Research Study

BiOWiSH® Crop Liquid

Evaluation of BiOWiSH® Crop Liquid on Yield in Corn Silage


Corn Silage

Executive Summary

BiOWiSH Technologies engaged Helena Agri-Enterprises, LLC as a third-party Contract Research Organization (CRO) to conduct a study to determine the effects of BiOWiSH® Crop Liquid on corn silage when mixed with UAN 32% as part the standard liquid fertility program. The study evaluated plant quality with a focus on total fresh yield measured in tons/acre.

The trial compared two treatments:

- A common regional fertilizer program (Control)
- The same fertilizer program with BiOWiSH® Crop Liquid added (Control + BiOWiSH®)

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.

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

About Helena Chemical Company
Helena Agri-Enterprises is a leading provider of crop production and crop protection products in the United States and worldwide. Headquartered in the USA, the company has been in the agronomic products supply business for more than 50 years and has expanded their contract research services over the last decade. As an independent CRO, Helena R&D is a team of highly trained and experienced study directors, field researchers, and support staff. They are one of several independent CROs that BiOWiSH Technologies, Inc. works with to independently evaluate our agronomy products.

Objectives

The objective of the trial was to determine the effects of BiOWiSH® Crop Liquid on fresh corn silage when added to the standard fertility program.

Implementation Program

This trial was conducted in a commercial silage corn field near Los Banos, CA. The field was planted in late-June, and the Control program consisted of a sidedress fertilizer application in mid-July at the rate of 55 gallons of fertilizer blend per acre (UAN 32% + Hydra-Hume + Trafix Zn) or 514.5 L/ha. The trial was set up in a split block with the BiOWiSH® treatment in an 18.2 acre (7.37 ha) treated section on the field. BiOWiSH® Crop Liquid was mixed with the liquid fertilizer at the manufacturer's recommended rate. The balance of the field received the standard fertilizer treatment. Plant height was measured at 10 different points on the treated and untreated sides of the field. Primary ear length, diameter and number of kernel rows were measured at these sites. Additionally, crude protein, TDN (total digestible nutrients) and RVF (relative feed value) were calculated from harvest samples.

Commercial yield weights were collected by recording weights of the truck loads from the treated section of the field and the truck loads from the grower standard section. The area harvested from each section was measured to determine fresh weight yield/acre.

Treatment	Fertilizer	Application Rate gal/acre [L/ha]	Application Phase
Control	UAN 32% N	52.5 [491.1]	Sidedress
	Hydra-Hume	2.0 [18.7]	
	Trafix Zn	0.5 [4.7]	
Control + BiOWiSH®	UAN 32% N	52.5 [491.1]	Sidedress
	Hydra-Hume	2.0 [18.7]	
	Trafix Zn	0.5 [4.7]	

**Hydra-Hume® and Trafix Zn® are registered trademarks of Helena Holding Company.*
**BiOWiSH® Crop Liquid used at manufacturer's recommended rate.*

Results

There was a notable response in quality from the addition of BiOWiSH® observed in ear development measurements. Plant samples were collected and measured across ten sites within the plot areas. There were significant increases in ear length, ear diameter and kernel rows. Post-harvest silage samples also showed higher values for crude protein, total digestible nutrients (TDN) and relative feed value (RFV) for the BiOWiSH® treatment.

Treatment	Ear Characteristics			Feed Quality Analysis		
	Ear Length in [cm]	**Ear Diameter** in [cm]	**Kernel Row Count** # kernels	**Crude Protein** (%)	**TDN** (%)	**RFV**
Control	9.8 [25]	20.1 [51]	14.9	8.07	67.5	141
Control + BiOWiSH®	10.2 [26]	20.8 [53]	15.7	8.31	69.3	174

Yields were measure with scales on the haulout trucks. The overall weight of silage was corrected for acreage to a "ton/acre" standard. The results show that BiOWiSH® Crop Liquid increased yield by 5.99 ton/acre (13.43 MT/ha) for a 32.9% increase over the Control. Overall, this yield increase led to a profit change of $198 USD/acre ($490 USD/ha).

Treatment	**Yield** tons/acres [MT/ha]	**Yield Increase** tons/acre [MT/ha]	**Yield Increase** (%)	**Net Income** USD/acre [USD/ha]	**Profit Change** USD/acre [USD/ha]
Control	18.18 [40.75]	-	-	525 [1297]	-
Control + BiOWiSH®	24.17 [54.18]	5.99 [13.43]	32.9	723 [1787]	198 [490]

**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® Crop Liquid, as part of a regional fertilizer program, showed excellent response in plant growth and yield. Ear length, ear diameter, and kernel rows increased in individual plant measurements. The post-harvest quality measurements of crude protein, TDN and RFV increased as well. These factors led to a 32.9% higher yield and a profit change of $198 USD/acre ($490 USD/ha).

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