

## THE CATE MACADAMIA

A. Clark Warren & Joseph A. Vicari

In 1962, 12.93 acres were purchased on W. Lilac Road about 1.8 miles east of U. S. Highway 395. In the Spring of 1963 the upper portion was planted to 502 macadamia trees of the following varieties:

VARIETY	NO. OF TREES	VARIETY	NO. OF TREES
Arcia	11	Ikaika	42
Burdick #2	24	Pahau (425)	61
Cate #2	6	Wailua (475)	12
J-3	7	HAES 491	27
Westree Hybrid #5	6	Kakea (508)	15
Westree Hybrid #11	31	Grove Farm #1 (621)	65
Keauhou (246)	195		

The trees were purchased from the Westree Nursery. At the time, no producing plantings of any size were known in the area so no valid recommendations could be made as to variety. Mr. Nelson Westree suggested that we plant a selection of varieties, as shown above, with major emphasis on the Hawaiian varieties and selections which were known to perform well in areas closer to the coast. These would be observed from year to year and accurate records kept to determine which variety was best suited to our location, which is approximately 17 miles inland from the coast at about 1,000 feet elevation.

It soon became apparent that some varieties were not suited to the area and a program was initiated to top work these varieties to others that would hopefully be better suited. In the Spring of 1965, we arranged to have Paul Thomson graft over 11 Arcia trees to Jordan (HAES 462), as the Arcia was found to have too thick a shell. Later on these same trees had Elimbah grafted on them as we thought it would prove to be a better bearer and more precocious than the Jordan. One tree each of Beaumont, HAES 764, and Stephenson were purchased and planted for trial. One tree was grafted to Beaumont on one side and to a seedling tetraphylla selection from UCLA on the other. This tree was selected by Paul Thomson in 1961 as the best from a large group of seedlings on the UCLA campus. In all, a total of 17 varieties have been fruited here in our attempts to discover a variety that would be suited to our location.

From the harvest of nuts in 1966, samples were sent to Paul Thomson for testing to determine their weight, percentage of kernel to shell (crackout %), and oil content. Nut kernels were graded as to oil percentage with Grade I having 72% or more oil, Grade II 68%, and Grade III below

68% and classified as culls. The Hawaiian varieties were very disappointing in their test results. At our inland location and relatively high elevation it was found that the shell thickness greatly increased, with a corresponding decrease in kernel size. This did not come as a complete surprise to us as a similar trend had been observed earlier in the Dwight Heinz grove located in Pala Loma, a location not too far from ours having nearly the same climate and soil. Kernel size, quality and crackout % were all unacceptably low for all the Hawaiian varieties except HAES 491. Kernel size was too small in HAES 491, but quality was 100% Grade I, and Crackout was 38.3%. These results are shown in Figure 1.

COMPOSITE RESULTS OF TESTS MADE BY PAUL H. THOMSON  
1967 to 1969 (3 Tests)

Variety	Nuts /lb	Avg. Ker. Wgt./Grs.	Crackout %	Grade I(%)	Grade II(%)	Grade III(%)	Color	Consistency	Flavor	Size	Shell	Shape	Remarks
Cate #2	62	2.70	40.6	35	55	10	Cream	Crisp	Good	Large	Thin	Round	Very Good Producer
Beaumont	82	1.93	35.0	20	40	40	Cream	Fairly Crisp	Good	Small	Fairly Thin	Round	90% Sticktight
Burdick	40	3.55	31.0	20	40	40	Cream	Not Very Crisp	Good	Very Large	Thick	Spindle	Good Producer
Keauhou (246)	70	1.75	27.0	40	35	25	Cream	Crisp	Good	Var.	Thick	Round	Poor Producer
Ikaika (333)	74	1.46	23.5	50	40	10	Dark Cream	Fairly Crisp	Good	Small	Thick	Round	Poor Producer
Kakea (508)	70	1.80	28.0	55	40	5	Cream	Crisp	Poor	Small	Thick	Round	Poor Producer
HAES 490	110	1.57	38.3	100			White	Very Crisp	Good	Small	Thin	Round	Fair Producer
W-11	59	2.35	30.8	30	60	10	Cream	Crisp	Good	Var.	Fairly Thick	Fairly Round	Good Producer

Figure 1

In 1970, we decided that Thomson's test results should be verified by a different person. Nuts were harvested and a "grab bag" sample of four varieties were labeled 1, 2, 3, 4 and sent to Dr. William B. Storey, at the University of California at Riverside, for testing. As can be seen in Figure 2 the results, though not identical, were very close to those previously obtained. (We also made tests ourselves with practically the same results.)

We were now ready to reach a decision as to which variety should be used to top work our trees. W-11 looked very good, so in the Spring of 1969,

306 trees were grafted to it. We liked the Cate very much but it was thought perhaps kernel quality might not be acceptable. So hesitantly we turned to W-11.

