied biologicals. The formulation includes UV protection to maintain organism survival after spraying, helping deliver consistent performance across diverse growing conditions. Agynte is registered across 26 EU countries and has been used commercially across the EU, United States, Canada, and Brazil.

The Combination Strategy: Agynte + Synthetic Fertilizer

Agynte is not a replacement product. The right way to think about it is as a multiplier on the synthetic program a grower is already running. The combination works on two fronts at once:

- 1. **Supplementary nitrogen supply.** The bacteria fix atmospheric N₂ and deliver it gradually to the plant over the season—biological nitrogen the grower did not have to buy.
- 2. **Better return on every pound of synthetic N applied.** By improving nutrient use efficiency, the crop captures more of the synthetic N that does go down. Less is lost to leaching, volatilization, and soil lock-up.

Practically, this lets growers reduce their synthetic N rate—typically the topdress or in-season application—rather than cutting the base program. Most international growers using Agynte have trimmed synthetic N by approximately 30 kg N/ha (roughly 27 lb N/acre) with yields holding steady, which has been validated across canola, maize, sunflower, bell pepper, cucumber, and lettuce trials.

Sample Savings Analysis

The example below uses a corn-style program with a 150 kg N/ha baseline and current distributor-level urea pricing. Numbers are illustrative; actual savings depend on local urea prices, crop type, and the rate adjustment a grower makes.

Metric	Conventional Program	With Agynte Combined
Synthetic N applied	~150 kg N/ha	~120 kg N/ha
Equivalent urea (46-0-0)	~326 kg urea/ha	~261 kg urea/ha
Urea cost at ~\$1,070/ton	~\$349/ha	~\$279/ha
Per-acre fertilizer cost	~\$141/acre	~\$113/acre
Gross fertilizer savings	—	~\$70/ha ~\$28/acre

Rule of thumb: for every 30 kg N/ha trimmed from the synthetic program, the gross fertilizer savings sit in the **\$60–\$90/ha (\$24–\$36/acre)** range at recent urea prices—before factoring in any yield or quality upside from improved root development.

On a 1,000-acre operation, that scales to roughly \$24,000–\$36,000 of recovered margin per season from the fertilizer line alone, against the cost of an Agynte application program.

Benefits Beyond the Fertilizer Line

- **Stronger root systems.** Improved yield and quality traits. Increased phytohormone production drives a larger root system, which compounds the nutrient-uptake benefit and supports stronger plant growth.
- **Lower carbon footprint.** Reducing the synthetic N rate cuts the greenhouse-gas emissions embedded in nitrogen fertilizer manufacturing—a meaningful piece of any farm-level sustainability or scope-3 reporting.
- **Reduced environmental risk.** Less unused fertilizer in the soil means less nitrate leaching into groundwater and surface water, supporting compliance with nutrient-management plans and conservation program requirements.
- **Supply resilience.** With urea and UAN prices subject to tariff swings, energy-cost spikes, and shipping-route disruption, a portion of the nitrogen budget shifted to a biological source reduces exposure to those markets.

Putting It Into Practice

Agnyte plugs into an existing program rather than overhauling it. A typical decision framework looks like this:

- **Start with the agronomy.** Confirm baseline N rate, soil tests, and tissue tests as you would in any year.
- **Plan the rate reduction.** Trim synthetic N by roughly 30 kg N/ha—usually from the topdress or in-season pass, not the base.
- **Apply Agnyte foliar.** Apply Agnyte at the labeled crop stage (for example, the four-to-six leaf stage in canola).
- **Monitor and confirm.** Use seasonal scouting, tissue tests, and yield mapping to validate before scaling across the operation.

The combination of biology and synthetic fertilizer is not a moonshot. It is a measured way to take dollars out of the most expensive input on the farm, while keeping the yield safety net intact.

Sources

- Agnetic Bio – Agnyte N₂ product page (agnetibio.com)
- Agnetic Bio coverage – Farm Weekly / North Queensland Register, April 2026 (~30 kg N/ha reduction figure)
- USDA Economic Research Service – fertilizer share of operating costs and price trends
- USDA Agricultural Marketing Service – Farm Production Cost Report (recent urea distributor pricing)
- Union of Concerned Scientists – fertilizer cost and unused-nitrogen analysis (2026)
- Farm Progress – Input cost outlook for 2026

Prepared for grower education. Cost figures are illustrative and depend on local pricing and program decisions.