

Quote: . . . the industry has adapted to the pressure to be first with new varieties by extremely rapid orchard turnover.

The New Zealand Apple Industry

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New Zealand is a relative newcomer to the world apple scene, with most of their growth taking place in the past 25 years. In that time, New Zealand production has tripled to over 20 million cartons/year. Recently the World Apple Report newsletter rated New Zealand as the best place on earth to grow apples. Is it true? In this article, we describe some of the factors by which New Zealand lays claim to such a title.

New Zealand accounts for about one-third of the southern hemisphere crop and about 1% of world production. Production occurs in four regions (Figure 1). The Nelson region on the south island and Hawke's Bay on the north island are the traditional areas for apple production. Nelson accounts for almost a third of New Zealand's production. Hawke's Bay is the region which has grown most in recent years and now accounts for nearly 50% of national production.

Surrounded by ocean, New Zealand's climate is moderate and pleasant. Cool nights during the growing season lessen the loss of carbohydrates to nighttime respiration, leaving more available for both fruit growth and flower development. Short, mild winters mean that the trees are never subjected to winter injury and even allow the apple grower to raise oranges in the home garden.

The principal growing districts, Hawke's Bay and Nelson, are both located in the rain shadow of mountain ranges. Both regions are blessed with abundant sunshine, although yields in Hawke's Bay tend to be higher—as much as 2500 boxes per acre. This is mainly due to the flat, fertile alluvial soils in Hawke's Bay, in contrast to the clay soils and mostly rolling hills in Nelson. Because of the heavier soils, MM.106 rootstock cannot be used in Nelson as it is in Hawke's Bay—the more disease-tolerant and vigorous Merton 793 being preferred instead. Production in Hawke's Bay has grown by about 25% over the past 10 years, compared to a 4% increase in Nelson.

Light levels, particularly late in the season, are significantly higher than occur in the United States. The long growing season leaves an extended period of time following harvest for continued growth and flower development. The unstressed trees make the most of the high light intensity and long growing season, yielding huge crops with marketable size and great return bloom.

Lack of elevation does create some concern for blossom damage, due to spring frosts, but the mild maritime climate lessens this risk. Many New Zealand orchards are equipped with wind machines, or can hire helicopters, which usually are enough to prevent injury due to radiation frosts. Hail is a major threat to New Zealand orchards, accounting for major losses to fresh market exports in 1994 and 1996.

The average size of a New Zealand orchard enterprise is small, on the order of 19 acres/grower, allowing for intensive management practices to be employed. The cost of good orchard land is

expensive (\$15,000 NZ/acre; currently 2\$ NZ equals 1\$ US), so intensive management is required to justify the investment. Since rainfall can be infrequent during the summer months, irrigation is normally used in New Zealand orchards. Figure 2 summarizes New Zealand's apple advantages and gives the authors' ratings of the relative importance of each factor.

There are still a few orchards in New Zealand that are 20 to 30 years old and trained to the traditional multi-leader system. However, the great majority of trees are younger and are trained to the slender pyramid. This system has become predominant due to the need for greater precocity from semi-dwarfs and the need for better light penetration to obtain color as growers switched from Granny to red varieties. This system utilizes many of the same techniques as vertical axe: no heading at planting, limb spreading and pruning to create a canopy with many smaller and weaker lateral branches, and a more dominant leader than traditional central leader trees. Often a single-wire trellis is used with the wire at 5 or 6 feet from the ground. A well-managed slender pyramid orchard presents a "saw-tooth" appearance when viewed from the side, as the tops of the tall, narrow canopies are separated with narrow, open slots to increase light penetration, while the lower half of the canopy space is filled in the traditional "hedgerow" style. This system allows the grower to make maximum use of the vertical space in the orchard while reducing the amount of shading that usually takes place with tall trees.

Orchards are usually planted at distances of 10 x 17 feet on MM.106 rootstocks. The rootstock is an important first line of defense against woolly apple aphid (WAA) and provides the New Zealand grower with excellent growth, precocity, and survival in most orchard soils. With most varieties a partial crop is obtained in the third leaf on MM.106.

