Research Study

BiOWiSH® Crop Liquid

Evaluation of BiOWiSH® Crop Liquid on Corn Yields in Illinois


Corn

Executive Summary

BiOWiSH Technologies, Inc. engaged with SGS as a third-party Contract Research Organization (CRO) to conduct a study to determine the effects of BiOWiSH® Crop Liquid coated onto urea for corn production in the U.S. midwestern state of Illinois.

The trial compared two treatments:

- Control, Standard Fertility Program
- Control + BiOWiSH® Crop Liquid

In this study, Control + BiOWiSH® Crop Liquid treatment was observed to have a marketable yield of 3.7% higher than the Control treatment.

Background

About BiOWiSH Technologies
Headquartered in Cincinnati, Ohio, BiOWiSH Technologies, Inc. is a global provider of biotechnology solutions. As a leader in the agricultural market, we help farmers increase crop production sustainably, safely, and cost effectively. Our revolutionary BiOWiSH® Crop Liquid is a blend of proprietary microbial cultures that can be coated onto dry fertilizer or mixed with liquid fertilizers to create an enhanced efficiency fertilizer. BiOWiSH® endophytic *Bacillus* deliver soil nutrients to crops through the rhizophagy cycle creating a symbiotic relationship between the plant and soil microbes. This helps farmers achieve consistent results across a broad range of operating conditions, climates, and environments. By unifying nature and science, BiOWiSH reinvents the way food is grown. For more information, visit biowishtech.com.

BiOWiSH® Crop Liquid

- 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

Available Size

- 264 gal/1000 L

About SGS
SGS is the world's leading testing, inspection and certification company. They operate a network of over 2,500 laboratories and business facilities across 115 countries, supported by a team of 99,500 dedicated professionals. With over 145 years of service excellence, they combine the precision and accuracy that define Swiss companies to help organizations achieve the highest standards of quality, compliance and sustainability.

Objectives

The primary objective of this trial was to evaluate the performance of BiOWiSH® Crop Liquid coated onto urea as an Enhanced Efficiency Fertilizer (EEF) compared to the Control fertility practice on corn production in Illinois. The evaluation focused on corn yield, soil and plant nutrients, and economic benefits for the farmer.

Implementation Program

In this trial, the standard regional fertility program for corn consisted of one application of urea at a rate of 435 lbs/acre (488 kg/ha). This Control program was compared to a program that included the addition of BiOWiSH® Crop Liquid coated onto urea at the same rate of the Control. The trial consisted of two treatments with six replicates in a randomized complete block design (RCBD). At the trial site, corn was planted in accordance with local practices. The crop was non-irrigated. The broadcasted application of urea at 435 lbs/acre (488 kg/ha) occurred at the V2 growth stage. Soil sample cores were taken pre-fertilizer application and post-harvest, while leaf tissue samples were taken at the VT stage and grain samples were collected at harvest for protein and nitrogen analysis. There was no significant disease or pest pressure at the trial location.

Table 1. Treatments, Fertilizers, and Application Timings

Treatment	Fertilizer	Application Rate lbs/acre [kg/ha]	Application Phase
Control	Urea	435 [488]	V2
Control + BiOWiSH® Crop Liquid*	Urea	435 [488]	V2

**BiOWiSH® Crop Liquid used at manufacturer's recommended rate.*

Results

Soil Analysis
Compared to the Control, the soil analysis for the BiOWiSH® treatments demonstrated similar or higher nutrient levels post-harvest as a percentage of pre-treatment values.

Table 2. Soil Analysis Table

Treatment	Sample Timing	Nitrate-N ppm	Phosphorus ppm	Potassium ppm
Control	Pre-treatment	29.3	303	768
	Post-harvest	19.9	181	567
Post-Harvest Percentage of Pre-Treatment Value		**68%**	**60%**	**74%**
Control + BiOWiSH® Crop Liquid	Pre-treatment	29.3	303	768
	Post-harvest	19.4	192	611
Post-Harvest Percentage of Pre-Treatment Value		**66%**	**63%**	**80%**

Tissue Analysis
Compared to the Control, the plant tissue analysis for the BiOWiSH® treatment demonstrated similar nitrogen, phosphorus and potassium levels. Nutrient concentrations rated as high to excessive, indicating effective nutrient availability and enhanced nutrient uptake.

Table 3. Leaf Tissue Nutrients

Treatment	Nitrogen %	Phosphorus %	Potassium %
Control	3.29	0.42	2.55
Control + BiOWiSH® Crop Liquid	3.96	0.43	2.31

In addition to tissue samples, grain samples were collected, and nitrogen concentrations averaged 1.4% (dry weight basis) for both the Control and BiOWiSH® treatment.

Yield Parameters
Measurements of yield are presented in the table below. The Control + BiOWiSH® treatment was observed to have a yield increase of 7.0 bu/acre (0.44 MT/ha) over the Control.

Table 4. Yield Data

Treatment	Moisture %	Yield bu/acre [MT/ha]
Control	16.82	191.4 [12.01]
Control + BiOWiSH® Crop Liquid	16.47	198.4 [12.45]

Economics Analysis
Economic data on corn yield from the study is presented in the table below. The Control + BiOWiSH® Crop Liquid treatment had a profit change of $25 USD/acre ($61 USD/ha) greater than the Control.

Table 5. Yield and Net Income Table

Treatment	Yield bu/acre [MT/ha]	Yield Increase bu/acre [MT/ha]	Yield Increase (%)	Net Income USD/acre [USD/ha]	Profit Change USD/acre [USD/ha]
Control	191.4 [12.01]	-	-	629 [1554]	-
Control + BiOWiSH® Crop Liquid	198.4 [12.45]	7.0 [0.44]	3.7	654 [1615]	25 [61]

**Calculations for conversions between imperial and metric units are based on the original source data; slight rounding differences may occur within reported publication values.*
***Net income is the crop value minus the fertility program cost. It does not account for non-fertility expenses.*
****Profit change is the difference between net income of the respective program and the Control.*

Conclusion

BiOWiSH® endophytic *Bacillus* deliver soil nutrients to crops through the rhizophagy cycle creating a symbiotic relationship between the plant and soil microbes. BiOWiSH® Crop Liquid, when added to a regional standard fertility program, increased corn yield grown in the U.S. midwestern state of Illinois from 191.4 bu/acre (12.01 MT/ha) with the Control to 198.4 bu/acre (12.45 MT/ha) with the Control + BiOWiSH® Crop Liquid treatment. The 3.7% overall yield increase of 7.0 bu/acre (0.44 MT/ha) over the Control increased profit to the grower by $25 USD/acre ($61 USD/ha).

In light of the soil results in Table 2, the higher productivity illustrated that the BiOWiSH® coated treatment maintained similar plant tissue, grain, and soil nutrient levels relative to the Control. This indicates more efficient nutrient conversion when using BiOWiSH® enhanced fertilizer. This enables corn treated with BiOWiSH® coated urea to outperform uncoated urea under standard farming practices while preserving soil fertility for future cropping seasons.

Contact us:
agronomy@biowishtech.com
+1 312 572 6700
biowishtech.com