Nut crops

Department of Agriculture, Western Australia
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PECANS

The pecan originated in the United States of America, where a thriving industry has developed for this popular confectionery nut.

Its fruit is similar to that of the walnut. In fact it is regarded as a more hardy variant of the walnut with a broader spectrum of adaptability to climate and soil type.

Pecan industries also have been established in Israel, South Africa, and Australia where commercial plantings have been developed in Queensland and northern New South Wales. One such plantation, of 70,000 pecan trees, covers 750 hectares.

Commercial potential

A number of relatively small commercial plantings of pecans have been established in Western Australia. It is evident already that the trees do well in the State's South-West, given fertile soil and summer irrigation.

The oldest of these plantings yields 30 kilograms per tree from 15 year old trees.

There is a growing market for "in-shell" pecan nuts throughout Australia, though the potential is difficult to assess.

Taking into account that pecans take up to 20 years to reach peak production, and allowing for substantial investment before this level of cropping can be reached, it is doubtful if plantings of less than 20 hectares are likely to be economic, other than for small part-time enterprises.

Growth details

The pecan (Carya illinoensis) is a large, leafy deciduous tree, 10 to 17 metres tall.

It is monoecious, that is, male and female flowers form on different parts of the tree. Female flowers are produced from the current spring growth, and male flowers on last season's wood. Because the flowers are wind pollinated, pecans require dry conditions during flowering for effective fruit setting.

Owing to the delay between pollen release and receptivity of the female flower, some pecan varieties require pollinator trees of other varieties planted within rows on a grid system.

The nuts take 180 to 210 days to mature.

Pecans are adaptable to a range of soil types; most prefer deep fertile well drained soils and good supplies of moisture through summer.
CHESTNUTS

Chestnuts have become popular in Western Australia only recently. Yet chestnut trees were probably introduced by the first European settlers. There are records of a planting at Bridgetown in 1862.

The sweet, floury flesh of a roasted chestnut is a delicacy many Western Australians have yet to try, but if more recent plantings are successful the demand for this nutritious nut could increase steadily.

Commercial potential

About 2000 kilograms of chestnuts were sold at the Perth markets at prices of up to $8.00/kg in the first half of 1983. Some growers already have established a significant "pick your own" trade in areas where chestnuts are growing well.

There is scope for expanding local and export markets, particularly for large, good quality nuts.

Commercial exploitation will be limited by ink disease Phytophthora cinnamomi, the same organism which causes "jarrah dieback". Because of their high moisture and starch content, chestnuts are very perishable. They do not store well for long periods at room temperature, but can be kept longer if cooled and treated to prevent fungal rots. Controlled atmosphere storage can preserve the nuts for longer periods and retain their eating quality.

Growth details

Most chestnuts grown in Western Australia are of the European or Spanish variety (Castanea sativa). Other species—Japanese (C. crenata), Chinese (C. mollissima) and American (C. dentata)—have been planted, but in smaller numbers.

Chestnuts are long-lived deciduous trees which may grow 30 metres tall, with a 20 metre canopy width. Each plant has separate male and female flowers, but the female flowers must be cross-pollinated from another variety. Trees flower in December, and are wind pollinated. Fertilised female flowers form spiny burrs, each containing three developing nuts, not all of which mature. The burr usually falls with the mature nut still enclosed.

For best results, chestnuts should be grafted or budded using known superior varieties on rootstock seedlings grown from nuts of the same varieties. Western Australian nurserymen can supply named, budded or grafted varieties.

Chestnuts thrive best on deep, well drained, fertile soils, and require moist soil conditions through summer for best growth.

Chestnuts tend to bear heavy and light crops in alternate years, but a well grown mature tree can yield more than 250 kilograms of nuts in a heavy bearing year in Western Australia.
PISTACHIOS

Pistachio nuts are now available in many Western Australian shops, and are gaining popularity in spite of their relatively high price.

The species originated in Asia and Asia Minor. For centuries, pistachios have been cultivated in Iran, Turkey, Greece, Syria, Lebanon, Italy, Sicily, India, Afghanistan, Pakistan and Tunisia.

Pistachios were introduced into the United States of America more than a century ago, to become a commercial crop in California where about 1200 hectares had been planted by 1980.

Commercial potential

In Australia, the demand for pistachio nuts is still far greater than the supply, but too little information is available yet to assess the crop’s potential in Western Australia.

Mature pistachio trees can produce more than 50 kilograms of nuts in shell per tree. They can produce in five to seven years. Some can take as long as 15 years, though trees planted 12 years ago in South Australia are yielding up to 35 kilograms of nuts per tree.

Pistachios planted experimentally at the Department of Agriculture’s Stoneville Research Station in 1980 are growing well. Commercial plantings have been made near Moora and Gingin.

As with similar crops, the costs of establishing pistachios are high.

Growth details

The pistachio (Pistacia vera L.) is a deciduous tree growing to 10 metres tall.

Flowers are wind pollinated, and male and female flowers are produced on separate plants. Cross pollination is required for fruit setting.

Pistachios grown in suitable conditions can live for hundreds of years.

