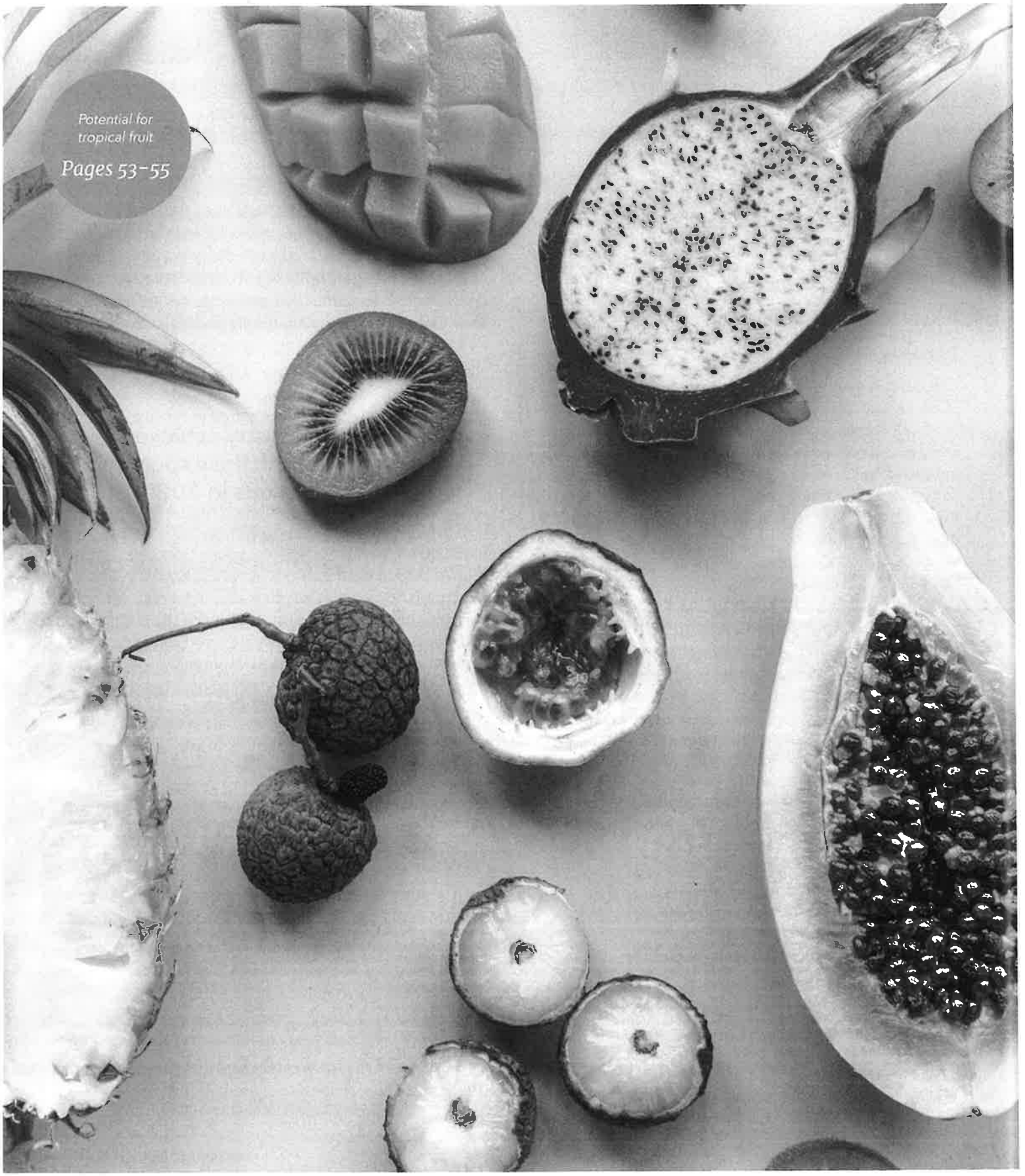
