BiOWiSH® TECHNOLOGIES

Case Study

BiOWiSH® Crop Liquid

Evaluation of BiOWiSH® Crop Liquid on Yield in Garlic

Garlic

Executive Summary

An industry leading agricultural company in China conducted a study to test the effectiveness of BiOWiSH® Crop Liquid coated onto NPK 16-8-16 to create an Enhanced Efficiency Fertilizer (EEF) for garlic production.

The trial compared two treatments:

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

The results indicate that the addition of BiOWiSH® Crop Liquid optimized yield potential by improved nutrient uptake for a grower's garlic program. In this study, a 15.2% (4.82 MT/ha, 2.15 ton/acre) yield increase was observed in the Control + BiOWiSH® treatment, resulting in higher profit.

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

Objectives

This study was conducted to evaluate the efficacy of BiOWiSH® Crop Liquid coated onto NPK 16-8-16 to create an EEF, compared to the Control, a regional standard fertility program for garlic production in Tongxu, Henan Provice, China.

Implementation Program

This study was conducted in a typical field with a loamy soil type and compared the farmer's standard fertilizer program (Control) consisting of 15% organic and 40% inorganic compound fertilizer (NPK 16-8-16) against the Control + BiOWiSH® Crop Liquid treatment. The trial design was a large block side-by-side with 18m^2 (59 sq. ft.) harvested in triplicate for each treatment. The fertilizer application is as below:

Table 1. Treatments, Fertilizers, and Application Timings

Treatment	Application Rate kg/ha [lbs/acre]
Control	1800 [1606]
Control + BiOWiSH® Crop Liquid	1800 [1606]

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

Results

A yield increase of 4.82 MT/ha (2.15 tons/acre) was observed for the BiOWiSH® treatment over the Control.

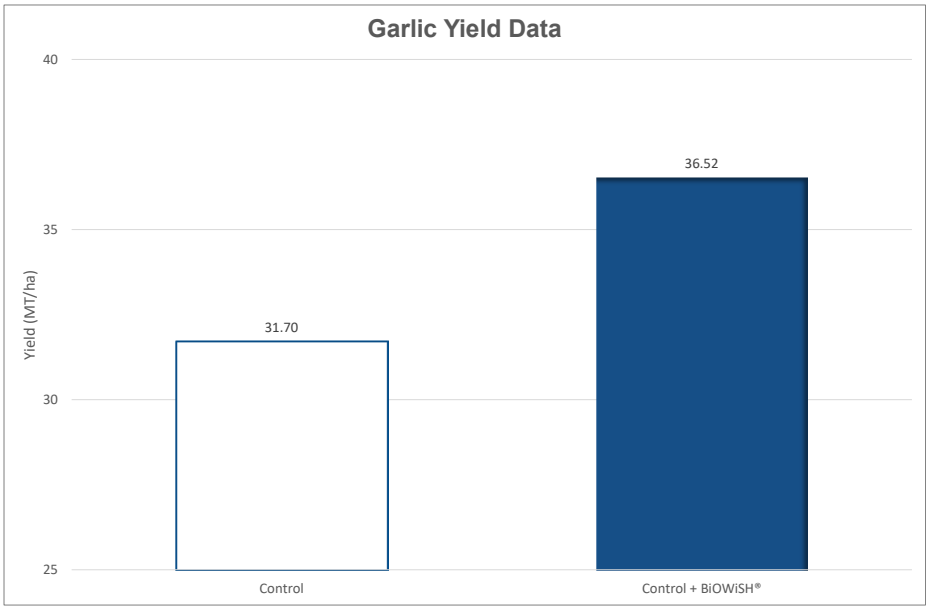

Table 2. Yield and Economics

Treatment	Yield MT/ha [tons/acre]	Yield Increase MT/ha [tons/acre]	Yield Increase (%)	Net Income (%)	Profit Change USD/ha [USD/acre]
Control	31.70 [14.14]	-	-	-	-
Control + BiOWiSH® Crop Liquid	36.52 [16.29]	4.82 [2.15]	15.2	16.27	1201 [486]

**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. This enabled optimized yield potential by improved nutrient uptake, which led to profit changes of $1201 USD/ha ($486 USD/acre) for the Control + BiOWiSH® Crop Liquid treatment in this study.

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