



Riversun Nursery managing director Geoff Thorpe with Riversun avocado regional representative for Bay of Plenty and Coromandel, John Cotterell, surrounded by Maluma Hass avocado trees in the nursery's source block just outside of Gisborne.

| By Diana Dobson |

Avocados ascendant

An industry with plenty of potential

At the moment, just about everything to do with avocados has a 'breakthrough' technological element – including the source material itself.

In 2005, the AIC and Gisborne-based Riversun Nursery Ltd embarked on a joint venture to import new avocado varieties and rootstocks to ensure New Zealand growers gained access to new and improved plant material from overseas. The undertaking is now bearing fruit, particularly in the area of clonal rootstocks.

Produced as rooted cuttings (the only way to create genetically identical plants), clonal rootstocks offer significant benefits: (1) high tolerance of Phytophthora (a root rot); and (2) uniformity in the orchard.

Although the propagation techniques

have been around since the late 1960s, only a handful of the world's several hundred avocado nurseries currently work in this area. Riversun is one of them.

Riversun managing director Geoff Thorpe has dealt with the propagation of 30-odd horticultural crops in his career and says nothing comes close to the challenge of clonal avocado production.

"We did a lot of research before we jumped in, and we knew that clonal rootstocks represented the 'Everest' of propagation," Geoff says.

The procedures involved to produce clonal rootstocks are daunting: a small shoot of a rootstock cultivar is forced to produce roots in the nursery by a complicated procedure using plant hormones, grafting to a nurse seedling and etiolation (growing in the dark). It is time intensive, which adds significantly to the cost of the end product.

"Some growers remain skeptical where clonals are concerned because of the price

difference between them and seedling rootstocks," add Geoff.

Jonathan Dixon, however, believes clonal rootstocks represent the future of the avocado industry.

"Rootstocks bred for tolerance to Phytophthora may eliminate the expense and time of trying to treat the rot. It used to be that if you had a tree die of Phytophthora it was difficult, if not impossible, to establish a new one nearby, but that is now easier."

That means older orchards can be replanted with healthy new stock and land that used to be considered marginal may now be able to produce a crop.

Focus on high density

There have also been important developments in orchard management. Avocados are notorious for alternate bearing, which not only impacts on growers' incomes, but adds headaches for marketing, given the difficulty of

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guaranteeing a stable supply.

"That alternate production cycle has made some people think twice about growing avocados," says Geoff, "but new methods involving high-density plantings lift the amount of fruit, so that, with careful management, the grower has a better chance at minimising the tendency toward alternate bearing."

Historically, avocados have been planted with large spacings. Typically, planting densities started at 180 trees per hectare (spacing at 7m x 7m), with thinning to 90 trees per hectare 7 years later and to 45 trees seven years after that. The sheer size of a full-grown avocado tree – often 10m high – creates complications in itself, but it can often take 10 to 15 years to reach full size.

"It was really only in the 1980s that people started looking across the industry at the cost of labour, safety, and faster establishment phases. They wanted to get into production sooner."

That led the way to innovative research in several areas involving clonal rootstocks: increased resistance to disease, the production of smaller trees that fruit earlier, and the ability of trees to grow in a wider variety of soils. The University of California (Riverside) and, particularly, Westfalia in South Africa have led the way in terms of genetic research, with many of the newer cultivars, such as Maluma Hass, and clonal rootstocks, such as Dusa™ (Merensky 2), being the end result.

"It's all about uniformity," says Geoff.

"Research continues into selecting fruiting and rooting varieties, and the search is on to find dwarfing rootstocks."

The oldest high-density plantings in New Zealand are only three to four years old, but in Chile, where growers have gone into it in a big way, plantings are already eight to 10 years along. Higher density means higher yield: plantings at 3m x 3m have the potential to boost yields by close to 300% per hectare.

High density is well worth trying, says Jonathan. The key issue is managing the growth of the tree.

"These are very vigorous trees and to keep them cropping heavily while holding the size down is a very big challenge. The scientist in me wishes someone in New Zealand had just done a couple of acres to see what would happen – it's still early

days, but, having said that, there is a huge international effort underway to resolve this challenge."

Ripe for tonight

Where other horticultural crops typically have their price dictated when too much fruit comes onto the market, avocados have so far been able to maintain price stability and even price increases thanks to effective consumer awareness campaigns on their nutritional value.

"World wide, avocado production has been increasing rapidly, yet the prices have remained relatively stable," adds Geoff.

Eventually, of course, what to do with extra fruit will become an issue.

"You can't sell it all as fresh," observes Jonathan.

"Some fruit will be poor quality, and the New Zealand local market is restricted as we are not massive avocado consumers just yet."

Big-picture thinkers have already created one value-added product in New Zealand – cold-pressed avocado oil, which was introduced by The Grove in 1999. Sold at a premium price point, the oil has been praised by chefs and nutritionists because it is high in mono-unsaturated fats and vitamin E.

"Value-added products lift the bar for the industry. This is where the idea of using ultra high-pressure technology comes in as well."

John Schnackenberg, chairman of the Avocado Growers Association and the AIC, agrees that ultra high-pressure sterilisation treatment used successfully overseas shows real promise. In this instance, avocados are cut in half, the stones are removed, and the fruit are vacuum-packed before undergoing ultra high-pressure treatment (at 85,000 psi) to ensure a longer, safer, shelf life.

"Growers benefit in two ways – greater demand for fruit that otherwise does not have an economic home, and a restriction of excess volumes of fruit reaching the local market," John adds.

Meanwhile, avocado pulp products are already in use in New Zealand – particularly in restaurants and other catering enterprises. Calavo Avocado Pulp, based in California, is one of the largest companies in this area, providing

pre-packaged pulp, guacamole, and other dressings and sauces that have traditionally relied on fresh fruit as their base.

Other technological developments also show promise. One programme in the United States, called 'Ripe for Tonight', doubled avocado sales virtually overnight. The programme requires packhouses to pre-condition or pre-ripen their fruit (typically by treating avocados with ethylene for a short time before shipping to supermarkets). The process sharply reduces both the time it takes for fruit to reach full ripeness and helps manage the variability between ripening profiles for different varieties.

Currently, New Zealand's consumption of avocados remains relatively low (1.77kg/capita versus 2.5kg/capita in Australia). John, however, believes domestic consumption has the potential to increase with significant industry investment in promotions and once the retail industry consistently adopts pre-ripening technologies, because consumers can then reach for a ready-to-eat avocado on supermarket shelves.

Fruit of the future?

Geoff and Jonathan agree the avocado industry in New Zealand is now at an exciting crossroads.

"As an industry, we want more avocados planted," says Jonathan.

"Part of my job is to manage the importations new avocado varieties, and to do evaluations on them. We want tree management systems in place that are robust and don't just work by chance."

"What works in California or South Africa may not do the same here, so it is all about adopting what we learn overseas and adapting it to New Zealand," adds Geoff.

"I have already seen people establish clonal trees in areas with Phytophthora, and the new scions are showing great promise. With so many technological developments occurring practically simultaneously, I believe avocados are entering an exciting new phase in New Zealand."

More information on avocados, including how to plant and establish clonal trees, can be found on both the AIC's and Riversun's websites: www.nzavocado.co.nz and www.riversun.co.nz