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The New Zealand Avocado Industry

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New Zealand is a comparatively small country consisting of two major islands lying approximately between latitudes 34°S and 48°S, and surrounded by a vast area of ocean, with the Pacific Ocean to the east and the Tasman Sea to the west. The nearest land mass of significance is Australia which is 1900 km west. This geographical situation gives New Zealand an equable insular climate, with no great extremes of temperature in either summer or winter.

TABLE 1

AVERAGE METEOROLOGICAL DATA—TAURANGA

Month	Rainfall mm	Sunshine Hours	Mean Temperatures C Max	Min	Av	Days Ground Frost	Days Screen Frost
January	90	250	23.5	13.5	18.5	0.3	—
February	89	209	24.0	14.0	19.0	0.2	—
March	108	203	22.5	12.7	17.5	0.6	—
April	125	178	20.0	10.2	15.0	2.4	—
May	125	157	17.0	7.8	12.5	7.0	0.4
June	142	139	14.7	5.5	10.0	11.5	2.2
July	127	149	14.2	4.6	9.4	14.0	3.0
August	122	163	14.8	5.5	10.0	11.7	1.2
September	97	183	16.4	6.8	11.5	9.0	0.2
October	117	202	18.0	8.8	12.8	4.0	—
November	84	225	20.2	10.4	15.2	1.6	—
December	86	240	22.0	12.0	17.0	0.5	—

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The northern part of the North Island is the only part of the country where avocados could be considered on a significant scale because of the climate, although odd situations further south may have a suitable local microclimate.

Meteorological data for Tauranga in the Bay of Plenty which is the main area where avocados will be grown, is shown in Table 1.

Plantings of avocados in New Zealand in 1980 amount to no more than 250 hectares, which is small by world standards, but expansion is continuing to take place. The majority of plantings are in the Bay of Plenty, and the only other area of any significance is Poverty Bay.

New Zealand has several major advantages in growing avocados:

a. **Soil:** The yellow brown loams of the Bay of Plenty derived from volcanic ash are deep and naturally free draining, but still have a reasonable moisture holding capacity. Waterlogging, and associated problems from *Phytophthora* root rot are rare in this district. The soils are naturally mildly acid, and in practice it is easy to maintain a soil pH around 6.0 - 6.5.

b. **Rainfall:** A reasonable annual precipitation that is well distributed throughout the year means that irrigation is not a necessity, even if it is installed as a luxury.

c. **Sunshine:** The moderate strength of the sunshine allows much of the fruit that sets outside the foliage canopy to be harvested as top grade fruit rather than be lost through sun scorch.

d. **Temperature:** The moderate temperatures allow fruit of the Hass variety to size to excellent proportions.

On the other hand, there are some disadvantages that New Zealand has to contend with and minimise in its efforts to produce avocados:

a. **Temperature:** The major marginal factor is the comparatively low spring temperatures at the time of flowering and fruit set. Light frosts, rather than big freezes, are frequently encountered during the winter; but these are not too serious if the right growing sites are selected.

b. **Wind:** New Zealand having an insular climate experiences a significant amount of wind, which can be a problem in getting optimum plant growth and performance. The wind dissipates the heat in the or chards, accentuating the marginal situation with spring temperatures unless suitable shelter belt systems are provided.

To overcome these two major factors it is important that only the best orchard sites are selected, lying well to the sun, and that they can be well sheltered to hold the warmth, especially in the flowering period. All management practices must also be geared to making the most of every degree of warmth at that vital time.

There are many varieties of avocado in New Zealand, but like most other producing countries a narrow range of better varieties is recommended for commercial orchards. Currently the following varieties are recommended:

Zutano	July-August
Fuerte	Mid August-October
Hayes	Mid October-December
Hass	Mid November-March
Reed	February-April

Hass is the most important of these varieties and constitutes about 50% of the trees in commercial avocado orchards in New Zealand.

Fuerte is an unreliable cropper, as it appears to be in many other parts of the world; but the new variety Hayes fills the gap before Hass comes into season. Hayes was bred in Hawaii, by Professor Dick Hamilton, and being a late flowering variety is doing well under New Zealand conditions, as late spring temperatures are much less marginal. The fruit has many characteristics of Hass, one of its parents, such as a thick, pebbled skin that goes a dark purple brown colour on attaining maturity. The fruit however, besides being earlier to mature than Hass, tends to be larger and somewhat shinier in appearance. The tree habit is upright with somewhat pendulous branches and laterals. The fruit tends to be carried more within the foliage canopy than Hass.

Reed, another late flowering variety of good quality, appears to have a definite place here in the late season.

Pollination is of course vital, and especially so under the somewhat low spring temperatures experienced in New Zealand. For this reason, late flowering varieties are likely to give an advantage as they flower as temperatures are significantly rising.

The temperatures in a New Zealand spring are also quite variable, as a consequence of the insular climate. The very rigid A and B flowering pattern found in warmer countries is not very rigid here, and it is not uncommon to find both male and female flowers open on the same tree at one time. It is possible that this situation leads to a lesser dependence on cross pollination.

Bees work avocados prolifically, and it is believed they play an important part in pollination; but this has not yet been checked out under New Zealand conditions.

A leaf analysis survey has been under way for three years. Using information from overseas where research on avocado nutrition has been carried out it appears generally that nitrogen levels are too high, whilst zinc and boron levels could be low. Improved tree performance could be expected from correcting this situation.

New Zealand is indeed fortunate in the disease status of avocados. *Phytophthora* is not a major issue on the deep, free-draining volcanic soils, although it is on heavier, shallower soils. Sunblotch has never been recorded in New Zealand, and an indexing programme started during 1980 has already shown that several thousand trees are free of this viroid disease. The vast majority of trees propagated from now on will be utilizing seed and scions from parent trees known to be free of Sunblotch.

Fungal spotting of mature fruit in the orchard is very largely confined to Zutano and

Fuerte, both minor varieties with thin skins maturing during the wetter months of July and August.

On the pest scene, a range of pests is present, the most important being caterpillars, whilst scale, mealy bug, and thrips can also be present.

To date, the avocado has been an almost unknown fruit in New Zealand; and there is considerable scope for developing the New Zealand domestic market, whilst at the same time being aware of export opportunities, particularly for the good sized high quality Hass that can be produced here.