Macadamia Nut Prodction in Hawaii

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Introduction

The macadamia nut was introduced into Hawaii over 100 years ago. It was brought from Australia where it is indigenous to the coastal rain forest areas of southern Queensland and northern New South Wales. This nut is the only Australian plant to attain the staus of a commercial food crop.

Two species that produce edible kernels are *Macadamia integrifolia* and *Macadamia tetraphylla*. The former is the only commercially important species, commonly known as "smooth shell" macadamia. The latter, *Macadamia tetraphylla*, also known as "rough shell" is grown in some areas. There are many trees that are hybrid between the two species but no important clonal selection of hybrid origin have been found for Hawaii.

The macadamia industry is relatively small, producing over 20,000 metric tons of in shell nuts in 1982. Hawaii produces an estimated 80 percent of the world production and Australia about 15 percent. Other countries producing macadamia are Costa Rica, Guatemala, Kenya, Malawi and South Africa.

Cultivars

Many cultivars have been described from Australia, California, Hawaii and South Africa. The first five cultivars named in Hawaii were released in 1948 with eight more clones being named in subsequent years. Of these thirteen cultivars, seven are presently being recommended for orchard planting in the state. They are Purvis (294), Kau (344), Kakea (508), Keaau (660), Mauka (741), Pahala (788) and Makai (800). These cultivars were all developed by the University of Hawaii plant breeders.

Older orchards were predominently planted with Keauhou (246), Ikaika (333) and Kakea (508) but newer orchards are being planted with the new cultivars, especially with Kau, a more upright type tree. Kau is a productive cultivar that appears to be well adapted to varying elevations up to 2,000 feet.

Cultural Methods

Both species of macadamia have been used for rootstock but the trend is towards using 'smooth shell' since they have a better root system. Scionwood must be girdled at least 6 weeks in advance to assure a successful graft. Side wedge graft is commonly used in Hawaii but other types of grafts are equally successful.

Although macadamias survive mild frosts and drought conditions, yield and quality are adversely affected and supplemental irrigation must be provided during the dry season, especially before flowering and during nut development. Temperatures over 90°F appear to reduce production and growth.

Macadamias can be grown in various soil types with exceptionally good drainage. The soil pH should be maintained slightly above 5.5. In most areas a complete fertilizer with a ratio of 1:1:1 of nitrogen, phosphorus and potassium have given good results. Soil tests and leaf analysis of nutrient elements should be used as a guide for fertilization.

Harvesting and Processing

The harvesting season for macadamias is from August to April, with peak months being October and November. Depending on cultivars, Kakea has a prolonged harvest season of 9 months while Kau, Keaau and

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Mauka have comparatively short harvest season of 4 months. Macadamia nuts naturally fall to the ground when mature and should be collected before they begin to germinate or turn rancid.

Husks of macadamias should be removed within 24 hours after harvest to prevent development of off-flavors. The husked nuts should be dried in a forced air dryer for 3 days at 100°F and finally at 125°F to bring the kernel moisture to 1½ percent. These dried nuts are then cracked and the kernels roasted in coconut oil for 10-12 minutes at 275°F, or dry roasted in a forced air oven.

Research

The macadamia industry in Hawaii is a classic example where basic research has paid great dividends. Solution of problems through research resolved unsurmountable obstacles and developed a viable industry.

At present, research areas include expansion of markets and improved processing techniques. The use of ethrel to facilitate shake harvesting and better equipment to harvest nuts. The problems of soil and plant nutrition are ongoing research, as is the development of new cultivars. Concern for tree decline, spacing and thinning have prompted research in those areas. Water requirements as well as orchard ground covers are being studied. Pollination, nut development and nut drop are other areas being studied.

The Hawaii Macadamia Producers' Association has aided research by providing grants and, together with the Hawaii Agricultural Experiment Station, has worked to direct its research efforts in a more meaningful and productive manner. Research efforts are encouraged to meet the competitive changing situation to keep the status of macadamia as the world's finest dessert nut.

Literature Cited

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