

# Increasing Marketable Production of Exotic Tropical Fruit with Protective Covering

*Ken Love (Hawai'i – Farmer/Rancher Grant)*

**Project Number:** FW02-008

**Title:** Increasing Marketable Production of Exotic Tropical Fruit with Protective Covering

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A bagged abiu tree.

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Hawai'i Tropical Fruit Growers

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Bagging yielded this quality abiu.

**Situation:**

Asian farmers have been covering their fruit for hundreds of years to protect its appearance and to increase the length of time the fruit is on the tree, which makes it sweeter. The bags, which also guard against pests, come in a variety of sizes and colors with differing light permeability, wax coverings and chemical impregnations. They typically have a small wire at the top to ease wrapping and slits in the bottom to drain rainwater.

Using the experience of the Asian farmers as a model, the Western SARE project team wanted to assess whether using bags to cover Hawai'i fruit could produce similar results. Success could not only increase the volume of marketable fruits, using bags might expand the types of fruit that could be marketed beyond those traditionally produced.

**Objectives:**

1. Investigate the effects of using protective bags on tropical fruit as a means of increasing production and quality and developing new markets for Hawai'i
2. Assess the value of using the covers as an alternative to chemical treatment
3. Measure the economic impact through market development
4. Disseminate results to growers in the islands

**Actions:**

Members of the West Hawai'i Chapter of the Hawai'i Tropical Fruit Growers, the Kona Pacific Farmers Cooperative and Kona Young Farmers were engaged in several tests to determine the best time for bagging.

The main fruits bagged included loquat, white sapote, mango, lychee, figs and rambutan. Some collaborators also bagged abiu, pineapple, strawberry guava, tomato, zucchini and eggplant.

The bags used in the project, made in Nigata, Japan, are typically used to cover apples, Asian pear, loquat, peaches, grapes and mango to control ripening time, achieve the desired color and prevent pests.



Bagging a lychee tree.



Lychee unbagged.



Lychee bagged

**Results:**

In all cases, the bags effectively controlled pests. The bags also increased fruit value by improving coloration and lengthening tree-hanging time for higher sugar content and extending the growing season.

A surprising result was reduced labor, with the bags' success dramatically reducing time spent culling and inspecting harvested fruit.

The bags successfully protected fruit not normally found in local markets, usually because of insect or bird damage, expanding or opening markets for loquat, white sapote and abiu.

The volume of marketable lychee increased when bagged as did its price per pound. Bagged lychee fetched \$3.50 a pound compared with \$2.75 a pound for unbagged fruit. The additional profit per 1,000 lychee fruits harvested was estimated at \$44 owing to increased quantity, \$24 because of increased quality and \$12 from labor savings. Subtract \$5 for the bags, and the extra profit from bagging comes to \$75 per 1,000 lychees, or \$3,750 per acre.

Bagging mango, figs and guava also proved beneficial, but more testing is needed to determine the best bags. Tests on tomato, pineapple and cucumber are encouraging, but more testing is clearly needed before recommendations can be made.



West Hawai'i Chapter members of Hawai'i Tropical Fruit Growers participate in bagging time trials.

**Potential Benefits:**

Results from this fruit-wrapping project show clear benefits, especially economic. The time saved in the culling and inspecting process outweighs the time it takes to bag the fruit, and the difference in quality is both visible and marketable.

"We believe that as farmers adopt the use of the protective bags, the value of the crop will increase both from quality and quantity," says project coordinator Ken Love. "Use of the bags enables farmers to increase production while staying chemical- and pesticide-free in what they grow and bring to market, thus promoting good stewardship of the land.

### Additional Profit Per 1000 Lychee

\$44.00 Additional Income from Increased Quantity  
\$24.00 Additional Income from Increased Quality  
-\$12.00 Labor Saving  
-\$5.00 Cost of Bags

•\$75.00 Extra Profit from Bagging



This wax-coated bag allows 46% light transmission.



The light wax coating allows 50% light transmission.



Bagged fruit on the tree helps regulate ripening.