BiOWiSH™ TECHNOLOGIES

Case Study

Hydroponics

A & D Manno Hydroponics, Australia

Background

A & D Manno Hydroponics, owned and operated by Adam and Damien Manno, is located in Kulda, South Australia. The facility produces hydroponically grown Bok Choy, an Asian leafy vegetable, and a variety of herbs in a single 13,000 sq ft greenhouse. They use a traditional greenhouse management program that includes the use of a nutrient solution mix.

After harvesting a "control" crop, A & D Manno Hydroponics applied *BiOWiSH™-Hydroponic* in addition to the traditional program for the next growth cycle. Both treatment protocols measured yield and Brix (sugar content measure) in Bok Choy and Brix in Sweet Basil, while also observing health and vigor of all plants in the system.

Treated Sweet Basil growing in the Greenhouse on NFT tables

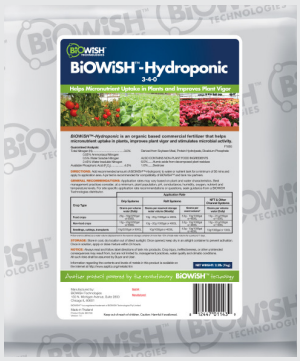
BiOWiSH™-Hydroponic

Benefits experienced from using BiOWiSH™-Hydroponic:

- Improved yield
- Improved plant vigor
- Increase in total number of crops per annum
- Increased nutrient availability to plants
- Improved water quality and clarity
- Reduced sludge and algae accumulation
- Reduced habitat for fungal spores
- 100% natural and non-toxic

Available Sizes

- 8 x 10 gram (tea bags)
- 75 x 10 gram (tea bags)
- 2.2lb
- 11lb



Site Information

The A & D Manno Hydroponics facility grows plants on NFT (Nutrient Film Technique) tables in a 13,000 sq ft plastic covered greenhouse.

The greenhouse produces Bok Choy and a number of herb varieties including Sweet Basil (the predominant variety), Continental & Curly Parsley, Dill, Thyme, Sage, Oregano, Mint and Coriander. The greenhouse will typically produce up to 22,000 individual plants per rotation.

An automatic misting system controls the temperature and humidity in the greenhouse. The system is programed to maintain temperature at 80 ˚F and 75% humidity.

A 1,320 gallon in-ground tank supplies the nutrient solution to the NFT tables using reverse osmosis treated water. The stock solution (Parts A & B) is manually added to the nutrient solution on a daily basis. The management practice includes maintaining an Electrical Conductivity (EC) of 1.0 to 1.3 mS/cm.

BiOWiSH™-Hydroponic Application

BiOWiSH™-Hydroponic was added directly into the 1,320 gallon nutrient solution tank on a daily basis at a rate of 10ppm (1.8oz) for a period of 21 days. At the end of this period, Bok Choy was weighed and analyzed for Brix levels to compare the BiOWiSH™ treated and "control" crops. Brix levels were also measured in the Sweet Basil for comparison between the two treatment programs.

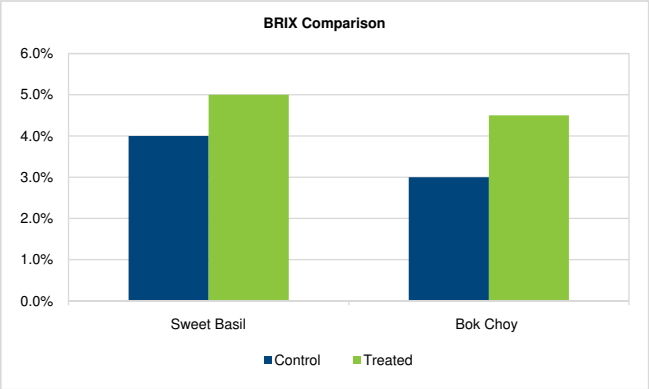
The total product cost for the application for the entire growth cycle was $0.01 per plant.

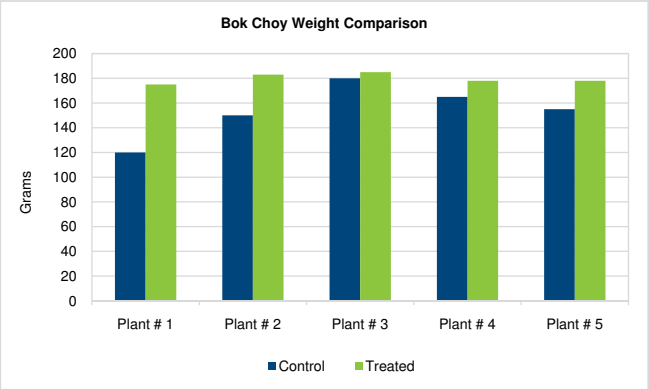
Application Data Results

BiOWiSH™ treated Bok Choy produced an average yield weight increase of over 14%. The traditional management program average weight was 5.4oz. In comparison, the BiOWiSH™ average weight was 6.4oz.

The Brix levels in the BiOWiSH™ treated Sweet Basil increased from 4% to 5%. A significant rise in Brix levels was also experienced in the BiOWiSH™ treated Bok Choy which increased from 3% to 4.5%.

The data sets are shown below.





Application Outcomes

After applying BiOWiSH™ to their nutrient solution, A & D Manno Hydroponics noticed the following benefits:

- Increased yield
- Increased Brix
- Improved vigor and health of Sweet Basil and Bok Choy
- Improved palatability
- More consistent growth pattern

"We noticed that the treated plants grew more consistently and are more healthy and vibrant than we have seen them before. The increase in yield weight was also noticeable when we harvested the Bok Choy, as was the improved palatability. We have continued to use the product beyond the trial and would recommend it to other Hydroponic farming operations"
– Adam and Damien Manno

About BiOWiSH™-Hydroponic

The result of over 18 years of research and development, BiOWiSH™ is a powerful blend of biocatalysts that speeds up biochemical reactions at a rate faster than unaided processes or current technologies. 100% natural and non-toxic, BiOWiSH™ is safe for everyday use in a very diverse range of consumer and industrial applications. Developed specially for the Hydroponics industry, *BiOWiSH™-Hydroponic* is a revolutionary water treatment solution that helps increase nutrient availability, improve plant vigor, and stimulate microbial activity while preventing sludge build-up and problematic scaling in dripper lines, micro-tubes and Nutrient Film Technique (NFT) gulley floors.

Contact

Crop King, Inc

134 West Drive

Lodi, OH 44254

Web: www.cropking.com

Toll Free: +1 800 321 5656

Manufacturer

BiOWiSH Technologies

Tel: +1 312 572 6700

Web: www.biowishtech.com

Biological help for the human race

www.biowishtech.com

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