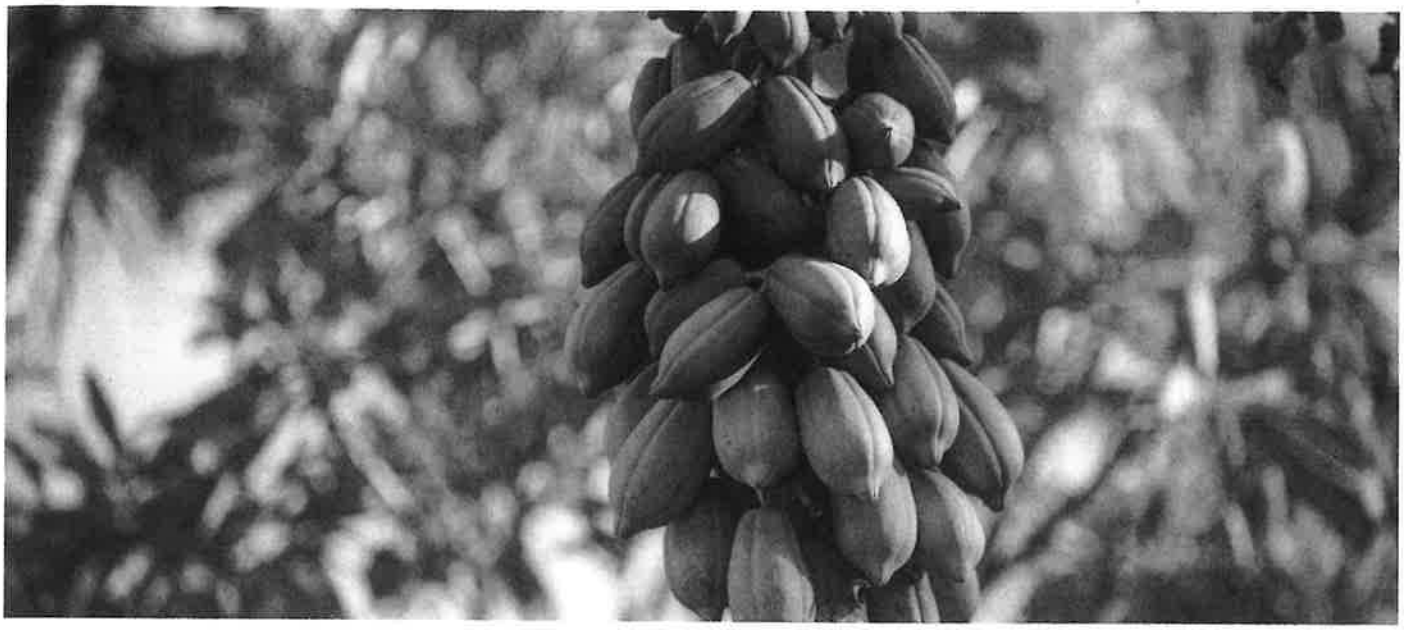
organisms

