

The Macadamia Nut

Australian nut varieties studied as possible new crop for California

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Nut cluster of *Macadamia ternifolia*.

A test collection of macadamia nut varieties—10 from Hawaii and five from Australia, the native home of the nut—is under study for evaluation as a commercial crop for California.

The macadamia is a subtropical which exhibits approximately the same frost tolerance as the Fuerte avocado. It is adapted to a rather wide range of soil conditions. Because of its high resistance—or possible complete immunity—to attack by the avocado root rot organism, *Phytophthora cinnamomi*, the macadamia nut might be a suitable replacement crop for avocado orchards that have been rendered valueless by this disease.

The two major objectives of the macadamia varietal study are yield and fruit quality. The primary factors of fruit quality, which have been considered and evaluated, are nut size, shell thickness as reflected by crack-out percentage, and oil content. Nut size may prove to be not too important but must be considered. In California, nuts from some trees average over 1 1/8" in diameter, but unfortunately these large nuts frequently have relatively thick shells and small kernels. The medium-sized nuts sometimes are more desirable in that they may have relatively thinner shells and frequently rather large kernels.

The macadamia nut contains an unusually high amount of oil—up to 65% and 70%—hence is comparable in this respect to the pecan, Brazil nut, and other high oil-bearing nuts. Nuts with low oil content have good eating quality but do not store well and do not retain their quality in commercial processing. Therefore, considerable value is given to those nuts with high oil content.

The following data represent samples taken from some of the more promising macadamia seedling trees in southern California:

Clone	Average shell dia. (inch)	Nuts per pound	% kernel	% oil
O-N	1 1/16	48	31.2	67.8
O-W	1	73	29.5	56.1
F	7/8	73	33.0	69.3
H-R	7/8	98	36.0	62.5
T-4	7/8	82	37.0	72.6
A	15/16	65	25.4	66.6

The majority of the seedling trees that have been grown in California are of the

Macadamia ternifolia type. These are characterized by leaves that have prickles on their margin and by the fact that the trees have a short, distinct period of bloom; hence the rough-shelled nuts mature during a short period in the fall. A few seedling trees in California and the majority of the Hawaiian selections are of the *M. integrifolia* type, which has smooth leaf margins and which blooms and matures smooth-shelled nuts almost continuously throughout the year. The behavior of these two rather distinct horticultural seedling races is being observed in the present survey. The ternifolia type—apparently—is considerably less subject to chlorosis in several areas where it has been observed. Investigators in Hawaii have noted that certain clones are more susceptible to the development of chlorosis, regardless of rootstock.

Propagation of the macadamia has been under investigation for several years but no success in budding has been attained to date. Grafting of older trees in the field has been successful, however. Grafting of nursery stock by whip or tongue and groove grafts has been a satisfactory method of propagation. The best results from these propagation experiments have been obtained during the winter months, using the dormant hardwood as scions. It has been thought that the use of rooted cuttings of the various clones would be a desirable and eco-

nomical method to propagate the varieties. The investigations during the past five years have indicated that tip cuttings of rather hard wood are easily rooted. Several trees propagated by this method have been set in the field alongside standard grafted plants to compare the behavior of trees propagated by these two methods.

The tendency toward alternate bearing of seedling trees in California is indicated by the yields from three *M. ternifolia* trees, in the University orchard at Los Angeles, as shown in the table.

A field survey in southern California has disclosed several individual macadamia trees of bearing age, some of which are magnificent specimens of large proportions, with heights of 40' to 45' and diameters of 18" or more. One tree, about 50 years old, has been observed for several years to produce crops of 125 pounds of husked nuts in alternate years.

The potentialities of the macadamia as a nut with commercial value were realized about 30 years ago when a program of research and testing was begun by the Hawaiian Agricultural Experiment Station.

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The California Avocado Society is co-operating in the study referred to in the above brief progress report.

Yield in Pounds of Nuts

	1943	1944-45	1946	1947	1948	1949	1950	1951	1952
Trees 19	2.8	no data	19.3	1.3	9.8	1.5	24.8	23.3	11.0
Trees 21	1.7	no data	20.6	0.2	22.2	5.6	24.2	19.0	24.0
Trees 23	17.8	no data	29.9	23.3	31.8	5.3	18.0	44.0	14.0

Smooth shell form of macadamia nut shown on left. Rough shell form on right.

