



Growing Blueberries for Home Production in Hawai'i

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What Are Blueberries?

Blueberries are native to North America, East Asia, and northern Europe. They belong to the plant family Ericaceae, which includes plants such as rhododendron, azalea, and heather. Blueberries belong to the genus *Vaccinium*, which includes cranberries and native Hawaiian 'ohelo berries. Blueberries can be grown for fun and food and as ornamentals.

A recent survey conducted by the U.S. Highbush Blueberry Council found that demand for and consumption of blueberries have increased tremendously since 2008, with consumers citing attributes such as taste, health, convenience, and versatility.

How Should Blueberries Be Grown in Hawai'i?

Typically, blueberries are grown outdoors; however, there are some major challenges to growing blueberries in Hawai'i. These challenges include feeding by certain birds, unsuitable soil conditions, and a fungal disease called blueberry rust (*Pucciniastrum vaccinii*). We have found that growing blueberries in pots under protected (greenhouse) conditions can greatly help to mitigate these problems. Growing blueberries outside in the soil is generally so challenging that most gardeners soon give it up.



Fig. 1. Blueberries can be grown successfully in Hawai'i, provided that certain conditions are present.

What Kind of Blueberries Should I Grow?

We suggest low-chill or no-chill Southern Highbush blueberry varieties. Some of the varieties that have performed fairly well from 250 to 4,000-foot elevations include 'Misty', 'Sharpblue', 'Sunshine Blue', 'Biloxi', and 'Sapphire'. See CTAHR publication F&N-12 for more information on varieties.

Pots and Media

Blueberries grow very well in containers with the right planting medium. The ideal potting mix for blueberry is acidic, with a pH ranging from 4.0 to 5.0; high in moisture-retaining organic matter; and well drained. We obtained good results using a 1:1 peat-perlite mixture. Prepared potting mixes that are available from garden shops may have been pH adjusted (limed) and therefore will be inconsistent with the acidic requirements for blueberries. We have blueberry plants that are thriving in pots ranging from 1 to 10 gallons in size. Larger-sized pots (5–10 gal) will keep larger plants from toppling over and can be productive for years with proper care. A trial is in progress to determine what pot size is best.

Fertilizer

Blueberry plants are not heavy feeders. There are many fertilizer variations, from all-natural formulations such as composts to granular fertilizers. A controlled-release fertilizer such as 13-13-13 with minor elements can be used for potted blueberry plants.

Watering

Blueberry plants are sensitive to both waterlogging and drying out. A moist but well-drained medium should be maintained. Consistent watering is highly recommended for overall plant vigor and good growth and production.

Common Blueberry Pests

The pests of blueberry that you are most likely to encounter are birds, fungal diseases such as blueberry rust

disease and botrytis blight, and the Mexican leafroller caterpillar. Keep your greenhouse secured so that birds cannot enter.

Blueberry Rust Disease: Blueberry rust is the most serious disease of blueberry plants in Hawai'i. The spores of this fungus are easily spread over long distances. In our experience, growing plants under a solid cover greatly reduces the severity of the disease. Sanitation measures such as the prompt removal of diseased leaves can significantly reduce disease pressure, especially when done early in the crop cycle.

Botrytis blight: Botrytis blight, or gray mold of blueberry, is caused by the fungal pathogen *Botrytis cinerea*. Blueberry flowers are highly susceptible to infection, and subsequently the developing fruit are infected and lost.

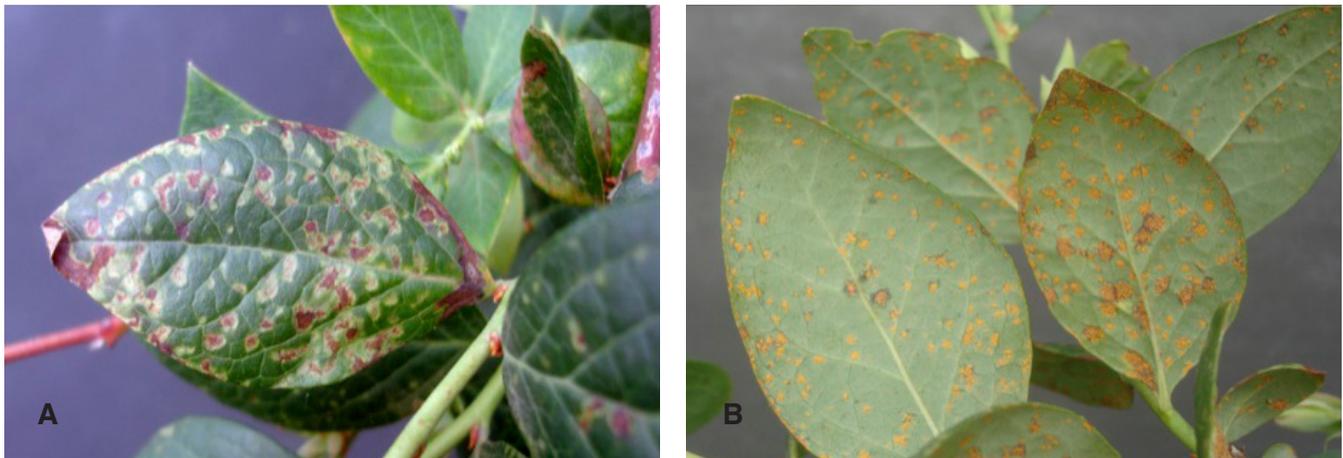


Fig. 2A. View of lesions on the upper leaf surface caused by the blueberry rust disease; 2B. View of undersides of leaves infected by the blueberry rust fungus.



