

## Avocados in Australia

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Attendance at the Australasian Fruit and Nut Tree Conference at Lismore, New South Wales, Australia, August 14-19, 1988, provided an opportunity to visit with several avocado growers in Queensland and New South Wales, and later in the Perth area of Western Australia. These three regions provide the major avocado production in Australia. Cairns, Queensland, is located on the northeast coast at south latitude 17°. The Atherton Tableland one thousand feet above nearby Cairns is the northeast center of avocado production for Queensland. Here, the earliest fruits are provided for the Brisbane and Sydney markets. Reed, Fuerte, Zutano, Pinkerton, and Hazzard are the cultivars of major importance. Hass is slowly disappearing as the fruit fails to develop adequate size in this area. The Shepard variety, which is not satisfactory in other areas, has shown good yields of fine quality fruit in this particular area. Among the several problems which limit high quality fruit in some instances are severe attacks by the stinging bug, which causes external cracks in the fruit skin and internal galls just beneath the skin. Hail damage and the resulting pocking of the fruit surface, occasional attack by fruit flies of several sorts, and the development of anthracnose blemishes may limit the fruit quality to some extent. The frequent exposure to high humidity conditions sometimes results in *Dothiorella* fruit spots and ring neck in the fruit stem. Ring neck is of variable appearance which has been associated with nutritional problems in some instances.

One of the major problems throughout the avocado industry in the Queensland area has been the development of fruit quality standards, which can effectively improve the marketability of fruit at least in the major outlets in the larger Australian markets. Most of the fruits produced by the larger volume growers are packed on the premises in small packing facilities usually operated by the grower and a few hired hands. Quality separation is "by eye" according to acceptable government suggested standards. Elimination of obviously poor fruit is the practice, but selection of first and second quality fruits is highly variable between individual packing sheds. Some growers are lax in separation of second quality fruit, which causes "first grade" labeled fruits to carry more blemishes, insect infestations, and less oil content than might be desirable for a good consistent marketing practice. The more recent trend toward the packing of fruits by several growers through a common, large packing facility appears to lessen the tendency for poor quality fruit to enter the trade under the "first class" label.

Several larger packers and group packing houses are developing recognized trade labels on their packages, which should cause an overall improvement in fruit quality in the market place. Consumers have voiced their disappointment at poor quality fruit at the retail level. Thus, many of the larger growers have taken warning and are attempting

to direct the industry as a whole to take more care in the provision of high quality fruit.

There is apparently little effort made to utilize second quality fruit and obvious unfit fruit in the form of products and byproducts. Some second quality fruits with blemishes are sold occasionally in the lower class markets. A few attempts have been made to develop products such as guacamole dips and by-products such as oil and cosmetic ingredients. The resulting products have been less than successful in most instances. Possibly tons of fruit discarded because of insect stings and hail damage are merely dumped onto some orchards as a mulch.

A major loss of crop in some instances, and the reduction of fruit quality in avocado areas of New South Wales around Brisbane, is the effect of hail storms, which are generally experienced annually to some extent. An unusual storm in February, 1988, devastated many avocado orchards by excessive rains. Records of 172 inches of rain during a period of three weeks did not drain rapidly, causing the soils to remain at field capacity and above for the period. This resulted in the asphyxiation and collapse of many old trees and some young trees in poorly drained soils. Some trees were removed completely as soon as possible after the soil had drained. Many large trees with trunk diameters of 12-15 inches were "dehorned" to a height of 4 to 5 feet and the trunks painted white. Surprisingly, many of the dehorned trees began to re-sprout in August, 1988. These possibly can be retrained into productive trees again.

Among the insect pests, twig borers cause a considerable loss of fruiting branches laden with fruits and the breakage of other vegetative branches.

While the industry has planted asexually propagated clonal resistant rootstocks, there has been a reconsideration by many growers of classical seedling rootstocks, such as Topa Topa, Mexicola, and others as commercially productive rootstocks. This reevaluation of productivity of the seedling stocks has been suggested in light of root rot control by phosphorous acid injection. Several field observations have indicated that seedling stock can result in yields equal to, or sometimes better than, clonal stocks. Indexed virus-free trees for sources of stock and scion are assumed in these observations and conclusions.

A major development in the Australian avocado industry has been the enforcement of new plant patent laws which require accounting for distribution and propagation of registered plant materials in respect to identity and royalty remuneration. These new laws should result in the introduction and control of new cultivars, particularly from California, with appropriate compensation and royalties. The lack of adequate legal protection for patented plant materials in the past has been a limitation of developments in several horticultural industries in Australia.

A small avocado industry has been developing in Western Australia, near Perth. The area of Waneroo, about 50 miles northeast of Perth, is characterized by a mild climate and very light textured soils. More than 10,000 avocado trees have been established in this area during the past 14 years. Hass, Fuerte, Pinkerton, and Sharwill are the major varieties now in production. The entire crop is marketed in Perth. Fuerte is slowly decreasing in importance as Sharwill becomes more widely planted. Problems of soil salinity, and the limited availability of water in some instances, have curtailed expansion of the industry in this area. Approximately 50 miles south of Perth is Baldivis, where

12,000 avocado trees have been planted to supplement the Perth market. The remainder of 3000 trees in other areas near Perth, together with Baldivis and Waneroo, comprise the present major portion of current avocado production in Western Australia. A relatively new area under consideration for avocado expansion is that of Pemberton, located about 25 miles inland from the Indian Ocean about 60 miles north of Albany. While the lighter textured soils of this inland hilly area have problems with salinity, some four year old orchards of Hass are growing well with favorable crops. Several other trial plantings of Hass and other varieties, such as Sharwill, have been made. There appears to be considerable potential for avocado production in this area which, like the Perth area, is relatively free of insect pests—especially the stinging bug and fruit fly, and where *Phytophthora* root rot is not yet a major problem. Proximity to the potentially good Perth market is also a favorable factor in the development of the area for avocado production.

A person interested in avocados would be concerned with botanical relatives which are found in the native flora of the east coast of Australia. There are several rainforest species of the genus *Endlandra* which are related botanically in the family Lauraceae. The large, fleshy fruits of some species up to 2½ or 3 inches in diameter might be mistaken for a wild avocado. Attempts are under way to introduce into California some of these species for research purposes, as they possibly could provide a potential rootstock or could be utilized in breeding studies of the cultivated avocado.

A botanical specimen of special interest was noted in the Botanical Garden at Sydney. A fine tree of *Persea nanmu*, the "nanmu" of western China, is about 60 feet in height, with a trunk diameter of 18 inches at the base. This species is reported to provide a special type of wood for use in temples and for coffins. Fruit was not seen on the Sydney specimen. This species could possibly be of value in our horticultural investigations in California.