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Kiwifruit

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Kiwifruit is a comparatively new arrival on the fruit markets of the western world. It is native to Southwestern China and, although it was introduced to Europe, the USA, and New Zealand at the beginning of this century, it has only been traded internationally since the mid 1950's.

The kiwifruit (*Actinidia deliciosa* (A. Chev.) C. F. Liang et A. R. Ferguson) is a vine and fruit are borne on laterals that are produced from 1-year-old shoots or canes. Cane renewal is carried out during winter pruning while pruning in summer is used to maintain order in the vines by removing unwanted and tangled growth.

Vines, grown from grafted scions on seedling rootstocks or from rooted cuttings, are trained on many different structures but the most commonly used are the T-bar fence and the pergola. In common with many other horticultural tree and vine crops, a myriad of alternative structures are being evaluated currently, including modifications of the main growing systems and variations such as V, Y and A-shaped structures.

It is a warm-temperature deciduous species that has a distinct winter dormant phase. Winter chilling is required to ensure adequate budbreak of fruitful laterals in spring. Dormant vines will tolerate mild frosts without injury but, under New Zealand conditions, temperatures below -12°C are lethal. Flowers and young growth in spring are intolerant of frost. Fertilizer and irrigation requirements are typical of those for similar orchard crops but shelter from wind is essential to avoid vine and fruit damage.

Kiwifruit is dioecious. Production throughout the world is based almost solely on one pistillate cultivar: 'Hayward.' Some others including 'Bruno,' Abbott' and 'Monty,' together with local selections, are grown but their importance is minor. The main staminate cultivars, which are interplanted in the orchard to supply pollen at flowering time, are 'Matua' and 'Tomuri.' This range of cultivars is likely to increase as current breeding and selection programmes identify more-precocious pistillate selections with a range of different fruit types, and identify staminate selections with improved pollen production and longer flowering periods.

The success of this fruit is probably attributable to a number of factors. One of the most important is its internal appearance. Cut transversely, the fruit has a creamy-white central core and a brilliant green outer flesh. Light coloured bands radiate through the green flesh and small, brown-black seeds surround the core in the spaces between these rays. The skin, which is brown in color, and covered with easily-removed hairs, can be eaten but is usually peeled off before the rest of the fruit is consumed. The fruit is very high in vitamin C content (80-120 mg/100 g) and has a pleasant, mild flavour. Fruit are harvested while they are still firm and can be cool-stored for long periods. Ripening is stimulated by ethylene.

Kiwifruit was first introduced into Western horticulture at the turn of the century. The origin of 'Hayward' can be traced back to the importation of seed from a Scottish Mission in China to New Zealand in 1904. Nurserymen in New Zealand actively promoted its use in home gardens and were quick to recognize the need for male and

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female plants to be planted together to ensure fruit production. The first small-scale commercial orchards were planted in the 1930s but it was not until 1952 that the first fruit was exported.

Hayward' was named after an early New Zealand nurseryman H. R. (Hayward) Wright who selected the strain originally. The cultivar 'Bruno' was named after another early nurseryman B. H. (Bruno) Just while 'Allison' which was raised by Just, was named after Alexander Allison who probably grew the first kiwifruit plants in New Zealand.

Ironically seed of kiwifruit was sent to the USA in the same year that seed was sent to New Zealand (1904). Plants were established at the Plant Introduction Station at Chico, California and these grew successfully and had their first flowers in 1907—unfortunately they were all staminate or male plants. Pistillate plants were imported from nurserymen in England in 1913 but in spite of widespread trials no commercial orchards were established at that time. Hayward Wright sent seed to Chico in 1935 and plants were successfully established from that introduction. 'Chico' or 'Chico Hayward' was derived from that source. However although this material was established and maintained at the station it was not promoted and remained overlooked until 25 years later when the first orchards were established in California in the early 1960's.

Much of the commercial development of kiwifruit, including the selection and naming of cultivars, the development of training, pruning and storage methods, the setting of packaging and grading standands, and the promotion of the fruit to consumers around the world was, until very recently, carried out solely by the New Zealand-based industry. In 1986, the area of land planted in this crop in New Zealand was approximately 17,000 ha and the export volume was approximately 47 m trays (175,000 tonnes).

Although more than half of the volume of fruit presently traded internationally comes from New Zealand the crop is now grown commercially in many countries in both the northern and southern hemispheres including the USA (mainly California), France, Italy, Greece, Spain, Japan, Australia, southern Africa, and Chile. By 1990, the total world production of kiwifruit will be about 500,000 tonnes of which about 60 percent will be produced in New Zealand.

The kiwifruit is becoming more widely known and accepted by consumers around the world and it is now regularly traded in many fresh fruit markets. It is likely that new cultivars will soon be developed that reduce the total reliance on 'Hayward.' It is also obvious that current research will develop our knowledge and lead to improvements in the management and handling of this crop both during production and after harvest. The range of processed products available will no doubt be extended as the total volume of fruit produced around the world increases. In particular kiwifruit production in China will increase and other Actinidia species, with their centres of origin in that country, are likely to be introduced and be developed to become more important in Western horticulture.

General References

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