Research Study

BiOWiSH® Crop Liquid

Evaluation of BiOWiSH® Crop Liquid on Yield in Maize


Maize

Executive Summary

BiOWiSH Technologies engaged gCenseo as a third-party Contract Research Organization (CRO) to conduct a study to determine the effects of BiOWiSH® Crop Liquid enhanced fertilizer on maize production. The trial compared two treatments of grower's standard urea 46-0-0:

- Urea 46-0-0 (Control)
- Urea 46-0-0 (Control) + BiOWiSH® Crop Liquid

This trial was performed as part of a series of trials in Australia. The study determined that BiOWiSH® Crop Liquid increased yield when used with the grower's standard fertilizer management program (Control), which led to higher profits.

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 can be coated onto dry fertilizer or mixed with liquid fertilizer to create an enhanced efficiency fertilizer that optimizes yield potential, expresses plant vigor and improves soil productivity 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.

About gCenseo
gCenseo provides independent agricultural research in evaluation for both crop and non-crop products in Queensland, Australia. Additionally, they provide scientifically based recommendations as part of a consultancy service as well as market research and assurance services.

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

Objectives

The objective of this research study was to determine the effects of BiOWiSH® Crop Liquid technology, manufactured in the USA by BiOWiSH® Technologies, Inc., on maize production when added to a fertility program common to the production area in Queensland, Australia. The focus was on BiOWiSH® Crop Liquid's impact on total harvestable yield in maize.

Implementation Program

This study was conducted as a replicated trial under a randomized complete block trial design with five replications. The trial was planted as a double skip configuration to conserve field moisture. The variety planted was "Buster" and the planting rate was 65,000 plants/ha (26,316 plants/acre). Pest and disease management techniques were independent of the study and performed as needed.

The grower's standard fertilizer management program (Control) was compared to the same program coated with BiOWiSH® Crop Liquid (Control + BiOWiSH®). The Control urea rate was based on the common regional fertilizer recommendations. The urea was applied as a sidedress application.

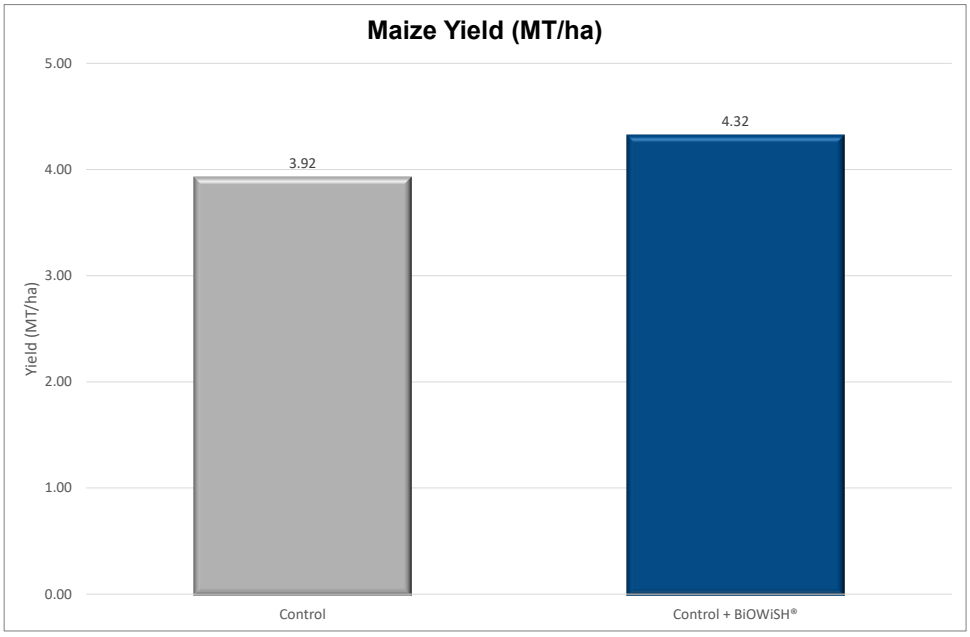
Treatment	Application Rate kg/ha [lbs/acre]	Application Phase
Urea 46-0-0 (Control)	100 [89]	Sidedress
Urea 46-0-0 (Control) + BiOWiSH® Crop Liquid	100 [89]	Sidedress

Results

Normalized Difference Vegetation Index (NDVI)
Normalized Difference Vegetation Index (NDVI) data indicated a significant greening response of BiOWiSH® (0.764) in comparison to the conventional urea program (0.716) at "28-DAA" or 28 Days After Application.

Treatment	NDVI 14-DAA	NDVI 28-DAA
Urea 46-0-0 (Control)	0.689	0.716
Urea 46-0-0 (Control) + BiOWiSH® Crop Liquid	0.720	0.764

Yield
The BiOWiSH® treatment resulted in higher yields in comparison to the grower's standard urea fertilizer program. When coated onto the Control, the BiOWiSH® treatment showed an increased yield of 0.40 MT/ha (0.18 tons/acre).



Economics
Based upon the yield increase of 10.20% for the BiOWiSH® treatment over the Control, net income increased by 10%, resulting in an increased profit of $90 USD/ha ($37 USD/acre).

Treatment	**Yield** MT/ha [tons/acre]	**Yield Increase** MT/ha [tons/acre]	**Yield Increase** (%)	**Net Income** USD/ha [USD/acre]	**Profit Change** USD/ha [USD/acre]
Urea 46-0-0 (Control)	3.92 [1.75]	-	-	847 [343]	-
Urea 46-0-0 (Control) + BiOWiSH® Crop Liquid	4.32 [1.93]	0.40 [0.18]	10.20	938 [379]	90 [37]

**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® coated urea 46-0-0 was evaluated on maize as a sidedress application. In-season measurements showed that there was a significant increase in plant NDVI 28 days after application for the BiOWiSH® treatment over the Control.

The study determined that the BiOWiSH® Crop Liquid fertilizer program increased yield over the Control by 10.20%. The improved yield increased profitability by $90 USD/ha ($37 USD/acre) in maize, demonstrating the addition of BiOWiSH® Crop Liquid to the common regional fertility program offers a significant return on investment opportunity to the farmer.

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