Fig. 3A. Healthy blueberry flowers; 3B. Botrytis-infected flowers turning brown prematurely; 3C. Botrytis fungus forming spores on dead flowers, creating a fuzzy appearance.

Unlike the blueberry rust disease, this disease is not deterred by the covered conditions of a greenhouse; in fact, the increased humidity may even help to promote it. Cool and humid conditions are favorable for botrytis blight. Strategies for managing botrytis include sanitation, such as removal of diseased plant parts, and increasing air flow by pruning as well as increasing the distance or spacing between plants. Avoid leaving overripe berries on the plant.

Mexican Leafroller (*Amorbia emigratella* **Busck**): The caterpillar stages of this insect usually roll, feed, and pupate within the rolled young leaves on the shoot of the blueberry plant. Occasionally, flowers and fruits may also be damaged by the caterpillars. The small adult moths can often enter greenhouses and lay eggs that hatch into caterpillars. Mexican leafrollers can become established

and breed in a greenhouse containing blueberry and other suitable host plants. Newly hatched caterpillars are 1/8 inch long and reach 1 inch when fully grown.

Pruning

Blueberry plants can grow and flower all year round in Hawai'i. Pruning is done to remove dead or diseased growth, to maintain vigorous and productive stems, to open up plants for better air circulation and light penetration, and to stimulate new growth. Removal of "whips," or thin shoots near the plant base, may help to reduce the early onset of blueberry rust. After producing fruit, branches will be in need of revitalization. These older twigs should be removed or trimmed to promote new cane development. In general, plants growing in larger pots can support more canes than plants growing in smaller pots.



Fig. 4A. Young blueberry leaves that are rolled and may contain a Mexican leafroller; 4B. Caterpillar stage of the Mexican leafroller; 4C. Adult moth of the Mexican leafroller.



Fig. 5. Removing "whips" arising from the base of the plant.



Fig. 6. Example of an old twig that previously produced fruit and now needs to be removed.



Fig. 7. Harvesting blueberry fruit.



Fig. 8A. Fully ripe blueberries; 8B. “Red-backs,” or still-unripe blueberries.

Harvesting

Harvest blueberries when they are ripe. You can test them by placing your palm or a container under them and gently “tickling” them with your fingers (see Fig 7). Ripe berries (Fig. 8A) usually detach readily, though this may differ among varieties. Berries that are not fully ripe tend to be sour. These are sometimes called “red-backs” and are identifiable by a light red ring at the stem end of the fruit (Fig. 8B). Fruit should be of good quality and flavor when harvested since quality cannot be improved postharvest (Sarget et al. 2006).

Care of Berries After Harvest

Berries can be eaten fresh or can be stored in a refrigerator. Berries should be chilled as soon as possible after harvesting if they are going to be stored. As with all fresh produce, blueberries should be washed before eating.

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References

Harmon, P.F. 2014. Botrytis Blossom Blight of Southern Highbush Blueberry. Publication #PP198. University of Florida, IFAS Extension.

Hornick, M. 2014. Blueberry demand up sharply, survey finds. *The Packer*. <http://www.thepacker.com/fruit-vegetable-news/Blueberry-demand-up-sharply-survey-finds-240912681.html>

Keith, L., L. Sugiyama, A. Strauss, R. Kai, F. Zee, R. Hamasaki, M. Yamasaki, and S. Nakamoto. 2008. First report of leaf rust of blueberry caused by *Pucciniastrum vacinii* in Hawaii. *Plant Disease* 92 (11): 1590.

Mau, R.F.L., and J.L. Martin Kessing. 1992. *Amorbia emigratella* (Busck). Crop Knowledge Master. www.extento.hawaii.edu/kbase/crop/type/amorbia.htm

Sargent, S.A., J.K. Brecht, and C.F. Forney. 2006. Blueberry harvest and postharvest operations: Quality maintenance and food safety, p. 139–151. *In*: N.F. Childers and P.M. Lyrene (eds.). *Blueberries*. Childers Publications, Gainesville, FL

Zee, F., K. Hummer, W. Nishijima, R. Kai, A. Strauss, M. Yamasaki, and R.T. Hamasaki. 2006. Preliminary yields of Southern Highbush blueberry in Waimea, Hawai'i. F&N-12. University of Hawai'i at Manoa, College of Tropical Agriculture and Human Resources.