

## Fruit & Vegetable Wash

### ACON Group, Costa Rica

#### BACKGROUND

The ACON Group, a company located in Costa Rica, is dedicated to the production and marketing of fruit for export to several markets. The group has 30 banana packing plants, and thus a large amount of water usage for their banana packing operations.

A study implementing BiOWiSH™ Fruit & Vegetable Wash into the ACON banana wash management practice was designed to determine if the product could contribute to ACON's environmental stewardship and optimize their production process. The study evaluated banana latex solutions, chemical use, energy consumption and water savings resulting from improved water quality. Traditionally, the best management practice for controlling the latex issue has been to use high concentrations of harsh chemicals such as chlorine, hydrogen peroxide, coagulants, or other chemicals. This practice requires a high volume of replacement water and daily cleaning of the wash pools.

The study was performed at the Acorsa II facility which is located in Matina Limon, Costa Rica Atlantic area. The property has an open or run to waste banana wash system.

#### 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 recorded water, energy and chemical usage for comparison to the traditional practice. In addition, visual observations of the adhesive nature of the latex were recorded.

#### SOLUTION

Made in the United States, BiOWiSH™ Fruit & Vegetable Wash is 100% natural, bio-degradable and safe for everyday use in a diverse range of applications. It has been shown effective at increasing storage life, maintaining freshness, reducing water and electricity usage, and saving man-hours used for cleaning.

#### BiOWiSH™ Fruit & Vegetable Wash

- Increase storage life
- Cleaner fruits & vegetables
- Resolve latex issues
- Reduce wash process chemicals
- Improve wash & discharge water quality
- Reduce odor from wash water
- Reduce water & energy usage
- Reduce cleaning and labor cost

#### Available Sizes

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



## RESULTS

As displayed in Table 1, the water consumption was significant at 27.8% less water used. Extrapolating over a 30 plant group the total calculated water savings is 936,000m<sup>3</sup> (245,670,000 gals.).

Table 1: Water Consumption Comparison		
Program	Water Consumption per year per plant	
Conventional	29,587,000 gals.	112,320 m <sup>3</sup>
BiOWiSH™	21,397,000 gals.	81,120 m <sup>3</sup>
Difference	8,189,000 gals.	31,200 m <sup>3</sup>

A review of the electrical cost per box of bananas was performed to evaluate the monetary impact of the environmentally friendly solution. The BiOWiSH™ program goal was to reduce electrical cost while improving water consumption and fruit quality. Tables 2 and 3 illustrate the economic impact was very favorable with a 34.4% reduction in kWh usage per box of bananas.

Table 2: Electricity Consumption and Cost in Packing Plant					
	kWh	Cost (USD)	Boxes	Cost of kWh (USD)	kWh/Box
<b>Month 1</b>	7,900	\$1,850	24,657	\$0.23	0.32
<b>Month 2</b>	7,219	\$1,839	24,784	\$0.25	0.29
<b>Month 3</b>	9,316	\$1,936	28,257	\$0.21	0.33
<b>Month 4</b>	7,518	\$1,810	36,539	\$0.24	0.21

Facility commenced use of BiOWiSH™ Fruit & Vegetable Wash in Month 4.

Table 3: Energy Savings	
Average Consumption kWh/box (Before BiOWiSH™)	0.314
Average Consumption kWh/box (After BiOWiSH™)	0.206
Current Savings (Consumption kWh/Box)	0.108
Boxes Packed Per Month (Average)	28,559
kWh Savings/Month	3,085
Average Cost kWh (USD)	\$0.23
Savings/Month (USD)	<b>\$711.18</b>

Electrical energy costs based on average values over trial period.

The final phase of the study was to determine if the amount of chemicals and cleaning products could be reduced primarily due to the removal of the adhesive nature of latex when using BiOWiSH™ Fruit & Vegetable Wash. Once again BiOWiSH™ accomplished the goal by achieving a reduction in the use of harsh chemicals.

Table 4: Facility Cleaning Economic Analysis			
Material		Control Group (Cost/Month)	BiOWiSH™ (Cost/Month)
Cleaning Materials	Chlorine	\$34.48	\$20.69
	Chemical 1	\$58.70	\$44.02
	Chemical 2	\$143.53	\$107.65
	Gloves	\$42.13	\$31.60
	Sponges	\$8.40	\$7.00
Latex Control	Latex Coagulant	\$76.18	\$0.00
<b>TOTAL</b>		\$363.42	\$210.96

In addition to the reduced water consumption, the facility reported a monthly savings of \$359.64 from reductions in the usage of energy and harsh chemicals. The BiOWiSH™ product cost was included in this economic comparison.

Table 5: Savings with BiOWiSH™	
Monthly (Acorsa II)	\$359.64
Yearly (Acorsa II)	\$4,315.68
Yearly (30 Plant)	\$129,470.40

## CONCLUSION

The objective of the study was to determine the performance and cost of introducing BiOWiSH™ Fruit & Vegetable Wash into the banana wash process versus the conventional management practice. The study data and observations by site personnel overwhelmingly demonstrated that the BiOWiSH™ technology achieved all set objectives. The 27.8% water savings, 34.4% energy savings and 42% cleaning savings offer a return on investment which far exceeded the ACON group expectations. The fact that an economic return can be achieved while improving fruit quality and the environment is an all-around win for the ACON group.

## TESTIMONIAL

“The most important thing observed with the use of BiOWiSH™, is the savings in consumption of water resources, and reducing the problem of latex in the quality of the exported fruit.” - Farm Manager

## Contacts

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