BiOWiSH® TECHNOLOGIES

Research Study

BiOWiSH® Crop Liquid

BiOWiSH® Crop Liquid Increases Cucumber Yield

Executive Summary

A leading agricultural company in China conducted a study to test the effect of organic-inorganic compound NPK fertilizer coated with BiOWiSH® Crop Liquid on cucumber production in China. The trial used today's farming standard of 15% organic matter and 40% inorganic compound NPK fertilizer [15-40 (18-10-12)] as the Control. It was then compared to the Control [15-40 (18-10-12)] coated with BiOWiSH® Crop Liquid. The BiOWiSH® treatment resulted in increased yield, leading to higher profits.

Background

China is a large agricultural country with a vast number of distinct soil types and production environments. Agriculture in China plays a strategic role in the development of the national economy. BiOWiSH Technologies conducted a series of trials on many different crops in China to illustrate the effectiveness of BiOWiSH® Crop Liquid coated onto DAP, Urea, and NPK fertilizers. This research is supported by research conducted in other countries that resulted in increased yields and profitability for farmers.

BiOWiSH® Crop Liquid is a microbial additive that can be added to fertilizer to create an enhanced efficiency fertilizer. BiOWiSH® Crop Liquid Technology enhances root development as well as native microbial activity in the soil, increasing nutrient availability and improving plant vigor. It is proven to enhance the effects of applied fertilizers by optimizing yield potential and improving soil productivity.

Objectives

BiOWiSH Technologies engaged a leading agricultural company in China to measure cucumber crop yield when fertilized with BiOWiSH® Crop Liquid coated onto [15-40 (18-10-12)] fertilizer in Linyi in Shandong Province (China). Costs and results were evaluated to determine how the addition of BiOWiSH® to the fertility program increased farmer's yield and revenue.

BiOWiSH® Crop Liquid

- Optimizes yield potential
- Increases nutrient availability
- Enhances root development
- Improves plant vigor
- Enhances native microbial activity in the soil
- Improves soil productivity

Available Sizes

- 50 gal/190 L
- 264 gal/1000 L

Implementation

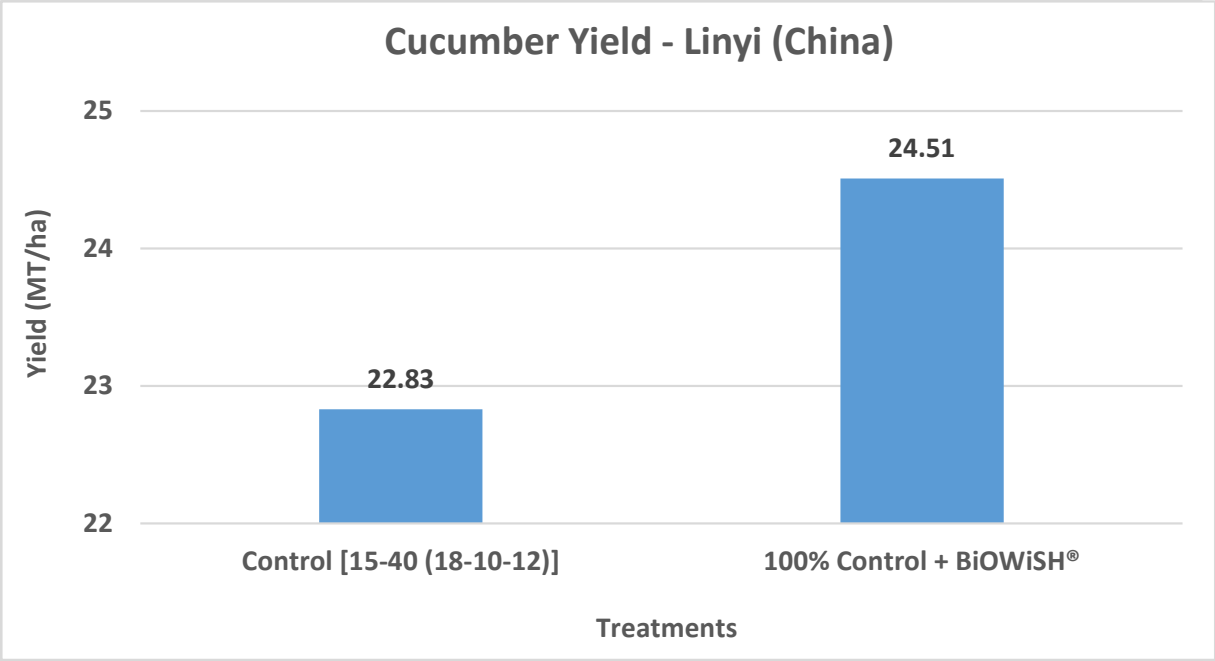
This study was conducted in a typical field with loamy soil. It compared the farmer's normal fertilizer management program against the same farmer program (Control) coated with BiOWiSH® Crop Liquid. Pest and disease management techniques were independent of the study and performed as needed. Each treatment had 3 replicates on 15 square meter plots. The total fertilizer program and application time is detailed in the table below:

Treatment	Base fertilizer lb/ac [kg/ha]	N, P, and K units per hectare		
		N lb/ac [kg/ha]	P_2O_5 lb/ac [kg/ha]	K_2O lb/ac [kg/ha]
Control [15-40 (18-10-12)]	669 [750]	120 [135]	67 [75]	80 [90]
Control [15-40 (18-10-12)] + BiOWiSH®	669 [750]	120 [135]	67 [75]	80 [90]

**15-40 = (15 = 15% organic matter); (40% inorganic - 18% N + 10% P_2O_5 + 12% K_2O)*

Results

The fertilizer treatment coated with BiOWiSH® increased cucumber yield in Linyi by 1.68 metric tons per hectare.



Treatment	Yield tons/acre [MT/ha]	Yield increase tons/acre [MT/ha]	Yield increase %	Net income USD/acre [USD/ha]	Profit change USD/acre [USD/ha]
Control [15-40 (18-10-12)]	10.18 [22.83]	-	-	2,291 [5,661]	-
Control [15-40 (18-10-12)] + BiOWiSH®	10.93 [24.51]	0.75 [1.68]	7.36	2,469 [6,101]	178 [440]

**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.*

When compared to the Control, in the first harvest the BiOWiSH® treatment had 27 more cucumbers with the same weight per cucumber.

Conclusion

This study demonstrates that the application of organic-inorganic compound NPK fertilizer [15-40 (18-10-12)] coated with BiOWiSH® Crop Liquid increased yield by 7.36% and profit by $440 USD/ha ($178/acre). The BiOWiSH® enhanced fertilizer improved plant maturity allowing farmers the opportunity to sell the cucumbers earlier and therefore at a higher price.

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