

Evaluating Promising New Eggplant Varieties

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Long eggplant (*Solanum melongena*) cultivars are preferred by many Hawaii's growers and consumers. Variety trials were conducted in 2008 and 2013 using a randomized complete block design with 4 reps at the Poamoho and Waimānalo Research Stations under conventional and certified organic management. Popular commercial eggplant varieties developed by CTAHR, new eggplant hybrids developed by Dr. Kenneth Takeda, retired CTAHR horticulturalist, and Susan Migita, station manager of the Poamoho Research Station, as well as varieties with superior horticultural characteristics identified by local growers were evaluated in this study.



The objective in 2008 was to identify and establish the best parental combination for CTAHR long eggplant hybrids. Fruit count, marketable yields, fruit length, fruit diameter, sheen characteristics, and horticultural characteristics were evaluated and tabulated for Hawaii #1 (Grade A) and Hawaii #2 (Grade B) products.

Varieties included in the 2008 study included: parental open pollinated lines such as 201, 204, 210 (selections from K. Takeda), Green (G), Moloka'i (MO), Nitta (N). Dark Nitta (ND, selection from Nitta by Susan Migita), Tolentino (selection from W. Tolentino), and Waimānalo Long (WAI). Hybrids included: 201 x Nitta (201 x N), Moloka'i x Nitta (MO X N), Waimānalo Long x N (WAI X N), and Waimānalo Long x Dark Nitta (ND x WAI).

Nitta is an open pollinated long eggplant cultivar discovered by an O'ahu farmer named Mr. James Nitta. Mr. Nitta gave CTAHR permission to use his variety in CTAHR's eggplant breeding program. Nitta remains a popular and productive eggplant variety used by many Hawai'i farmers. Waimānalo Long is an open pollinated cultivar developed by CTAHR. It is a hybrid between Takii Long Black and Moloka'i Long. Tolentino is a variety discovered and donated to CTAHR by Waianae farmer, Mr. Warlito Tolentino.

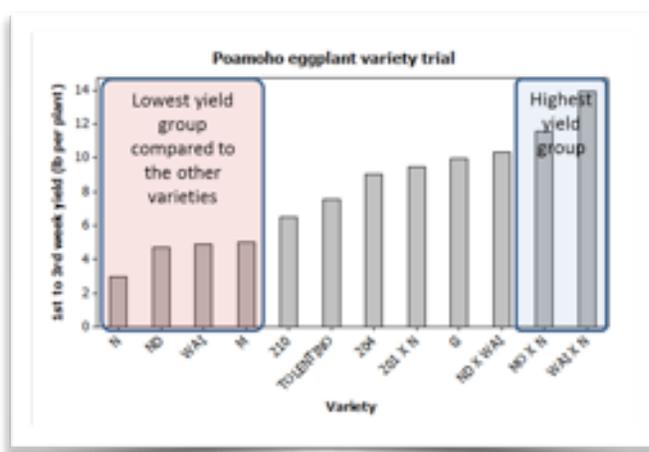


Figure 1. 2008 yield data from Poamoho trials (week 1-3).

Molokai Long is an open pollinated variety. Nitta, Waimānalo Long and Moloka'i Long are the common parental lines utilized at CTAHR today.

In 2008, Waimānalo Long x Nitta (WAI x N) and Moloka'i x Nitta (Mo X N), the current industry cultivar standards, did significantly better than the remaining 10 varieties based on total marketable yield and number of fruit/acre/week (Figure 1). Data was collected for 13 weeks. No differences were found in marketable yields among the tested varieties from week 4 on (Figure 2). All data were analyzed by ANOVA proc GLM, means were separated by pair wise Tukey comparison.

Work conducted by Takeda, Sekioka, Tanaka and Fukuda (1997) demonstrated hybrids outperformed parental varieties in total marketable yields. With the exception of 201 x Nitta, hybrids out produced all open pollinated, parental lines in regards to marketable yield, which was expected, due to the eggplant's reputation of hybrid vigor. Data confirms heterosis or hybrid vigor is exceptional in eggplants as a result of combining genetic contributions of different parental material.

