UH CTAHR Preliminary data release of New Macadamia Varieties

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Hawaii has historically been the leader in the world for macadamia research and selecting commercial varieties. The vast majority of commercial varieties grown on Hawaii Island are selections from the initial variety trial of over 10,000 seedling trees. Varieties started to be selected in the 1930s and selection continued through the 1960s in Hawaii. The macadamia industry in South Africa and Australia started with our Aloha and sharing of Hawaiian macadamia varieties, since then, they have started their own breeding and selection programs, with the Hawaiian varieties still playing a background role. Some of the varieties selected in the 1930s are still being propagated in Hawaii today and are doing well in commercial plantings. Kakea (508) may be the most popular variety nowadays, with Kau (344) coming in a close second, unfortunately the 344 seems to be the most susceptible to Macadamia Felted Coccid (Isele, 2018.)

While no new selections of macadamia have been released from Hawaii in many years, a trial of selections chosen by Dr. Mike Nagao and planted in 2001 at the Waiakea Research Station (Waiakea) and the Kainaliu Research Station (Kona.) These selections were chosen based on their high kernel quality and tree shapes, which might make them more amenable to higher planting densities. This selection block is currently being evaluated by Dr. Alyssa Cho. Due to input from members of the Hawaii Macadamia Nut Association which wanted new commercial varieties, she began to collect data on these plots in 2015.

Using Makai (800) as a reference variety, there are two new selections that are showing promise for yield and quality. Variety 887 shows high yields at both Waiakea and Kona with average yields of 109 pounds wet in husk per tree (#WIH/tree) in Kona. Variety 900 is also showing promise for high yields at 113 pounds #WIH/tree in Kona. For reference over this time period 800 had an average yield of 85 #WIH/tree. These two varieties also show promise for kernel quality with 887 having had a nut weight of 7.5 grams (g) (making it on the small side) with a kernel weight of 3.0 g and kernel recovery of 40%. 900 had nut weight of 12 g (which is quite large) and kernel weight of 3.4 g and a kernel recovery of 28%. For reference 800 had a nut weight of 8.7g and kernel weight of 3.1g and kernel recovery of 35% (Cho,2018).


900


1cm 2 3 4 5 6
900


887

The macadamia processing industry pays its growers on how much wet in shell (WIS) nuts that are delivered. They use a fixed price per pound of WIS nuts at 20% moisture and 30% kernel recovery and will adjust the total weights according to the actual moisture and kernel recovery. For example, if a farmer was selling one acre of nuts from each of these trees at 70 trees per acre (a common density with trees spaced at 25' by 25') and using each variety's wet in husk ratio to wet in shell ratio we can figure out how much the farmer would get paid. We would also make the moisture content be the standard of 20% so that we can judge equally.

Variety	Yield WIH#/tree	#/ac WIS @70trees/A	Moisture (%)	Recovery (%)	Total lbs	Price $/#	Gross ($)
800	85	2,814	20	35	3,283	1.15	3,775
887	109	4,021	20	40	5,361	1.15	6,165
900	113	4,082	20	28	3,810	1.15	4,382

The 887 is the far and away best of the new varieties with high yield and high kernel recovery and if an acre was harvested this past year at record prices paid of $1.15/#WIS the farmer would have made $6,165 per acre. The 900 is also interesting to look at as it has the best yield, decent kernel recovery and large kernel which may sell well in the Chinese market which demands roasted nut in shell, that the consumer cracks with a little key.

The Hawaiian varieties of macadamia are usually names for places, directions or important people in the macadamia industry; for example, 800 is Makai (towards the sea), 294 is Purvis

(named for William Purvis who introduced macadamia to Hawaii) (Hamilton, 1985). If any of these new varieties are released it would be fitting if they were named "Nagao" for Mike Nagao the former macadamia researcher at UH CTAHR, and/or "Yamaguchi" for Alan Yamaguchi the retired Director of Research for Royal Hawaiian Orchards. Both of these men are well respected and their knowledge is still sought after for unusual macadamia issues.

Selecting new macadamia varieties at our own research stations is the basis for a sustainable macadamia industry in the state of Hawaii. Having control over our planting stock and having it be locally adapted and available to Hawaiian farmers helps to keep the macadamia industry thriving and competitive in the world market.

Reference:

Richard A. Hamilton, Ito P, Chia C,. Macadamia Hawaii's Desert Nut. October 1985. Cooperative Extension Service. CTAHR UH, Circular 485

Elihu Isele, personal observations, 2018

Alyssa Cho, unpublished preliminary Research, 2018. CTAHR UH