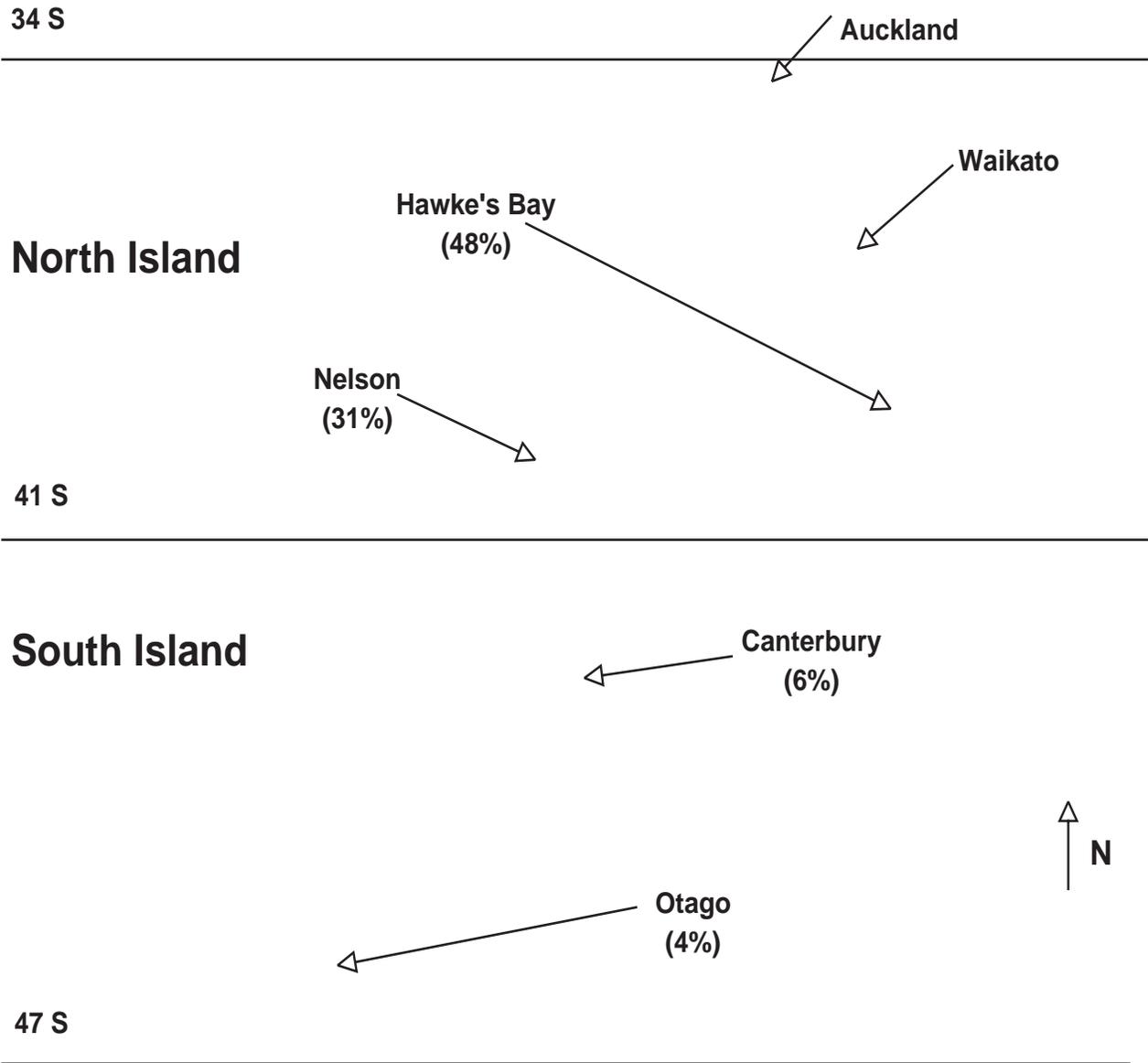
There is interest in rootstocks with more dwarfing, and some growers are experimenting with Mark, M.9, or M.26, but the lack of WAA resistance is a concern. New Zealand growers face problems with excessive vigor and fruit size in some orchards. Excessive fruit size, poor fruit color and internal quality are principal concerns with Fuji. Growers are trying root pruning, trunk girdling and grassed plots as techniques of controlling Fuji tree vigor and fruit size.