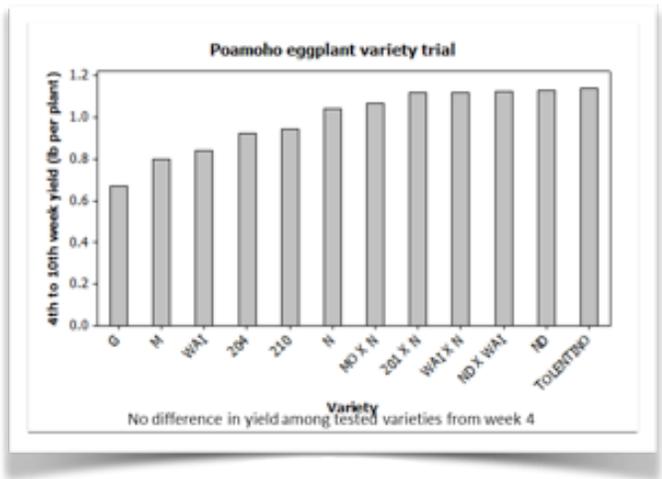


Figure 2. 2008 yield data from Poamoho trials (week 4-10).

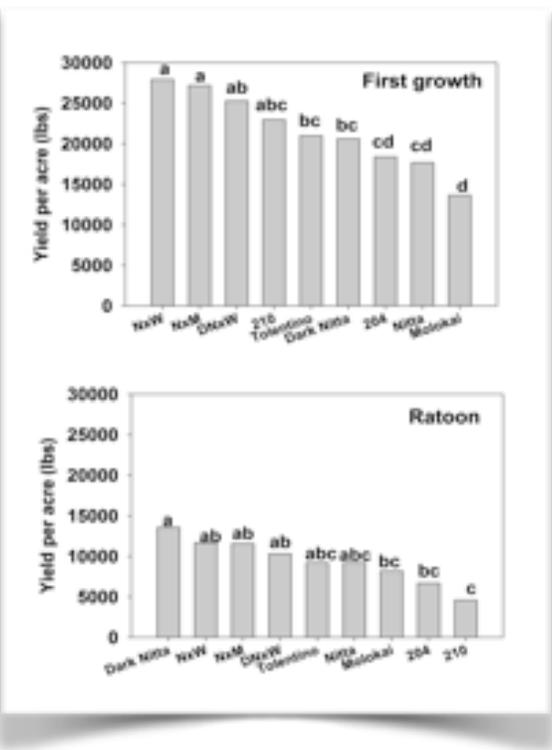


Figure 3. 2008 yield data from Waimānalo organic trials (First growth = week 1-5).

Eggplant variety trials were also conducted under organic practice at the Waimānalo Research Station in 2008. Organic field data reinforced the claim that long eggplant hybrids outperform their parents with regard to overall marketable yield (Figure 3). Quality (glossiness, straightness, etc.) was highest in new, locally bred open pollinated varieties (see: <http://www.ctahr.hawaii.edu/sustainag/news/articles/V2-Radovich-Quality.pdf>). There were significant differences between quality issues such as gloss and straightness in new varieties developed by Dr. Ken Takeda, such as 210 and 204.

Eggplant trials which focused on hybrid development was established in 2013 using a replicated block design of six eggplant varieties at the Poamoho Research Station.

Data shows there were no significant differences among the new hybrids developed by Dr. Kenneth Takeda and Susan Migita when compared against industry standards (Waimānalo x Nitta and Molokai x



Figure 4. Harvesting eggplant from Waimānalo organic plots, 2008.

Nitta). New eggplant hybrids with the most potential include: Tolentino x Nitta, 204 x Nitta, 210 x Nitta and 201 x Nitta.

The promising 201, 204, and 210 numbered cultivars were selections made by Dr. Kenneth Takeda. Hybridization or cross breeding work was conducted by Susan Migita. The 2013 field screening data shows new eggplant hybrids developed by Takeda and Migita have promise as new commercial cultivars in Hawaii. Additional field work is needed to evaluate crop production requirements, shelf life issues, and consumer preferences.

Crop breeders may one day look at creating 3-way eggplant hybrids similar to Hawaii Sweet Corn varieties to expand on the promising horticultural characteristics of long eggplant varieties at CTAHR. Program investigators are working with the ADSC Seed Lab program to make new hybrid eggplant cultivars available for sale when field trials are completed and will be looking to evaluate new hybrids on neighboring islands to assess its performance under different environmental conditions.

Literature Cited

Takeda, K., T. Sekioka, J. Tanaka, and S. Fukuda. Hort Science 32 (1): 150. 1997



Figure 5. 2013 yield data from Poamoho conventional trials indicated that yield among the hybrids was statistically similar.

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