



A young tree of macadamia (*Macadamia integrifolia*), rooted from the tree on Coronado Island, San Diego. Author's photograph



Macadamia nuts ready to eat. Photograph by RGT



An inflorescence and ripening fruit on macadamia (*Macadamia integrifolia*). Photograph by Matt Ritter

Orchard Trees of Rancho Los Cerritos: Macadamia

MARIE BARNIDGE-McINTYRE

Landscape architect Ralph Cornell added only two kinds of nut trees to Llewellyn and Avis Bixby's Rancho Los Cerritos estate: pecan and macadamia. Only the macadamias were

planted in the primary orchard. Macadamias were considered a treat reserved for gardeners in coastal communities until the 1940s, when World War II saw hundreds of thousands of

service men and women stationed or stopping over in Hawaii. Once exposed to the flavorful nut, they returned to their distant homes with a demand for the nuts that helped launch an island industry; Hawaii would soon lead the world in macadamia production, until Australia took the lead in 1997.

Native to the Australian rainforests of Queensland and northern New South Wales, macadamias thrive with the regular water, good drainage, and protection from frost and wind provided by their unique habitat. The Aborigines would travel great distances to arrive at the eastern slopes of the Great Dividing Range from March through June to feast on these rich nuts.

Although Allan Cunningham is listed as discovering the tree in 1828, chemist John Macadam grew them in 1857 and showed the plants to a botanist friend, Baron Ferdinand von Mueller, who described and named it *Macadamia ternifolia*. Europeans initially thought the nuts to be toxic, but, in 1858, the superintendent of the Brisbane City Botanical Gardens noted a boy eating them with no ill effects. The tree was under cultivation almost immediately and imported to both the Sandwich Islands and California at about the same time. Professor Dwinelle at UC Berkeley planted several nuts he had obtained from Australia at the Strawberry Creek entrance of the young campus around 1879.

Between 1859 and 1897, a second species of macadamia was recognized and described as *Macadamia integrifolia*. For some reason, growers largely ignored this designation, and all trees continued to be listed as *M. ternifolia*, as was a third introduced species (*M. tetraphylla*).

In 1888, the Hotel del Coronado was under construction on Coronado Island in San Diego. When the "Del" was complete, the fellow who oversaw the planting built himself a lovely Victorian home and landscaped it with surplus materials, including a macadamia tree.

Another old California macadamia of record came by mail order from Florida to Mr Faulkner, a farmer in Santa Paula, at the turn of the century. Primarily a grower of citrus and walnuts, Faulkner was curious about the macadamia. His single seed grew to ten feet and had

been bearing nuts for a couple of years when the great freeze of 1913 killed it to the ground. This freeze was a noteworthy event for California's agriculturists. For two weeks, the days were filled with rain while, at night, temperatures dropped into the teens. Entire groves of citrus were lost. That this particular macadamia recovered, sprouting multiple trunks and withstanding subsequent, albeit lighter freezes, made this tree something of a novelty. Faulkner welcomed the hundreds of botanists, professional and amateur, who came to study the tree, perhaps hoping that it could be used to hybridize a frost-resistant macadamia.

The macadamias planted up and down the state had been grown from seeds, as cuttings *always* failed to root. Frost tender, variable in quality, and producing the hardest husk of any commercial nut, the macadamia came to be viewed as a risky investment for farmers.

Macadamias were doing better in Hawaii, and both the Government Board of Agriculture and Forestry and the Hawaii Agricultural Growing Station pursued how best to turn macadamias into a commercial venture. The first commercial orchard was planted in 1922, once again with seedlings.

A Chance Breakthrough

In 1926, a high school boy was hired as a student employee at the Agricultural Experiment Station, where he was taught plant identification and propagation. In the spirit of youthful enthusiasm, he decided to try grafting macadamias, certain that he could make it work where others had failed. He too met with complete failure. But his employer brought in a broken macadamia branch and asked that he take scions from it to graft onto seedlings.

Young Ralph Moltzau thought this a "ridiculous request" and ignored it. His boss noticed the neglected branch two days later and firmly reiterated his request. Ralph agreed to apply himself to a hasty grafting job, placed the results in the greenhouse "to await certain death," and promptly put them out of his mind.

Needing to make room in the greenhouse three weeks later, Moltzau thought to dump the



dead macadamias, only to discover that two had buds opening on the grafts. This was the first time a macadamia had been successfully grafted, proving wrong all those horticulturists who said it could not be done.

In that same year, Hawaii passed legislation exempting all lands used solely for macadamia culture from taxation for five years. Three years later, the horticulturist of the agricultural station published a paper on the cultivation of macadamia; a second paper was published jointly with Moltzau. Until these publications, only Hawaii had the key to grafting macadamias, and they made excellent use of that knowledge.

