

No Chill Stone Fruit for Hawaii

Final Report for FW09-002

Project Type: Farmer/Rancher

Funds awarded in 2009: \$9,528.00

Projected End Date: 12/31/2010

Region: Western

State: Hawaii

Principal Investigator:

[Ken Love](#)

Hawaii Tropical Fruit Growers

Project Information

Abstract:

Growers on small family farms in Hawaii are always looking for varieties of niche market crops that differ from crops that their neighbors might offer for sale and for greater diversification. Chefs express an increasing interest in fruit grown locally, which may include fruits that do not normally grow in a tropical environment. The purpose of this project was to research and investigate options for peaches and plums of the *Prunus* species that may produce at lower elevations (300') in Hawaii.

A number of plum (*Prunus mume*) plants were obtained and distributed to project cooperators. The project coordinator also obtained a number of "low-chill" peaches for grafting onto plums, which had previously been shown to produce at low Hawaiian elevations.

The peach varieties sold at the nurseries in Hawaii had little or no success to produce in Hawaii except for locations higher than 3000' elevations. The standard commercial *Prunus* rootstock used for the peach varieties requires an average of 1,400 hours of chill time, which does not take place at farm locations in Hawaii. The project coordinator speculated that some of the chill time requirements must transmutate from the stock to the low-chill peach variety.

Grafting of the varieties to the *Prunus mume* rootstock showed that some of the peach varieties would produce at 500-foot elevations. The *Prunus mume* would also produce acceptable plums which chefs have asked for in much greater quantities than currently in production. This project has opened up many new diversification possibilities for growers in the Kona district.

Project Objectives:

The project was able to meet the objectives stated in the original proposal by propagating and purchasing trees for project cooperators. The project coordinator was able to research additional varieties of low-chill plums and peaches that might be able to produce in Hawaii. Some of these will remain under test until they can be propagated and shared with grower-cooperators. Plums were given to American Culinary Association chefs, who developed recipes and communicated with other

chef members. One chef was given a few peaches, which the project found was much slower to develop than plums, to test. Growers will continue to develop and work with these Prunus species to build the waiting market. The project was also successful in grafting the low-chill peaches to the no-chill plum rootstock. A few peaches have developed from these grafts, but more time will be needed to determine yield and other data. Cooperators will continue to work with these fruits.

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Research

Research results and discussion:

The propagation and distribution of *Prunus mume* to the project collaborators from 300- to 3,000-foot elevations showed mixed results. One collaborator's tree died. The other six had mixed growth rates, with one exceeding the normal rate of about two meters per year. None of the trees have flowered yet but are expected to in the next year or two. The collaborators have expressed their desire to keep monitoring the trees and report back to the fruit growers group. They have also mulched the trees to promote root shoots for propagation in order to use these as rootstock for other *Prunus*.

The project coordinator has continued to propagate the *Prunus mume* as well as collect different varieties of peaches and plums reported to be low-chill. During the project numerous grafts were made from low-chill peaches such as Tropic Snow (200 chill units), Tropic Beauty, (150 chill units), Tropic Sweet (175 chill units) and Florida Prince (150 chill units). These commercial peach trees were grafted on Nemaguard (800 chill units), Hansen and other un-named rootstocks requiring much greater chilling time (upwards of 400 to 1,000 hours). Research reports from universities in Texas and Florida stated that many plum rootstocks (genus species) would not be compatible with low-chill peaches. The no-chill project rootstock, *Prunus mume*, had not previously been tested. Grafting of the peaches onto the *mume* rootstock was 50% successful. Even with irrigation, the heat and worst drought in the area's history played a part in the low grafting success rate. Of the ten successful grafts, one tree has produced one Tropic Snow variety peach. Other grafts of Tropic Snow and Florida Prince have produced new growth and are expected to flower next year. There was no discernable difference in fruit when this was grafted onto the *Prunus mume* rootstock. The project also tested Methley plum and Ceylon peach, both of which have fruited in Hawaii. Grafts onto Methley plum were not successful. A variety called Ceylon Peach or sometimes Mysore Peach has fruited in low elevations in Hawaii for some time. Tests of the other low-chill peaches onto the Ceylon Peach rootstock will take place when enough rootstock can be propagated. This has also been affected by ongoing drought conditions.

The project has been successful in that we were able to successfully graft some of the new low-chill peach varieties onto a no-chill rootstock and produce fruit in Hawaii. The project collaborators are very excited to continue this research for their

farms. They are working to propagate and looking to purchase more Prunus mume rootstock.

Fruits from existing trees plums were distributed to a number of chefs from the American Culinary Federation's Kona Kohala Chefs Association. This resulted in demand for the plums that exceeds current production. At one resort the chef developed a sweet tart jelly, which is on a seasonal menu enabling two growers to sell all the crop they can produce. These growers have also started to propagate more plum trees. A 19-year tree was monitored and produced 22 lbs of fruit. This was sold to a wholesaler for \$3.50 a pound (\$66.50). It took 10 minutes to harvest five pound of fruit. The tree occupied just under a 10 x 10 foot space. The plums have also been sold successfully at a farmers' markets (\$5.00 per pound) and at a local grocery at \$3.50 per pound. wholesale. The project coordinator also developed both plum jam and oriental style plum sauce using locally grown plums. In all cases the wholesalers, grocers and market customers have asked for more, showing a clear demand for much more locally grown stone fruit.

Participation Summary

Educational & Outreach Activities

PARTICIPATION SUMMARY:

Education/outreach description:

Reports on the project have been and will continue to be given at monthly West Hawaii fruit growers chapter meetings. Project photos and information have been posted on
<http://www.hawaiifruit.net/indexstonefruit.html>

Project Outcomes

Project outcomes:

Adoption and Reactions from Producers

Currently the demand for the project trees far exceeds the ability of the project coordinator and project collaborators to propagate and distribute. The collaborators have pledged to continue with the project. Two area nurseries have expressed interest in selling the Prunus mume tree as well as the grafted peach trees. For those project collaborators and the coordinators, this should be a promising business over the next few years as more rootstock becomes available.

All of the producers and collaborators of this project have expressed desire to continue monitoring their tree. They have all enjoyed samples of the fruit and wish to produce their own. It will take more time before producers have enough trees and fruit to develop marketing strategies for selling trees and fruit. There is also a waiting list for those wishing to be future stone fruit collaborators.

Recommendations:

Potential Contributions

In this part of rural Hawaii there is a clear need for much greater diversification on small family farms. Currently all stone fruit like peaches, plums and apricots are imported. This project has shown that it is possible to develop plums and better quality peaches that growers can sell at local markets or to wholesalers. As more plants are propagated and distributed, it is expected to help reduce the need for imports as well as contribute to small farm sustainability.

Future Recommendations

This type of project usually requires much more than two to three or even five years to gather acceptable scientific data. The preliminary observations showed great potential for growers and as a small niche market crops. It would be of great help to growers if tropical fruit researchers, both at the university and in federal positions, could continue to develop no-chill varieties of the Prunus genus which includes plums, peaches, cherries, apricots, almonds and nectarines. Being able to substitute these imports with locally-grown fruit would be very significant for growers and small farm sustainability in Hawaii. I would like to see Western SARE support longer-term grants for this type of horticultural research. Small amounts of farmer-rancher funding for a longer period of time would be positive and very helpful for some growers.

Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture or SARE.



This site is maintained by SARE Outreach for the SARE program and is based upon work supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, under award No. 2019-38640-29881. SARE Outreach operates under cooperative agreements with the University of Maryland to develop and disseminate information about sustainable agriculture. [USDA is an equal opportunity provider and employer.](#)