

## BiOWiSH® Crop Technology

### BiOWiSH® Crop Additive Increases Rice Yield in Multiple Vietnamese Soil Types



#### Executive Summary

The Vietnam National Field Fertilizer Testing Department conducted a study to test the effect of BiOWiSH® Crop Liquid Green Choice coated urea on rice production in Vietnam. The trial used today's farming standard (urea fertilizer) as the control. It was then compared to 2 treatments: the control coated with BiOWiSH® Crop Liquid Green Choice and reduced control coated with BiOWiSH® Crop Liquid Green Choice. In both cases, the BiOWiSH® treatments resulted in increased yield, leading to higher profits.

#### Background

Vietnam is a highly agrarian country with rich alluvial deltas and mountainous areas, each with distinct soil types. BiOWiSH Technologies has conducted a series of trials on numerous crops in Vietnam to illustrate the effectiveness of BiOWiSH® coated urea and NPK fertilizers. The research in Vietnam is supported by additional research that has been conducted in other countries which also resulted in increased yields and profitability for farmers.

BiOWiSH® Crop Liquid Green Choice helps increase nutrient uptake in plants, improve plant vigor, stimulate microbial activity in the soil, and promote root development. BiOWiSH® Crop Liquid has been shown to enhance the effects of applied fertilizers by increasing yield and soil health.

#### Objectives

BiOWiSH® Technologies engaged the National Field Fertilizer Testing Department in Vietnam to measure yield of rice when fertilized with BiOWiSH® Crop Liquid Green Choice coated urea (46.3-0-0). The study was conducted in the Hau Giang and An Giang Provinces of Vietnam.

#### BiOWiSH® Crop Liquid Green Choice



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

#### Available Sizes

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

## Implementation

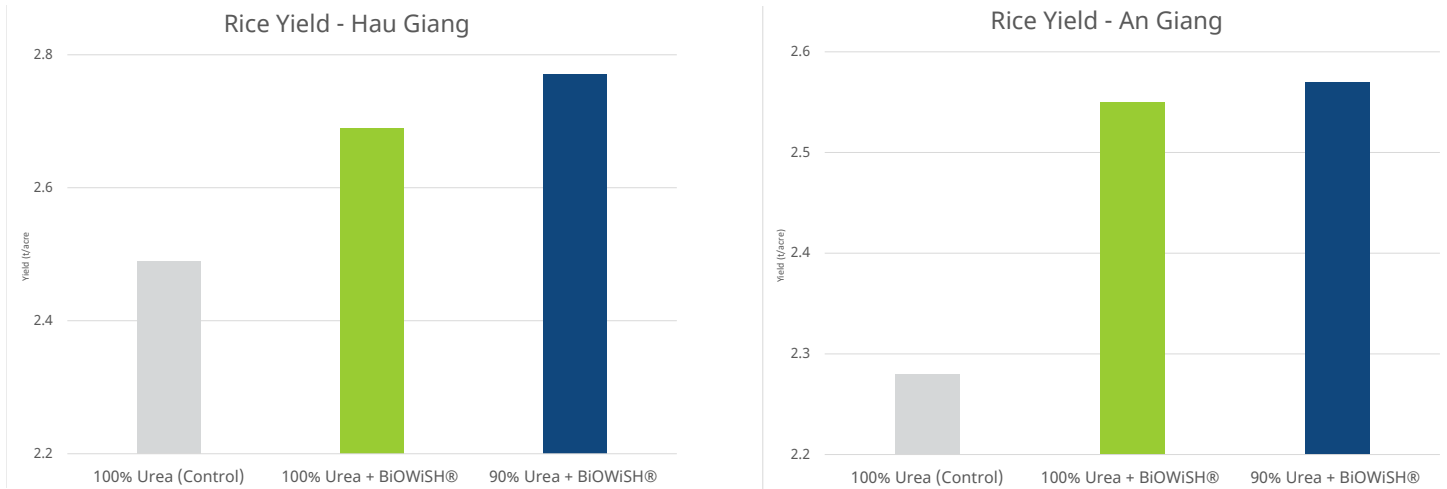
These studies were conducted in two different soil types. Hau Giang Province has acid sulphate soil while An Giang Province has a neutral pH, alluvial soil. Both studies were conducted in typical fields. The studies compared the farmer's normal fertilizing management program using standard urea (Control), standard urea coated with BiOWiSH®, and a reduced rate of standard urea coated with BiOWiSH®. Pest and disease management techniques were independent. Costs and yields were evaluated to determine how the addition of BiOWiSH® to the fertilizing program increased the farmer's yield and revenue. The studies had a randomized plot layout with four replicates. The total fertilizer program and application time for each location were identical, and detailed in the tables below.