TECHNICAL

THE LATEST INNOVATIONS AND IMPROVEMENTS



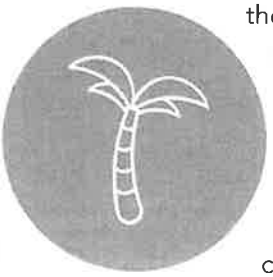


Tropical fruit crops

There is little doubt that global warming is going to result in the warmer areas of New Zealand being able to seriously consider the economics of producing some of the tropical fruits we occasionally import or enjoy when overseas.

By Mike Nichols

There is already an increasing interest in the growing of banana (see Nichols, 2021), and this will result in more interest in other tropical fruits such as pineapple, mango, papaya, lychee and perhaps even such 'exotic' tropical fruits as rambutan, longan, mangosteen, and perhaps even durian. There are of course, sound biosecurity reasons for limiting the importation of exotic fruits (for example fruit fly).



Over the past 50 years there has been ongoing interest in the potential of growing tropical fruits in New Zealand. These have been directed at the selection of areas where the microclimate was more suitable. With the development of relatively cheap plastic greenhouses, and the advent of global warming, the prospects of developing a tropical fruit industry for the domestic market are enhanced.

The downside is that to produce these crops effectively will require some form of protected cropping (greenhouses) and in some cases supplementary heating.

There is a looming shortage of electricity in New Zealand for the future, particularly as we move rapidly away from carbon dominated energy sources. With the bulk of the population in the North Island, and Manapouri sourced electricity for the foreseeable future committed to the

Mango being grown under cover in the Canary Islands

aluminium smelter, there is an urgent need for more environmentally friendly electrical generation in the North Island. Of course, New Zealand has an advantage over many temperate countries, and that is access to geothermal energy.

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The new development by Contact Energy of the Tauhara geothermal power project near Taupō, with its Geothermal Energy Park, may well provide this opportunity. However, heating does not have to be geothermally based, in fact in the Netherlands growers are looking at the possibility of sourcing heating from only a few hundred metres below the soil surface, as the temperature rises by about 2° to 3°C per 100 m in depth. This geothermal gradient is, however, not the same all over the world but can range from 1° to 5°C/100 m. This type of system can almost be regarded as a heat pump, with warm air in the summer being pumped underground during summer (to cool the greenhouse), and heat being extracted from the ground in the winter months.

Pineapples

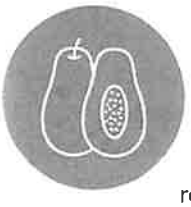
Currently, the majority of pineapples consumed in New Zealand are imported by sea from the Philippines, where they are grown by Dole in a massive plantation at Polomolok. Because of this they must be harvested ahead of optimum maturity, and are a variety suited both for processing (canning) and for fresh market.

There are small areas of pineapples currently being grown in New Zealand, some in the field (where the microclimate allows), but essentially, I consider that pineapple production in New Zealand requires some form of protected cropping.

The main question then is whether using hydroponics might be a better approach than a soil-based system. Certainly, the advantages of hydroponics over soil for the majority of high value greenhouse crops is clear. Whether the New Zealand public is prepared to pay extra for a fresher product, harvested closer to maturity (and therefore hopefully sweeter) only time will tell.

What is certain is that pineapples crop best in warm temperatures, and that New Zealand is really not warm enough for good production unless we take advantage of modern technology.

Mango on dwarf rootstock, Queensland



Papaya

Several years ago, there was some interest in the production of a papaya like fruit (called babaco) in New Zealand. It never really caught on, perhaps because it is inferior in taste (being less sweet) than the standard papaya.

There is some talk of the Cook Islands growing papaya for New Zealand, (Fotheringham, 2021) but (in my view) this has three major constraints, namely: the need to treat the fruit against fruit fly before it enters New Zealand, the airfreight costs, and the lack of modern horticultural knowledge in the Cook Islands.

Papaya can be grown from seed, which poses some problems in that plants can be either male or female or hermaphrodite, and it is only the hermaphrodite plants that are required. This means that the seedlings must be grown on until they flower, in order to select only the hermaphrodite plants.

Winter temperatures appear to be the important determinate of crop production and quality, and some heating during the winter may provide valuable economic advantages. Like most crops they are likely to perform better if grown hydroponically.

Lychee, Longan & Rambutan

These all belong to the same plant family (Sapindaceae), and it appears from the literature that flower initiation requires a drought stress, followed by rains. High tunnels (as rain shelters) will provide the opportunity to drought stress the trees – particularly if they are grown hydroponically in large pots rather than in the soil. Control of flowering should also provide a significant suppression of plant vigour, and thus enable to trees to be grown in a dwarf manner.

Durian

We are unlikely ever to see durian fruit imported into New Zealand. It has a disgusting smell yet a very pleasant taste and texture.

Other tropical fruits?

There is a wide range of other tropical fruits which deserve to be grown in New Zealand. Many of them have already been tried, but with mixed success. With global warming and the additional protection afforded by relatively cheap plastic clad greenhouses, the potential is excellent. New Zealand's unique freedom from fruit fly might one day even open up a market for exporting tropical fruit to Japan! ●