RESULTS OF TESTS MADE BY DR. WILLIAM B. STOREY

1970

Variety	Avg. Ker. Wgt./Grs.	Crackout %	Grade I(%)	Flavor	Size	Remarks
Cate #2	3.0	40	50	Good	Large	No Adverse Comments
Keauhou (246)	1.6	28	36			Small
Ikaika (333)	1.5	24	28			
W-11	2.3	31	36			Sticks Very Tight

Figure 2

Several factors influenced our final decision, among which wind resistance and upright growth were very important. We found both W-11 and Cate to be very wind resistant while most of the integrifolia varieties were highly susceptible to wind damage. In addition we had to spend a lot of money for labor to keep the trees pruned high enough to allow the sprinklers to distribute the water evenly under them. W-11 was particularly willowy in this respect and kept drooping to the ground, requiring an excessive amount of pruning. Finally, after much soul searching, we decided that of all the varieties we had, only Cate came close to our ideal.

Of the 17 varieties tested, Cate is the only one with sufficient good qualities, together with an absence of undesirable characteristics, to be worthy of further propagation at our inland location, elevation approximately 1,000 feet above sea level. Herewith are the reasons influencing our decision.

1. It is precocious, producing fruit at a very early age.
2. It is prolific, bearing an acceptable product in great abundance as compared to other varieties. (After changing fertilizers we found the quality of the kernel greatly improved.)
3. It has shown no tendency toward alternate bearing, having produced consistently a larger and larger volume as shown in Figure 3 year

alter year without interruption.

4. Cate #2 is the only nut that has been produced at Rancho Macadamia that has provided an "acceptable" crackout percentage (approximately 40%), without any objectionable qualities such as "stick-tight" kernels like the Jordon, variability of size like Elimbah and Beaumont, or excessive kernel shrinkage in the early drops as in the Burdick.
5. Approximately 90% of the nuts fall from the tree free of their husks. The remaining 10% are very simply husked by a flip of the fingers during harvest; thus leaving the husks as mulch under the tree, if desired, and eliminating a time-consuming and costly husking operation.
6. The tree drops its fruit within a comparatively short time. The greatest harvest is in late October just in time for processing for the Fall fireside and Christmas season, no doubt the best season of the year for the sale of in-shell nuts to consumers. The short harvest season of about two months requires much less labor than the extended season of both the integrifolias and the hybrids.
7. Cate has been found to be our most wind resistant variety. It has suffered only minor wind damage in our windy area, as compared to some of our integrifolias, which have been reduced by wind to only a five inch diameter branchless stump. The reason for its wind resistance seems to be that its foliage is not as dense as the integrifolias, so the wind can go through it. The branches are strong and upright and do not bend with a heavy load of nuts.
8. Being a tetraphylla, the Cate grows upward, rather than drooping like the integrifolias. Consequently, it does not constantly require "skirting" to permit the irrigation water to surround the tree. Once it is pruned to the desired height it tends to stay at that height and requires no further "skirting".
9. Cate is considered to be the most beautiful variety at Rancho Macadamia. Though it grows upward, it is not sparse or "straggly" like the Burdick. It fills out to form a much more symmetrical tree. Its red new growth adds a touch of beauty.

In the Spring of 1970, all trees were grafted to Cate and now nearly all the trees at Rancho Macadamia have healthy, new red growth showing amid the green. In a few more years we are certain that our decision will prove to have been a sound one.

We do not necessarily recommend Cate for all orchards. We simply present, for your evaluation, the facts and figures of its performance at our inland location and elevation.



COMPARATIVE PRODUCTION OF MACADAMIA VARIETIES

Tree No.	Variety	1st Yr. (Lbs.)	2nd Yr. (Lbs.)	3rd Yr. (Lbs.)	4th Yr. (Lbs.)	5th Yr. (Lbs.)	6th Yr. (Lbs.)	7th Yr. (Lbs.)
1	Cate #2	.1	.3	1.0	2.8	12.4	19.8	27.7
2	Cate #2	.1	.1	.9	2.4	9.8	20.1	25.2
3	Cate #2	.2	.2	1.2	3.4	13.2	17.4	34.2
4	Cate #2	.2	.5	1.9	4.1	17.1	18.3	32.0
5	Cate #2	.1	.1	.8	2.2	8.9	13.9	24.9
6	Cate #2	.1	.6	1.2	6.7	22.9	19.7	37.8
7	Beaumont	.0	.6	8.4	10.4	—	—	—
8	Burdick	.0	.3	.7	1.3	3.2	21.1	26.2
9	246	.0	.0	.0	.6	5.1	1.9	9.5
10	333	.0	.0	.0	.2	4.5	3.5	6.5
11	508	.0	.0	.0	.3	4.2	1.7	5.7
12	W-11	.0	.0	.1	.3	3.4	14.2	21.5

Figure 3



Warren (L) and Vicari  
beneath  
Cate #2 Macadamia Planted  
May 1963 Rancho Macadamia



Vicari showing a cluster of  
nuts on Cate #2 Macadamia.

NOTE: Cate #2 was mentioned on page 13 of the 1958 yearbook of the California Macadamia Society. In an article by Dr. W. B. Storey titled "The Macadamia Variety Situation in California" it was one of nineteen varieties out of over three hundred specimen trees that had "been earmarked for further observation.

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