BiOWiSH® TECHNOLOGIES

Case Study

BiOWiSH® Fruit & Vegetable Wash

Improving the Banana Wash Process For Growers and Processors, India

Background

A banana producer in Chamarajanagar near Mysore, India, grows bananas on more than 35 acres. The producer has an agreement with another company for procuring, processing, and packaging the bananas at the banana farm.

Fruit sold for export or packed for domestic organized retail outlets are washed and packed. These fruit are also graded for several key quality parameters.

Objectives

Introduce BiOWiSH® Fruit & Vegetable Wash into the open wash system and monitor the performance and cost versus the control or traditional management practice. BiOWiSH® Fruit & Vegetable Wash is an organic alternative which allows the reduction of chemicals used in the wash pools and improves production issues. The facility tested the efficacy of BiOWiSH® in resolving latex issues, extending the shelf life of bananas and reducing post-harvest defects.

Solution

Manufactured in the United States, BiOWiSH® Fruit & Vegetable Wash is a powerful organic composite biocatalyst product that breaks down complex organic molecules allowing the reduction of chemicals used in the banana wash pools and improving production issues. Previous research has shown BiOWiSH® Fruit & Vegetable Wash is effective at resolving latex issues; increasing storage life; maintaining freshness; making fruit cleaner; reducing the use of harsh chemicals, water and electricity; improving wash and discharge water; and saving man-hours used for cleaning.

Implementation Program

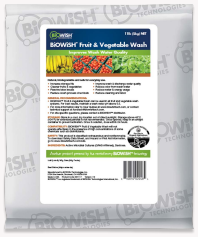
The traditional post-harvest banana processing consists of a two-step program. In the first step, bananas are harvested and brought to the processing area where they are de-handed into small clusters. The banana clusters are put into a water tank (2000-liter capacity) containing aluminum sulfate. The banana fingers are left in the tank for 10 to 15 minutes to remove latex and dust.

In the second step of the traditional process, the clusters are removed from the de-handing tank and transferred to an adjacent wash tank of aluminum sulfate-treated water for a secondary wash for 5 minutes. Following this wash, the bananas are placed on crates for drying and subsequent packing.

In this trial, BiOWiSH® Fruit & Vegetable Wash was dissolved in water and added at 5ppm (mg/L) in place of the aluminum sulfate. The roughly 350 clusters of bananas were soaked in the BiOWiSH® Fruit & Vegetable Wash-treated water for 15 to 20 minutes.

The BiOWiSH® Fruit & Vegetable Wash and the aluminum sulfate treatment protocols were run in parallel.

BiOWiSH® Fruit & Vegetable Wash



- Increases storage life
- Cleaner fruits & vegetables
- Resolves latex issues
- Reduces wash process chemicals
- Reduces odor from wash water
- Reduces water & energy usage
- Reduces cleaning and labor
- Approved under Washington State Department of Agriculture Organic Food Program

Available Sizes

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

Results

As is typical for bananas immediately after de-handling (cutting) the banana cluster from the bunch, the latex began to release from the wound (cut) area. However, the BiOWiSH® treatment resulted in the formation of a precipitation floating on the surface of the water. Though the precipitation was sticky to the touch initially, within 30 minutes the latex precipitation changed to a non-sticky floating precipitation.

Cut ends (pedicel ends) of BiOWiSH®-treated banana clusters were not sticky and bleeding of latex was reduced. The pedicel ends of the aluminum sulfate-treated banana clusters remained sticky to the touch. In addition, the BiOWiSH®-washed bananas were free of latex stains and shiny compared to aluminum sulfate-treated bananas.

Following the wash process the bananas were evaluated daily for crown rot assessment and ripening. In both cases a lower number indicates a higher-grade banana.

Observation of Crown Rot in Representative Clusters of Bananas Stored at Room Temperature (6 Days after Treatment)

SI Number	Grading (0-5)	
	BiOWiSH® Treated	Control Treatment
1	0	2
2	1	1
3	1	2

Observation of Shelf Life in Representative Clusters of Bananas Stored at Room Temperature (6 Days after Treatment)

SI Number	Grading (0-7)	
	BiOWiSH® Treated	Control Treatment
1	2	6
2	2	6
3	2	6
4	2	7
5	2	7
6	2	4
7	2	4
8	2	4
9	2	4
10	3	4
11	3	4
12	2	4
13	2	4
14	2	5
15	2	6
16	2	6
Average	2.1	5.1

Observations 6 Days After Treatment

Aluminum Sulfate Control

BiOWiSH® Treatment

Aluminum Sulfate Control

BiOWiSH® Treatment

Aluminum Sulfate Control

BiOWiSH® Treatment

Observations 9 Days After Treatment

Aluminum Sulfate Control | BiOWiSH® Treatment

Aluminum Sulfate Control

BiOWiSH® Treatment

Aluminum Sulfate Control | BiOWiSH® Treatment

Conclusion

The trial results are consistent with other BiOWiSH® Fruit & Vegetable Wash trials and end-user feedback. When added to the banana-wash process BiOWiSH® Fruit & Vegetable Wash resolves the latex issue, improves the visual quality of bananas, significantly extends the shelf life of bananas, and reduces post-harvest defects.

The benefits associated with the incorporation of BiOWiSH® Fruit & Vegetable Wash clearly increase the volume of exportable bananas. Banana processors in India, like others around the world, improve their operation and economics by implementing BiOWiSH® Fruit & Vegetable Wash into their current practice.

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