In 1928, the University of Hawaii hired Ralph D Cornell as their supervising landscape architect. At this same time, Moltzau, after attending the University of Washington, returned to Hawaii to work for the Hawaiian Macadamia Nut Company. Moltzau enrolled at the University of Hawaii to have access to their labs for special problems. Whether or not Moltzau and Cornell met, Cornell had a prime seat to observe the macadamia industry burgeon in the tropical islands.

Three years later while designing Rancho Los Cerritos, the estate garden of Llewellyn and Avis Bixby in Long Beach, Cornell included two macadamia trees in their primary orchard. They did not make it through the intervening years and both were slated for replacement during the Rancho's orchard restoration in 2001. Thus began my quest for macadamias.

A Quest

Cornell's plan simply stated "Macadamia," so it was unclear which species of macadamia Cornell had planted. All the catalogs of the day listed the originally assigned name, *Macadamia ternifolia*. So it should have been simple to replace the trees. Not so. It turns out that the majority of nuts shipped worldwide had been incorrectly identified. In fact, the intervening years revealed ten new species! Fortunately only two species produce edible nuts.

These two species had a few key identifying characteristics, most notably the smooth shell of *Macadamia integrifolia* and the rough shell of *M. tetraphylla*. No historic photos offered a

close-up view of the fruit, so I plunged into the history books to ferret out which nut the local nurseries might have been distributing. Thank heavens for the California Macadamia Society who directed me to *M. integrifolia*.

As you might imagine, once Hawaii shared the grafting secret with the world, everybody got into the act. Whole orchards were cut down to graft selected favorites onto the established rootstock. Getting a good quality tree, historic to the period of the orchard's initial planting, was more challenging because of this extreme proliferation of cultivated forms of the tree.

Tracking down records of those earliest macadamias in California, I found they were all *Macadamia integrifolia*. Now all I had to do was find out if they survived, and request permission to propagate from them.

The Faulkner Farm, planted in the early twentieth century in Santa Paula, was still intact; the family had turned it over to the UC Hanson Trust. The Trust was aware that their macadamia was old and agreed to let me take cuttings.

The Rancho plans called for two trees. Since Cornell's orchard plan exuded diversity in all of the species planted, I pushed for scion wood from the nineteenth-century Coronado tree as well. This was a bigger challenge, as it was on private property, and the owner was unknown. I wrote a letter, addressed to "Dear Resident," regarding their historic macadamia tree and sent it off with a stamp and prayer to the 1888 address.

The fellow who received it pitched it into the discard pile, thinking it was a plea for money. But the peculiar address led him to retrieve it from the discards. He opened it and read the letter explaining my quest.

His parents had bought the property from the daughter of the original owner, restored the house, and enjoyed the macadamias. He was intrigued by my request. Retired from the Navy, where he'd been stationed in Long Beach, he remembered Rancho Los Cerritos fondly. Now I had two sources, and all I had to do was get cuttings.

Grafting for Success

The reason grafting had not been successful, early on, was the irregular structure of the

plant's circulation tissue. For most plants, all of the circulation is held within the thin layer of meristematic tissue called "bark." Moisture and nutrients absorbed by the root system move up, and the complex carbohydrates manufactured during photosynthesis flow down. Within that narrow band of tissue runs the life-blood of the tree.

The macadamia's system, however, has the supply routes separated. Moisture and nutrients run up the center of the woody structure, while the tissue carrying complex carbohydrates down remains in the bark region.

Mottzau's graft had been successful because he had allowed the branch to sit for a couple of days. Separated from the tree, the sugars and starches were effectively locked into the future cuttings. Those stored starches allowed the scion to accept the grafting process.

The recommended procedure for macadamias, now, is to make an initial girdling cut on the scion wood in winter, then wait from six weeks to three months to sever the connection with the parent tree. I scheduled the girdling, or first cut, for mid-December; once I saw the trees, I was glad to be getting this project underway, as neither tree was in good condition. According to the recommended schedule,

the cuttings would be retrieved between early February and the end of March. Every target day I identified in February to liberate the cuttings was washed out due to rains. The first week of March had me gritting my teeth and donning rain gear to get those cuttings. I dropped the precious cargo off in Vista at Cooper's Nuts, a wholesale grower that had agreed to graft them for the Rancho. Now they were out of my hands, and I waited while the grafting process worked its magic. Fortunately, it did, and we received one tree from each source location.

Planted twenty feet apart, the Santa Paula tree has grown to twice the size of the Coronado tree, but both have flowered and fruited. Macadamias are considered the hardest nut to crack, but no one told the squirrels that have invaded the neighborhood, so we have yet to harvest any edible nuts for the Rancho.

Of all the "lost" trees replanted in the Rancho's orchard, these cuttings from California trees have a documented history of their own. Should the parent trees succumb in time, as they are likely to do, it will be the Rancho's turn to reciprocate, keeping history alive and growing, not only for our site, but for other historic sites as well. 🌱




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