

BiOWiSH® Crop Liquid

Effects of BiOWiSH® Crop Liquid Coated NPK 15-15-15 Fertilizer on Lettuce Yield and Profitability in China

Executive Summary

BiOWiSH Technologies, Inc. engaged a leading fertilizer manufacturer in China to conduct a study to determine the efficacy of BiOWiSH® Crop Liquid for lettuce production. The trial used the regional standard fertilizer program as the control and compared it to the same fertilizer program with BiOWiSH® Crop Liquid coated onto the fertilizer. The study determined that coating the standard fertilizer program with BiOWiSH® Crop Liquid resulted in higher average yield which positively affected net income and enhanced profitability.

Background

BiOWiSH® Crop Liquid is a microbial biostimulant that can be added to fertilizer to create an enhanced efficiency fertilizer. BiOWiSH® Crop Liquid Technology stimulates native microbial activity and promotes root development, increasing nutrient uptake and improving plant vigor. BiOWiSH® Crop Technology is proven to enhance the effects of applied fertilizers by increasing yield and soil health.

Objectives

The objective of this study was to determine the effects of BiOWiSH® Crop Liquid on yield and economics of lettuce production under field conditions common in southeast China.

Implementation Program

The study was conducted on lettuce (*Lactuca sativa*) in sandy soil in a research field near Guangzhou in the Guangdong Province of China. The treatments were organized as strip-trial with 4 replications. The study compared two fertilizer programs: Control and Control + BiOWiSH® Crop Liquid.

The Control program was a standard grower fertilizer program and was chosen because it was the most common best management practice used by growers in the region, as defined by the cooperator. The Control program included two applications, with a rate of 1050 kg/ha using NPK 15-15-15 and was compared to the same fertilizer coated with BiOWiSH® Crop Liquid at the recommend application rate.

Pest and disease management techniques were implemented when necessary. Fertility program costs, regional crop values, and yields were used to determine net income and net income gain. Treatments are listed in the table below:

Treatment	First Application (15 days after transplanting)	Second Application (35 days after transplanting)	Total NPK units/ha
Control (NPK 15-15-15)	1050 kg/ha	1050 kg/ha	315-315-315
Control (NPK 15-15-15) + BiOWiSH® Crop Liquid (recommend application rate)	1050 kg/ha	1050 kg/ha	315-315-315

BiOWiSH® Crop Liquid



- Improves crop yields
- Increases nutrient availability
- Enhances root development
- Improves plant vigor
- Stimulates native microbial activity in the soil
- Improves soil health

Available Sizes

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

Results

Lettuce yield for the Control program averaged 29.61 MT/ha whereas the Control + BiOWiSH® Crop Liquid treatment averaged 31.51 MT/ha, which is an increase of 6.42%. The additional yield translated to a net income gain of \$624 USD/ha (\$253 USD/ac), which is an increase of 7.06%.

Treatment	Yield MT/ha (US tons/ac)	Yield Increase MT/ha (US tons/ac)	Yield Increase (%)	Net Income USD/ha (USD/ac)	Net Income Gain* (%)	Profit Change** USD/ha (USD/ac)
Control (NPK 15-15-15)	29.61 (13.21)	-	-	\$8856 (\$3584)	-	-
Control (NPK 15-15-15) + BiOWiSH® Crop Liquid	31.51 (14.06)	1.90 (0.85)	6.42	\$9479 (\$3837)	7.06	\$624 (\$253)

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 gain 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

This study demonstrates that BiOWiSH® Crop Liquid coated onto NPK 15-15-15 improved lettuce production under conditions common to the southeast region of China. The improved yield increased profitability and demonstrated that the addition of BiOWiSH® Crop Liquid to a lettuce production program offers a significant return on investment opportunity to the farmer.



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