

CUTTING Edge

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New Avocado Cultivars and Rootstocks - What's Best for the New Zealand Avocado Industry



The Cutting Edge is a regular article written by Dr Jonathan Cutting for the New Zealand avocado industry magazine, AvoScene.

All fruit growers need to be aware of global cultivar and rootstock trends and determine how changes in customer and consumer preference affect them. Some fruit sectors, such as stone and pome fruit are very reliant on cultivar change to revitalise their businesses and others fruit types such as pineapples and bananas less so. In New Zealand there is a deliberate programme of importing new rootstocks and fruit cultivars that look promising and may add value to our industry. So what is important to New Zealand and where and how should we focus our resources?

The New Zealand climate grows the Hass cultivar well. There is also an international trend toward continual consolidation around the Hass cultivar. There are many avocado cultivars but none has come close to commercially matching Hass and Hass is slowly but resolutely displacing traditional cultivars such as Fuerte, Bacon, Reed, Zutano and Edranol as well as West Indian greenskins. I am not aware of any other true competitor that has been identified as capable of replacing or displacing Hass.

Rootstocks

So what are our opportunities in terms of new genetic material if we are reasonably certain that the Hass cultivar is here to

stay, at least in the short to medium term (5-20 year time frame)? **The future for us here in New Zealand is improved rootstocks.** *Phytophthora cinnamomi* induced root rot remains our biggest and most universal threat. We do have a single chemical (phosphorus acid salts), which provides a measure of curative action and prevention. This is not a guaranteed long-term solution and we need other options, which are sustainable and cheaper. In addition organic growers currently have very few options for root rot control apart from selecting the very best soils available.

The New Zealand avocado industry is almost exclusively on seedling Mexican rootstock (mostly Zutano), and we are aware of some horticultural deficiencies with this rootstock, such as susceptibility to soft body rots and graft incompatibility results in alternate bearing. Zutano is not resistant to root rot and our experience here in New Zealand shows that it is very prone to drowning. It is well known that New Zealand enjoys reasonable to high yields but individual tree performance here is inconsistent, and generally our tree population age is still very young. We may indeed run into new problems as trees age. If we are to achieve our industry goals of improving yield then we need a better performing rootstock.

There are many rootstock selection initiatives in most avocado producing countries. I am aware of only two rootstock breeding programmes that are of special interest to New Zealand, one in South Africa and one in California. We are in contact with both breeding institutions and have testing agreements with them. Rootstock breeding has been successful with several rootstocks

currently in use, or in the advanced state of evaluation. The Avocado Growers' Association has an active programme of acquiring superior rootstocks and testing them under New Zealand conditions. The only rootstock currently available for commercial use in New Zealand is 'Duke 7'. The Avocado Growers' Association is hoping to negotiate the commercial release of two additional rootstocks in the next three years.

Scion wood cultivars

There is an active programme of Hass sport selection in several avocado-producing countries. In particular there is a desire by many growers in other countries to look for sports that have higher yielding or earlier maturity than Hass with the aim of increasing the Hass season and increasing Hass profitability. We are aware that such sport selections have been identified in Chile and Australia. In New Zealand we need to be active in searching for such sports here.

In truth nearly all, if not all, the commercially successful cultivars have come from selections from orchards and home gardens rather than from managed breeding programmes. I am quite certain that there are Hass sports out there in our orchards in New Zealand that could be beneficial to our industry. Our challenge is to get orchardists, and especially harvesters, to note any fruit differences on branches in trees, and then work with industry to determine if there are any commercial benefits from the sport. There are financial benefits to growers in that the owner of any sport can apply for Plant Breeders Rights and if the selection is found to be commercially viable after evaluation, then the grower will have the opportunity to earn royalties.

California and South Africa both have cultivar breeding programmes. The New Zealand Avocado Industry Council has a testing agreement in place with the University of California and is testing three scion wood cultivar selections. This is obviously a long-term programme and the cultivars need to be thoroughly evaluated prior to application to the owners for a

commercial release. The NZ avocado industry needs to be aware of the developments elsewhere and learn from the many mistakes associated with premature release. We have only to remember the difficulties associated with the "Gwen" cultivar here in New Zealand and elsewhere to realise that the release of a new cultivar is not necessarily an automatic commercial success.

The situation with Pinkerton in South Africa is also worth considering. This cultivar is a prolific cropper of large fruit. The trees are prone to setting such large crops that branch break is not uncommon. Growers thought they had found the Holy Grail in terms of yield (and therefore profitability). As it transpired Pinkerton had a range of physiological and postharvest problems ranging from big differences in fruit maturity within a population on a single tree to poor storage and shipping results. The outcome is that this cultivar has developed a commercial "reputation", and is not viewed as favourably as Hass by the market. Importantly, it is requiring a significant research effort to remain commercially viable, rather than successful, as growers struggle to protect their considerable investment in this cultivar. How did this situation occur?

It arose because of the strong push by nurserymen to "launch" the new cultivar, largely on clonal rootstocks using combinations that were commercially untested and with only very limited market and shipping evaluation. The cultivar was pushed because of 1) heavy and consistent yield and 2) upright and compact growth form. In other words it was pushed for production based horticultural characteristics. It was not pushed because of fruit performance in the market. The lesson for everyone here is that new cultivars need to be evaluated both from a horticultural perspective and commercially in the market. The concept of "fast tracking" should only be activated after extensive evaluation and the decision to fast track should come collectively from growers, the market and nurserymen. To leave this decision in the

hands of nurserymen alone, as happened in South Africa, is folly as their commercial drivers are slightly different.

So what should we do here in New Zealand to ensure that there are no premature releases of cultivars while at the same time ensuring that we do not miss out on exciting commercial opportunities.

First, we need good leadership and governance with clear policies and processes for importation, selection, testing and evaluation, release and finally “fast tracking” to ensure sufficient volumes to gain marketing scale and efficiency. There is a cultivar committee, which is largely inactive at present due to the deadlock with MAF Biosecurity in relation to access to a Level 3 quarantine facility. The Avocado Growers’ Association is in the process of developing policy for new cultivars and will work closely with Avocado Nursery Council in this regard. Progress in this area has been slow, as the industry has grappled with the wider and more immediate issue of ASBV variants in a small percentage of our trees.

Second, we need resources, facilities, partnerships and capability to ensure that the process issues can be adequately addressed. This is important, as our industry requires a whole series of events to occur both sequentially and rapidly, from offshore intelligence as to what is “new and hot” in cultivars and sports, to access to Level 3 quarantine facilities, to gene blocks and evaluation through to commercial testing. To date we have not undertaken detailed costing but initial estimates put a new cultivar release at more the \$200,000 direct costs to the industry organisations. There would be additional costs to growers and marketers.

Third, we need good relationships with a range of people and organisations, most of them offshore. For example, we need good relationships with Plant Variety Rights holders and offshore breeders and avocado plant gene evaluators. We also need open and honest dialog with New

Zealand avocado nurserymen to ensure ordered releases and sufficient capacity. In the case of industry organisations and nurserymen it is essential that we have appropriate structures and processes in place that ensure protection of Plant Breeders Rights and the efficient collection of royalty income.

What can you do as a grower? Get out there into your orchard and look for sports and superior trees. If you find something please, please, please give us a call - it may just be worth your while and could be worth a lot more than your orchard!