The trees require winter chilling, and long hot summers with low humidity.

They require a good depth of well drained top-soil. Although they are drought tolerant, they perform best commercially if irrigated during dry periods.

WALNUTS

Walnuts have always had a place on the Western Australian table, particularly at Christmas. Today, they are being used increasingly in many other foods.

In 1981/82, Western Australia imported about 95 tonnes of walnuts in the shell, and 260 tonnes of kernels.

Western Australia still has no big commercial plantings, although productive trees have been grown here for more than a century.

Commercial potential

A major obstacle to commercial walnut production is that walnut orchards can take up to 20 years to yield enough nuts to pay for their establishment and run at a profit. This means that potential producers must be able to cover the establishment and growing costs and withstand the loss of income from the planted area for this period.

Mature walnut grove at Manjimup.
Another problem in the south-west of Western Australia… the area most suited to walnuts… is walnut blight disease, which is difficult to control under favourable weather conditions. Some of the varieties introduced from overseas have been selected for their blight resistance and might prove suitable for Western Australia’s wetter areas.

In Western Australia a mature tree can yield up to 50 kilograms of walnuts. In the United States of America yields range from 2.5 to 10 tonnes per hectare, considerably higher than present Australian yields, indicating that better results could be achieved.

**Growth details**

Walnuts are the fruits of the “Persian walnut” (Juglans regia) which is also known as the English or European walnut. It is a long-lived deciduous tree, up to 15 metres tall and sometimes more than 25 metres across the canopy. It has separate male and female flowers, which are wind-pollinated. Growers usually plant a number of different varieties together to ensure pollination because male pollen shedding on individual trees sometimes does not coincide with female flower opening.

The fruit is fleshy green, carrying a large seed which later becomes the walnut. As the nut reaches maturity, the fruit dries up and releases the nut.

Seedling trees produce variable quality nuts. Known superior varieties are grafted onto root stocks of Persian walnut, Californian black walnut (J. hindsii) or black walnut (J. nigra).

Irrigation is essential for walnut establishment and for high yields.

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**CASHEWS**

Cashew nuts have become a luxury in the confectionery trade throughout Australia. They are native to central America and Brazil. The early Spanish and Portuguese explorers took them to other tropical regions, so they are now well established in India, Africa, Malaysia, and Indonesia.

Cashews have been grown successfully in home gardens and mission stations in the Kimberley for many years, and trial plantings have been established at the Department of Agriculture's research stations in the North-West and the Kimberley.

**Commercial potential**

The Western Australian Government has invited potential developers to test the commercial potential of cashews in northern Western Australia on a pilot farm basis. This follows indications that the crop could have good prospects in the tropical North. However, it would not be suitable for the South-West of the State because it requires a monsoonal, tropical climate.

If a major cashew venture is to be viable, plantations would have to be big enough to justify the expensive plant and machinery needed to process the nut.
Little of the cashew is wasted. The “apple” can be eaten fresh or used in jams and pickles. The shell surrounding the nut has a honeycomb structure containing a valuable oil used in the manufacture of corrosion-resistant paints, varnishes and resins.

**Growth details**
The cashew (Anacardium occidentale L.) is an evergreen tree up to 12 metres tall, which can spread to 20 metres across.

It grows rapidly, and can flower and produce fruit in its second year. The flowers are carried on terminal panicles, as are mangoes, to which cashews are related.

The nut is carried in a shell which develops on the end of an enlarged spongy fruit—the “apple”—which can vary from yellow to red.

**MACADAMIAS**
Shelled macadamia nuts, plain or salted, are now available throughout Australia, usually at prices exceeding those of all other nuts—a tribute to their flavour and texture.

They originated in the rain forests of northern New South Wales and southern Queensland, the only Australian nuts to be developed commercially.

A number of trees, produced from nuts imported from Queensland, have been growing and bearing under irrigation on the Department of Agriculture’s Gascoyne Research Station in Carnarvon for more than 30 years. Some have been planted since then in other districts and in Perth suburban gardens.

**Commercial potential**
An industry has developed in New South Wales and Queensland, but it will take some time for horticulturists to assess the potential of macadamia varieties suitable for Western Australian conditions.

They are slow to produce, which makes them less attractive than many other horticultural crops. Trees do not yield commercial crops until their sixth year, and do not reach full maturity until their 20th year.

**Growth details**
The two edible species of macadamia (Macadamia integrifolia and M. tetraphylla) are evergreen trees up to 10 metres tall and 12 metres across the canopy. Their individual leaves are reminiscent of the banksia but their foliage is much denser.

Flowers are carried inside the canopy on stems up to 30 centimetres long. These flowers are either male or female. The nuts form in clusters, each with a hard brown shell, surrounded by an outer green husk. Inside the shell is a white to cream kernel one to two centimetres in diameter. The kernel has an oil content of 70 to 75 per cent.

Although macadamias originated in sub-tropical conditions, the trees will produce commercial crops of nuts in areas of low relative humidity. Irrigation is required in dry areas, and the young trees need protection from strong winds.