Variety selection is dynamic. Historically New Zealand grew fruit for England: Cox's Orange Pippin, Delicious and Golden Delicious. Then along came Granny Smith. Granny was a terrific apple for New Zealand conditions; it thrived in the long season and mild climate, producing yields as high as 3000 boxes per acre on multi-leader trees (actually a good system for a fruit that is down-graded for blush). Granny held up well on the long boat ride to market and provided a fresh green breath of spring in the storage apple market of the northern hemisphere winter. Like all good things, however, other growers took notice and soon competition from not only other southern hemisphere regions, but also southern Europe and the US west coast began to swell the volume of Granny Smith available year-round. Prices declined, and the New Zealanders began to look for alternatives to make more money. Ten years ago Granny was No. 1 in New Zealand, by 1996 it has declined to 9% of their production. First Gala, then Royal Gala took center stage, but this time the response from world competition was swift and production came up more rapidly than before. Next New Zealand planted Braeburn, with the world snapping at their heels. The New Zealand industry has noticed, naturally, that the profitable introductory phase has gotten shorter and shorter with each new cultivar they introduce and they have responded to the pressure in two ways.

First, the industry has adapted to the pressure to be first with new varieties by extremely rapid orchard turnover. Most growers spend as little time growing “commodity” apples as possible. When a variety graduates from its introductory phase to become an established variety on the market, they begin to replace it with newer ones. In 1995, following one year of disappointing returns for Braeburn, growers began topworking 1-, 2-, and 3-year-old Braeburn trees to new, sometimes unnamed, varieties. If the planting is young and the vigor and spacing are balanced, the block may be topworked, otherwise the trees are removed and the block is replanted.

The other way that New Zealand is trying to manage the introduction of new varieties is trademarking the name. Unlike a plant patent, a trademark is forever. Anyone wishing to sell apples by that name must obtain the permission of the owner. By controlling the volume of a new variety that can be sold, New Zealand hopes to extend the time for which their industry can receive a premium price for having assumed the risks and paying the promotional costs associated with introducing a new variety.

Figure 1. New Zealand apple growing regions (percent production).



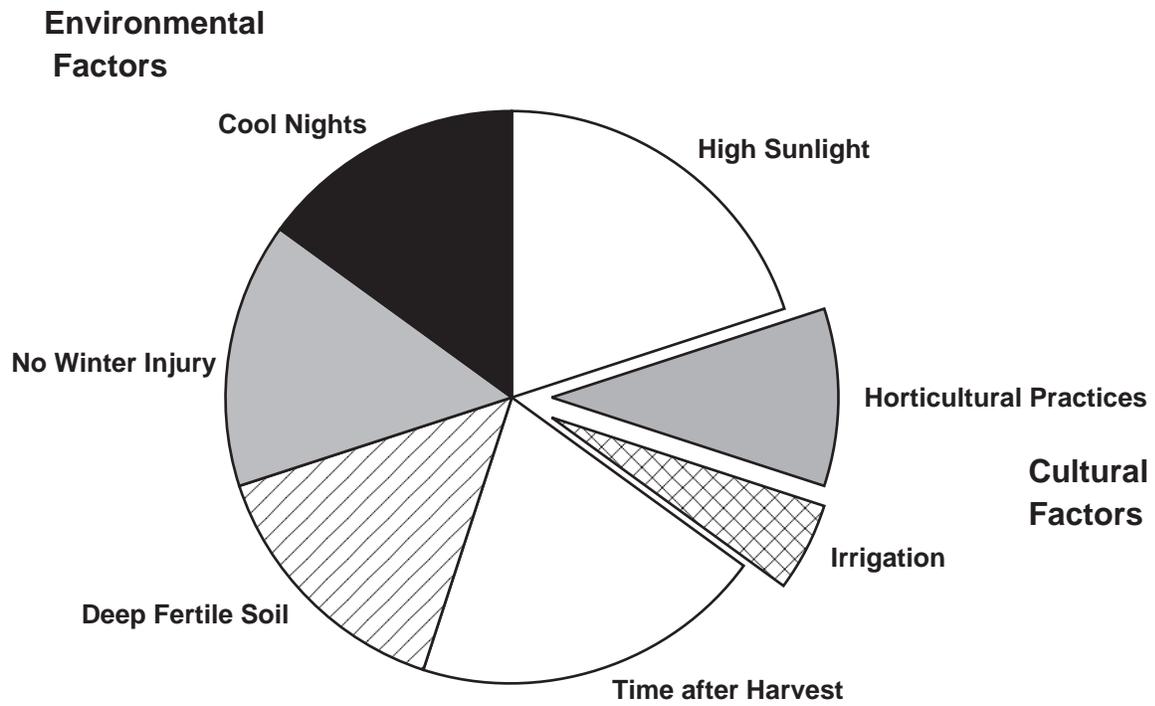


Figure 2. Environmental and cultural factors concerned with New Zealand apples.