BiOWiSH® TECHNOLOGIES

# Research Study

# BiOWiSH® Crop Technology

## Corn Production
## Lares SRL, Buenos Aires, Argentina

### Executive Summary

Adding BiOWiSH® Crop to corn crops results in a significant return on investment (ROI) for farmers. Lares SRL conducted a study to test the effectiveness of BiOWiSH® Crop as a soil spray in a corn field in Argentina. The study compared BiOWiSH® treated crops with crops produced using standard growing methods. BiOWiSH® treated crops had an increased yield, with higher kernel weight and more kernels per ear, resulting in higher profit for food producers.

### Background

Argentina is among the top five producers of many temperate zone field crops, including corn and soybeans in the world. Argentinian agriculture remains advanced because of a willingness to incorporate innovative technologies into their production systems. Growers are always looking for cost-effective ways to meet consumer demand while using less land and conserving soil, water, and energy.

Consequently, BiOWiSH Technologies, in partnership with Biovaritech SRL, ran third-party research trials in Argentina to investigate the benefits of BiOWiSH® Crop as a soil spray on corn. These trials were run by Lares SRL.

### Objectives

The objective of this research study was to determine the effectiveness of BiOWiSH® Crop for increasing yield and profit when added to the standard best management practice in corn production. BiOWiSH® Crop products are manufactured by BiOWiSH Technologies, Inc. in the USA.

### Solution

BiOWiSH® Crop is a biological fertilizer additive that helps increase nutrient uptake in plants, improves plant vigor and stimulates microbial activity in the soil. Growers, distributors and institutions have reported that using the BiOWiSH® Crop technology improves crop yields and quality, adding directly to the farmer's bottom line.

### Implementation Program

This study was conducted near Carmen de Areco, Buenos Aires, Argentina with DK7210 corn hybrid at a seeding rate of 84,000 plants per hectare (33,993 plants per acre). BiOWiSH® Crop was dissolved in water, agitated for 15 minutes, and applied via a sprayer to soil surface immediately after planting. All other management practices were the same for the treatment and control.

## BiOWiSH® Crop


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

### Available Sizes

- 100g/3.5oz
- 1kg/2.2lbs
- 5kg/11lbs
- 10kg/22lbs

## Methods

Treatments were organized as a randomized complete block design with four replications. Plot size was four rows wide (52 cm apart) (20.5 inch) by seven meters (23 ft.). The following treatments were evaluated:

| Treatment Name | BiOWiSH® (kg/ha) [lb/acre] | Single Superphosphate (kg/ha) [lb/acre] | MAP (kg/ha) [lb/acre] | Urea (kg/ha) [lb/acre] |
|---|---|---|---|---|
| **Grower Standard** | - | 150 [134] | 100 [89] | 150 [139] |
| **BiOWiSH®** | 0.5 [0.45] | 150 [134] | 100 [89] | 150 [139] |

Single Superphosphate (0-21-0-12S) was applied by broadcast method six months prior to planting.

Monoammonium phosphate (MAP 11-52-0) was applied at planting and Urea (46-0-0) was applied by broadcast two weeks after planting.

The following characteristics were observed to determine the effects of BiOWiSH® Crop as a soil spray for corn production:

1. Plant Stand
2. Number of Kernels per ear
3. Kernel Weight
4. Grain Yield
5. Active Leaves

In addition, an economic comparison of the crop yield of the treatment was performed to determine a financial benefit to corn producers, based on current figures for Argentina.

## Results

### Crop Performance:

The BiOWiSH® treatment increased crop yield, resulting in an additional 1,093 kg yield per hectare (975 lb/acre) over the grower standard.

The BiOWiSH® treatment also resulted in increased number of kernels per ear, and an increase in kernel size. These may be due to a higher number of photosynthetically active leaves during the grain filling period.

| Treatment Name | Active Leaves | Plant Stand (pl/ha) [pl/acre] | Number of Kernels (kernels/ear) | 1,000 Kernel Weight (g) [Oz] | Grain Yield (kg/ha) [lb/acre] |
|---|---|---|---|---|---|
| **Grower Standard** | 14 | 77,610 [31,407] | 548 | 342 [12] | 13,357 [11,916] |
| **BiOWiSH®** | 15 | 77,610 [31,407] | 575 | 373 [13] | 14,450 [12,891] |

### Economics:

Profit increase by 145 USD per hectare (59 USD /acre) for the BiOWiSH® treatment group, when compared with the grower standard. BiOWiSH® Crop treatment resulted in a significant ROI of 846%.

| Treatment Name | Gross Income (USD/ha) [USD/acre] | Profit[1] (USD/ha) [USD/acre] | ROI (%) |
|---|---|---|---|
| **BiOWiSH®** | $2,139 [$866] | $145 [$59] | 846% |

[1]Relative to Grower Standard.

## Conclusion

BiOWiSH® Crop was shown to improve grain corn yield and kernel size, resulting in increased profit and a significant ROI for corn producers. Grain yield increased by 1,093 kg per hectare (975 lb/acre) and profit increased by 145 USD/ha (59 USD/acre) for the BiOWiSH® treatment crops, when compared to grower standard crops. Soil spraying immediately after planting was found to be an effective method of application.

BiOWiSH® Crop presents a significant opportunity for growers to produce more corn without requiring additional land resources. Most importantly, this study demonstrates BiOWiSH® Crop has a significant return on investment opportunity for growers.

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