Treatment	First Application (1 day after transplanting) lb/acre [kg/ha]		Second Application (10 days after transplanting) lb/acre [kg/ha]		Third Application (30 days after transplanting) lb/acre [kg/ha]		Fourth Application (45 days after transplanting) lb/acre [kg/ha]		Fifth Application (flower development) lb/acre [kg/ha]	
	Urea/ Urea+ BiOWiSH®	DAP	Urea/ Urea+ BiOWiSH®	DAP	Urea/ Urea+ BiOWiSH®	DAP	Urea/ Urea+ BiOWiSH®	DAP	Urea/ Urea+ BiOWiSH®	DAP
100% Urea (Control)	44.61 [50.0]	44.61 [50.0]	44.61 [50.0]	35.69 [40.0]	44.61 [50.0]	35.69 [40.0]	44.61 [50.0]	35.69 [40.0]	26.77 [30.0]	26.77 [30.0]
100% Urea + BiOWiSH®	44.61 [50.0]	44.61 [50.0]	44.61 [50.0]	35.69 [40.0]	44.61 [50.0]	35.69 [40.0]	44.61 [50.0]	35.69 [40.0]	26.77 [30.0]	26.77 [30.0]
90% Urea + BiOWiSH®	40.15 [45.0]	40.15 [50.0]	40.15 [45.0]	35.69 [40.0]	40.15 [45.0]	35.69 [40.0]	40.15 [45.0]	35.69 [40.0]	24.09 [27.0]	24.09 [30.0]

Treatment	Total Fertilizer for the whole season lb/acre [kg/ha]			Total NPK for the whole season lb/acre [kg/ha]		
	Urea/ Urea + BiOWiSH®	DAP	KCl	N	P	K
100% Urea (Control)	205.20 [230.0]	115.98 [130.0]	62.45 [70.0]	115.27 [129.20]	53.35 [59.80]	37.47 [42.0]
100% Urea + BiOWiSH®	205.20 [230.0]	115.98 [130.0]	62.45 [70.0]	115.27 [129.20]	53.35 [59.80]	37.47 [42.0]
90% Urea + BiOWiSH®	184.68 [207.0]	115.98 [130.0]	62.45 [70.0]	105.83 [118.62]	53.35 [59.80]	37.47 [42.0]

## Results

The BiOWiSH® treatment increased rice yields in both Hau Giang and An Giang provinces for the winter-spring growing season.



Hau Giang Treatments	Yield t/acre [t/ha]	Yield Increase t/acre [t/ha]	*Yield Increase %	Crop Value (USD/acre)	Total Cost (USD/acre)	Net Income (USD/acre)	Net Income Gain %
100% Urea (Control)	2.49 [5.58]	-	-	\$894.36	\$26.99	\$867.37	-
100% Urea + BiOWiSH®	2.69 [6.02]	0.20 [.44]	7.88	\$965.58	\$29.15	\$936.43	7.96
90% Urea + BiOWiSH®	2.77 [6.20]	0.28 [.62]	11.11	\$994.31	\$26.79	\$967.52	11.54

An Giang Treatments	Yield t/acre [t/ha]	Yield Increase t/acre [t/ha]	*Yield Increase %	Crop Value USD/acre	Total Cost USD/acre	Net Income USD/acre	Net Income Gain %
100% Urea (Control)	2.28 [5.10]	-	-	\$817.80	\$26.99	\$790.81	-
100% Urea + BiOWiSH®	2.55 [5.71]	0.27 [0.61]	11.96	\$915.52	\$29.15	\$886.37	12.08
90% Urea + BiOWiSH®	2.57 [5.76]	0.29 [0.66]	12.94	\$924.18	\$26.79	\$897.39	13.47

\*Yield Increase % calculated before rounding

## Conclusion

The rice trials above demonstrate that the application of urea coated with BiOWiSH® Crop Liquid Green Choice increases farmers yield and net income gain by up to 13% when compared to the standard fertilizer program. This is evident in different growing seasons, soil types, and environmental conditions.



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