BiOWiSH™ TECHNOLOGIES

Case Study

Hydroponics

Lettuce Trial, CropKing, USA

Background

CropKing's new research greenhouse was completed in early 2011 for the purpose of testing new products, plant varieties and items related to the Hydroponic industry. The research greenhouse has a hydroponic Dutch Bucket system and hydroponic NFT leaf crop system.

The state of the art testing facility has two separate hydroponic NFT channel systems consisting of 30 channels on each side (360 plants) allowing for side by side testing of different growing methods, nutrient solutions and new products intended for use in the hydroponics industry. Each system re-circulates the nutrient solution with its own tank, pumps and nutrient monitor/controller.

Each side is divided into 5 groups of 6 channels each allowing for a weekly harvest schedule. For comparison between the BiOWiSH™ treated and untreated (control) systems, CropKing's research staff randomly harvest 10 heads of lettuce. The weekly harvest weights are compiled as part of the economic and performance evaluation.

Hydroponic Nutrient Solution

The nutrient solution was formulated following CropKing's guidelines for hydroponic lettuce production and maintained as follows:

- Electrical Conductivity 1.9 (mS/cm)
- pH 5.8
- Solution Temperature 18-20^{O}C

Implementation

In addition to the normal practice, *BiOWiSH™-Hydroponic* was added on a daily basis into one of the nutrient solution tank systems. The control system also maintained normal environmental, nutrient solution and other management practices. *BiOWiSH™-Hydroponic* was applied at the rate of 10 ppm or 10 grams of BiOWiSH™ per 1,000 litres.

BiOWiSH™-Hydroponic Benefits

- Improves yield
- Reduces growth time - more harvests per year
- Improves nutrient availability
- Improves consistency across harvest
- Improves root development
- Better plant health (vigor)
- Improves budding
- Longevity of flowering
- Storage stability

Available Sizes

Tea Bag Box

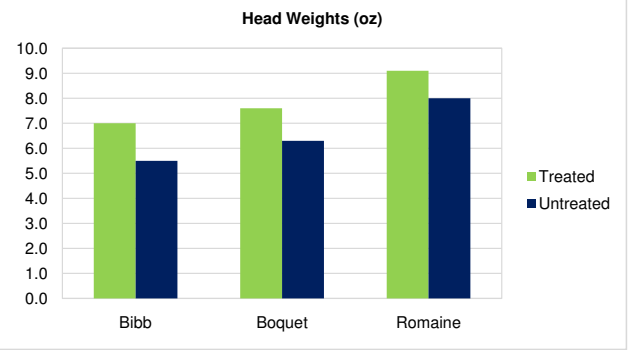
- 8 x 10g
- 75 x 10g

Powder Bag

- 100g/3.5oz
- 1kg/2.2lb
- 5kg/11lb

Results

Harvest of 10 random heads without roots out of a group of 36 plants. The results is average weight per head.



Observations by CropKing

The addition of *BiOWiSH™-Hydroponic* into the nutrient solution noticeably increases the growth rate of lettuce compared to lettuce grown without *BiOWiSH™-Hydroponic*. Lettuce grown with *BiOWiSH™-Hydroponic* is ready for harvest 4-5 days before the untreated crop. The result of a quicker crop time translates to more crop rotations per year. Current test results show an increase in head weight on lettuce grown using *BiOWiSH™-Hydroponic* of near 20%. After harvest the BiOWiSH™ treated system channels are cleaner relating to less labor cleaning the channels for replanting. General crop observations: Consistent head shape and size, faster growth during the last 10-14 days of the growth cycle and increased overall appearance in the crop.

Implementation Outcomes

BiOWiSH™ treated lettuce were:

- More consistent head size
- Increased growth rate
- More vibrant color
- Better taste
- Increased production

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.

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