



## 'Kīlauea' and 'Red Button,' Two 'Ōhelo, *Vaccinium reticulatum*, Cultivars From Hawai'i

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### Overview

'Kīlauea' and 'Red Button' are the first ornamental-edible-berry 'ōhelo cultivars selected in Hawai'i. 'Ōhelo, *Vaccinium reticulatum* (Smith), is an endemic Hawaiian shrub, less than 1 m (3.3 ft) tall, which grows between 640 and 3700 m (2,100–12,100 ft) elevation on disturbed volcanic sites on the islands of Maui and Hawai'i. In the wild, 'ōhelo berries are most abundant during late August to September, and are gathered by local residents for processing into jam, jelly, and pie filling. Concerns have arisen about human impacts to the environment during the wild gathering of fruits that include spreading of exotic weeds, damaging native vegetation, and reducing a food source of the endemic nēnē goose, *Banta sandvicensis* (Vigor). Our objectives were to find an alternative to wild harvest of 'ōhelo, and to identify, evaluate, and select 'ōhelo cultivars for small-scale cultivation for ornamental and for edible-berry production in Hawai'i.

### Origin

In 2005, about one L (1 quart) of 'ōhelo berries was randomly collected from bearing plants in the vicinity of Kīlauea Volcano on the island of Hawai'i, and seeds were extracted, cleaned, and germinated (Zee et al. 2008). Approximately 200 seedlings were grown in pots in a nursery at the University of Hawai'i, Volcano Agricultural Research Station, Volcano, HI. Two accessions, N06-7 and N06-9, were selected in 2006. In 2008, N06-7 was named 'Kīlauea' and N06-9 was named 'Red Button.'



Fig 1. *Vaccinium reticulatum*, 'Kīlauea' plant with berries.

### Description and performance

'Kīlauea' was selected as a dual-purpose variety for ornamental and edible-berry production (Fig. 1). 'Kīlauea' has small light green leaves that have approximately a length x width of 17.2 x 12.7 mm (0.7–0.5 in) and short internodes (approximately 2.85 mm, or 0.11 in). Generally, when grown in a cool environment, such as at the University of Hawai'i, Volcano Agricultural Research Station (elevation 1,300 m or 4,265 ft), average max 20–26°C (68–79°F) and average min 2–12°C or 36–54°F), bright crimson young buds and shoots emerge at 20 to 23 days

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Fig 2. *Vaccinium reticulatum*, 'Red Button'

after trimming. Multiple flower buds are produced at the leaf axis; each floret has perfect flower structures with a fused crimson calyx and white-fringed pink corolla. The spherical young berries of 'Kīlauea' are orange to salmon color and frequently have orange spots. Mature berries measured average weight of 1.2 g, 5.5% brix and 0.67% titratable acid (TA).

'Red Button' was selected for its prolific berry production. It has ovate leaflets that are approximately 24.6 x 20.6 mm (0.97–0.81 in) in size, and internode lengths of about 3.19 mm (1.26 in) (Fig. 2). Emerging buds are bright crimson and expand into shiny, leathery green leaves with a red margin. At the Volcano Agriculture Experiment Station, 'Red Button' was observed to flower around January and February and fruit in May and June in 2010. Multiple flower buds emerge from the leaf axils and have red-purple calyx tips with a white margin. The fused sepals are dark red from budding through flowering. Berries are light orange-yellow with red speckles (Fig 2); mature berries measured 12.8 x 11.2 mm (0.5 x 0.44 in), and had 4.8% brix and 0.9% titratable acids.

For ornamental purposes, young 'ōhelo plants require frequent pinching and trimming to encourage the growth of multiple shoots and to form a compact symmetrical canopy (Zee et al. 2010). The vegetative cycle of 'ōhelo plants and their growth rate may vary in different microclimates and among genotypes. The color intensity of young 'ōhelo shoots is affected by growing temperature; for example, plants with intense red shoots when grown in the cooler temperatures of Volcano, HI, were later moved to a warmer location (21–25°C or 70–77°F) at lower elevation, where the red color darkened to maroon in about 5 days. More observations are needed to elucidate the relationship between temperature and 'ōhelo plant phenotype, which will determine the elevation/temperature ranges where ornamental properties and berry production are optimal.

From July 2009 to July 2010, berries were harvested from one-year-old 'Kīlauea' and 'Red Button' in 7.6-cm (2-gallon) pots grown at the Volcano Agricultural Research Station. The number and weight of berries harvested from three plants each were recorded weekly. 'Red Button' produced significantly more fruit than 'Kīlauea.' 'Kīlauea' averaged 15.2 g (0.53 oz) of fruit per plant per month, and a total of 182.3 g (6.43 oz) were harvested during the 12-month period. 'Red Button' was more prolific, averaging 39.6 g (1.39 oz) of fruit per plant per month, and a total of 475 g (16.76 oz) of fruit were harvested during the 12-month period. 'Kīlauea' plants were observed to have higher tolerance to powdery mildew than 'Red Button' (unpublished data).

Microsatellite or simple sequence repeat (SSR) markers of blueberry, *Vaccinium corymbosum*, were used as an additional fingerprinting tool to identify the two 'ōhelo cultivars. Each of the eight blueberry SSR markers clearly distinguished these two accessions in one-to-one comparisons and collectively can be used to validate their identity with high certainty (Bassil et al., 2010). 'Ōhelo berries are found only in Hawai'i. This study initiated the first step for long-term conservation and sustainable management of 'ōhelo germplasm for ornamental and berry production. 'Ōhelo cultivars 'Kīlauea' and 'Red Button' have potential for both berry and ornamental potted-plant production.

#### Availability

'Kīlauea' or 'Red Button' will be deposited and conserved in the public domain at the USDA/ARS, National

Plant Germplasm System (NPGS) - National Clonal Germplasm Repository (NCGR), 33447 Peoria Rd., Corvallis, OR 97333. Compositeds seeds from selected cultivated 'ōhelo plants in our collections are available in small quantities for testing. Please contact Francis Zee c/o PBARC, USDA-ARS, 64 Nowelo St., Hilo, HI 96720.

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