

## BiOWiSH® Crop Liquid

### BiOWiSH® Crop Liquid Increases Yield in Sorghum



#### Executive Summary

This research study was conducted internally by Pacific Seeds in Allora, Queensland to determine the efficacy of BiOWiSH® Crop Liquid in sorghum field cultivation. The study used a standard liquid starter fertility program as a Control and compared it to the same program with BiOWiSH® Crop Liquid mixed with either the Phosphorous (P) or the Nitrogen (N) fertilizer.

This trial was performed as part of a series of trials in Australia. The results of the study show an increase in sorghum yield from the addition of BiOWiSH® Crop Liquid to the standard fertility program when added to the starter fertilizer.

#### 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](http://biowishtech.com).

##### About Pacific Seeds

Pacific Seeds has been at the forefront of the agricultural innovation and research since it was established in Queensland in 1962. Over the last sixty years, they have strived to develop new technology to improve management and operations in the crop production industry by partnering with local and international producers.

### 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 purpose of this study was to determine the impact of BiOWiSH® Crop Liquid mixed with two common fertilizer products on the yield and economic benefits of sorghum production in the state of Queensland in northeastern Australia.

## Implementation Program

The study was conducted in Allora, which is located in the Southern Downs Region of Queensland, Australia. The field was conventional tillage production of sorghum (sorghum bicolor). A completely random block design was adopted. The experiment was set up with three treatments and each treatment had three replicates. There were four rows in each plot, and each row had a length of 100 m (328 ft). The study included three fertilizer treatments: Control, Control + BiOWiSH® Crop Liquid added to the Phosphorous (P) fertilizer and Control + BiOWiSH® Crop Liquid added to the Nitrogen (N) fertilizer. The Control is a standard conventional grower fertilizer program, which is defined as the conventional program used by growers in the area according to Pacific Seeds. The trial design is as follows:

Treatment	Fertilizer	Application Rate L/ha [gal/acre]	Application Phase
Control	(P) fertilizer 9-11-0-0	70 [7]	In-furrow at planting
	(N) fertilizer 43-0-0	200 [21]	Banded at planting
Control + BiOWiSH® added to P Fertilizer	(P) fertilizer 9-11-0-0	70 [7]	In-furrow at planting
	(N) fertilizer 43-0-0	200 [21]	Banded at planting
Control + BiOWiSH® added to N Fertilizer	(P) fertilizer 9-11-0-0	70 [7]	In-furrow at planting
	(N) fertilizer 43-0-0	200 [21]	Banded at planting

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

## Results

Both starter fertilizer programs mixed with BiOWiSH® Crop Liquid showed increases in yield. The use of a Phosphorous (P) fertilizer with BiOWiSH® Crop Liquid demonstrated a 3.5% yield increase, while the use of a Nitrogen (N) fertilizer demonstrated a 3.8% yield increase.

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]
Control	6.25 [2.79]	-	-	1143 [463]	-
Control + BiOWiSH® added to P Fertilizer	6.47 [2.88]	0.22 [0.10]	3.5	1187 [480]	44 [18]
Control + BiOWiSH® added to N Fertilizer	6.49 [2.89]	0.24 [0.11]	3.8	1185 [479]	42 [17]

\*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

This study demonstrates that the addition of BiOWiSH® Crop Liquid to the local standard fertilizer program in Allora, Queensland increased sorghum yield by 3.5% with a Phosphorous (P) starter, and 3.8% with a Nitrogen (N) starter — demonstrating efficacy in varying fertilization conditions. This resulted in a respective profit change of \$44 USD/ha (\$18 USD/acre) and \$42 USD/ha (\$17 USD/acre).

The use of BiOWiSH® Crop Liquid resulted in improved sorghum production, proving a significant return on investment opportunity for the grower.



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