BiOWiSH® Enhanced Efficiency Fertilizer as a Climate-Smart Tool

Experience the Benefits of a New Class of Enhanced Efficiency Fertilizer

BiOWiSH® is an advanced biological additive that can be coated onto granular fertilizer or mixed with liquid fertilizer. Available across the globe through our network of fertilizer distributors, the BiOWiSH® Fertilizer Enhancement has an industry leading shelf-life and stability, helping farmers achieve consistent results across a broad range of environments, operating conditions, and management practices. Growers are able to optimize yield potential by improved nutrient uptake, while increasing the potential for improved emission scoring.

Sustainability Potential

- Improves soil conditions for better yield per acre while improving the efficiency of mineral fertilizers
- Contains naturally occurring, naturally evolved organisms that are not genetically modified by humans
- Utilizes technologies that can reduce synthetic fertilizer without sacrificing yield, which may lead to improved emission scoring
- Has the potential to enhance the efficiency of synthetic fertilizer and optimize yield potential per unit of land, which could result in lower per bushel carbon emissions

Demonstrated Results

- Increases nutrient use efficiency and supports nutrient uptake
- Backed by more than 220 independent, third-party trials evaluating BiOWiSH® treatments against a standard fertility program
- Optimizes yield potential by improved nutrient uptake of applied fertilizer

Application Methods

- No management changes or costs are required by the grower, beyond the cost of the product
- Coated directly onto granular fertilizer or mixed with liquid fertilizer, and arrives on-farm, ready to apply
- Can be added to the grower's current fertility program: pre-plant, topdress, sidedress, in-furrow, etc.

Benefits

- Optimizes yield potential by improved nutrient uptake
- Increases nutrient use efficiency and supports nutrient uptake
- Optimizes soil conditions for greater root mass
- Improves soil conditions for increased plant vigor
- Enhances beneficial microbes in the rhizosphere

Find a BiOWiSH® distributor near you at biowishtech.com/biowish-distributors.

Independent Third Party Research Shows Value for Farmers

By using fertilizers powered by BiOWiSH® Crop Liquid, farmers can benefit even more from their trusted fertility programs with higher returns on investment. Here are the results from our collaborative research efforts around the world, which identified farmer economics when comparing BiOWiSH® to the most common management practice:

Crop	Third Party Test Partner	Fertility Level (%)	Yield Change (%)	Net Income Gain (%)	Profit Change ($USD/ha)
Grain Corn	Brazil Independent Research	100	11.4	12	$39
Grain Corn	USA Independent Research	100	5.0	5	$59
Grain Corn	Indonesia Government Entity	100	7.3	23	$634
Rice	USA Independent Research	85	12.8	16	$214
Rice	Vietnam Independent Research	90	9.4	18	$102
Wheat	USA Independent Research	100	7.2	8	$68
Wheat	Australia Independent Research	100	6.6	6	$42
Sorghum	USA Independent Research	100	8.1	8	$61
Sorghum	Sudan Independent Research	100	15.9	24	$126
Tomato	USA Independent Research	100	16.2	17	$329
Cucumber	China Independent Research	100	19.7	21	$957
Onion	Sudan Independent Research	90	15.5	18	$335
Sugarcane	Brazil Independent Research	100	23.6	24	$365
Potato	USA Independent Research	100	13.2	13	$812
Walnut	USA Independent Research	100	7.9	8	$2668
Bok Choy	Vietnam Government Entity	100	13.8	14	$680

** Net income is the crop value minus the fertility program cost and does not account for non-fertility expenses.*
*** Profit change is the difference between net income of the respective program and the Control.*

Performance Summary: BiOWiSH® in Standard and N Optimized Fertility Programs

BiOWiSH® endophytic *Bacillus* deliver soil nutrients to crops through the rhizophagy cycle creating a symbiotic relationship between the plant and soil microbes. This enables optimized yield potential by improved nutrient uptake, which in a meta analysis led to yield uplifts of 7.7% over the Control in standard fertility programs. Furthermore, a 4.5% average yield uplift was observed in the N Optimized Fertility Programs despite a 10% reduction in fertilizer use.

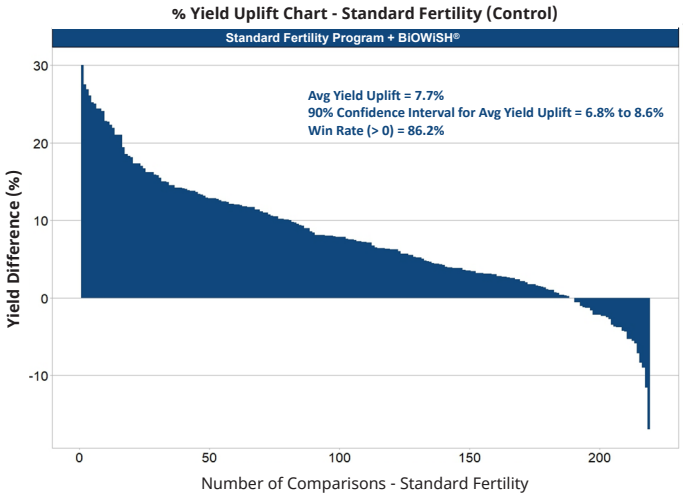

Figure 1: Standard fertilizer rates with the addition of a BiOWiSH® treatment win over the Control 86.2% of the time on average. The average yield uplift of 7.7% over the Control is statistically significant in this meta analysis.

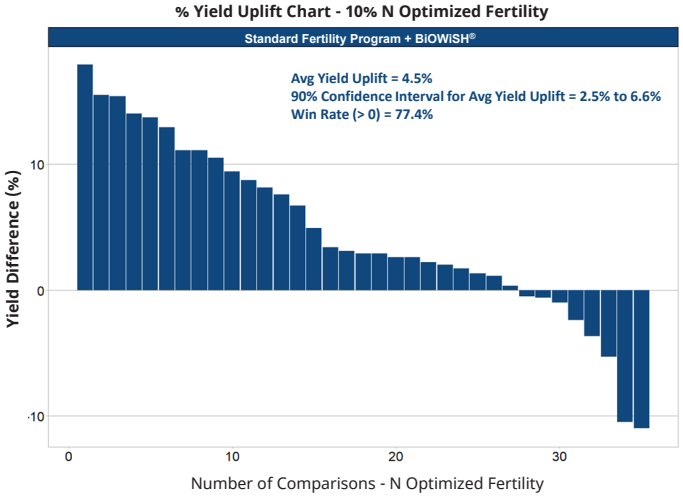

Figure 2: Even with a 10% reduction in fertilizer rates, the addition of BiOWiSH® to an N Optimized* Fertility Program wins over the full fertility Control, 77.4% of the time on average. The average yield uplift of 4.5% over the Control is statistically significant in this meta analysis.

*N Optimized Program indicates a 10% reduction in the standard fertilizer program for the treatment area. Growers should always make their own risk assessment decisions, based on their current needs and situations. This data is effective as of April 2023. Win rates are subject to change.