CUTTING Edge

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Can't see the wood for the trees?

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

I have been writing the "Cutting Edge" for almost 11 years now. During that time I have seen and been part of an industry that has grown tremendously, not least in planted acreage and staggered at times, not least in terms of yield and regularity of cropping. However, despite all the progress in collective industry systems, many individual growers remain frustrated with a primary production "road block" – the inability to reliably produce a crop every year.

Now we are all aware of a few growers who seem to produce a good crop nearly every year. To the many growers this only adds to the frustration and begs the never ending question "what is that grower doing differently to me and how can I apply that on my orchard with the purpose of more regularly producing a crop?" Undoubtedly growing avocados is a skill and requires knowledge and passion but even if you have plenty of these three attributes you can still fail. Is there an answer to the question of alternate bearing and irregular cropping?

I don't believe that anybody can ***guarantee*** a large regular crop every year although we should always strive to set the tree up to exploit good conditions. Why can we not guarantee a crop every year? Primarily because we are dealing with an interaction between climate, soil and *Persea* biology. We do need to be reminded of this periodically and I encourage all growers to read some of Prof Nigel Wolstenholme's writings in this regard (available in the AIC library). From an evolutionary perspective the avocado is almost designed to frustrate with finely tuned biologically controlled balances between vegetative and reproductive dominance and the further complications of competition within the tree when you are dealing with single seeded fruit and the resulting "small fruit" syndrome (read Dr Keith Cowan's work to gain an understanding of this – fascinating but rather difficult to comprehend and again available in the AIC library). A final consideration is that in our particular environment in New Zealand we are balanced on the edge of climatic tolerance, at least in terms of fruit set and carbohydrate accumulation (the Far North on the other hand is generally blessed with a far better avocado climate).

I hope this is not all sounding too depressing because I believe that there is some light at the end of the tunnel. I also believe that at a conceptual level the answer may lie in the kiwifruit and other fruit industries. In kiwifruit, stone fruit, pip fruit and berry fruit there is an almost singular focus on **the production of fruiting wood for the following season's crop**. In contrast there is an almost exclusive approach of trying to manage fruit set and fruit retention in avocados, and always slightly in arrears (reactively and retrospectively). What do I mean – well consider these two statements often given by growers – "I have a big fruit set but I am short of leaf cover, I had better increase fertilizer and water inputs to feed this fruit load and get enough leaf cover to size the crop and prevent sunburn" and second "I missed

out on a large fruit set and the vegetative vigour is almost out of control, I had better reduce fertilizer and water inputs to reduce vigour". Any of this sound familiar? Well I believe that this is the wrong way to approach avocado fruit growing – we would not do it in kiwifruit, or any other fruit crop for that matter – so why in avocados. The point that growers appear to miss is that next years crop is ultimately established during the flowering of the current year. The management approaches outlined above are exactly how a smart person would design a biological production system that both favours and enforces alternate bearing and results in a crop with a high proportion of small fruits every second year – almost as if this was our primary goal.

So what do we need to do? We need to focus our creative energies and production inputs around the concepts of producing fruiting wood as the starting point and the primary annual goal**. The proposed solution is to always produce enough flowering wood to crop well the following season irrespective of the amount of fruit set**. This requires a mindset one to one and half years ahead of fruit set. We know from New Zealand research that our best "flowering wood" is produced in the November to end of January period. Our collective experience is that a lack of a spring and early summer flush rewards the grower with a very light or no return crop the following season. I do not pretend to have all the answers and the topic itself is very large. There are however some primary considerations and these include the soil environment, root to shoot ratios, water availability, nutrition, root rot pressure, avocado anatomical structures, light and spacing and carbohydrate cycling and reserves. Getting the building blocks right should be considered long before we focus on the next tier of fruit set inputs such as pollinisers, bees and temperature. This is not to say that these are unimportant but they are stage two in the sequence and we need to get stage one right first. There will be some strong opinions and many views on this – and most of them will not be the biological truth otherwise we would have more reliable cropping and crop failure, when it occurs, would be district wide, indicating climate reasons, rather than the current outcome of neighbours having very different crop performance, indicating management reasons.

The purpose of this "Cutting Edge" is not to throw stones but rather to get all industry participants to think and ponder the goal of producing flowering and fruiting wood as the primary annual production activity. The new rootstocks that will shortly be available in our industry will not solve this problem as we will still be growing Hass on them, with all its present genetic limitations. I also believe that people like me will be retired and fishing more actively before a "new" cultivar fully replaces Hass. Hass is what we have now and probably will have for the next 15 to 20 years. We had better learn to grow it well and reliably.

Growing avocados is real business, and a global one at that, and there is no reward for lack of performance. It is most definitely not a mysterious religion so we don't need charismatic prophets and gurus peddling scientifically unsupported and far out views and products – rather we need biological truths, sound science and a solid foundation of incontrovertible production knowledge. Some might say I am bordering on hypocrisy and I will be the first to admit that at times I personally find it difficult with a foot in each camp, one as a grower and experiencing grower frustrations and second dispensing good faith advice as a consultant. I also fully understand, as a consultant, the "easy seduction" of providing a grower with a "recipe", even if it is tailored for that particular property, and not really having the time or patience to make sure that grower fully understand the reasons behind the advice – and sometimes the grower isn't interested anyway!.

The wide diversity in production opinion and advice tells me that we have a very, very long way to go and shows me how little we really do know about this crop. A narrowing in the range of production advice and a centering in grower

behaviour will be a real sign of progress. That is not to say that growers should not question or engage in their own innovative discoveries. The amount of empirical production knowledge in New Zealand is extremely small and research has a big part to play in addressing this – unfortunately this takes both time and money and it will be some time before the benefits are realized by growers. We need to make the kind of research investments in avocado production that the Crown is not prepared to.

This is a real challenge for our industry and requires more people to remain in our industry for a working lifetime and that includes more growers, but nobody more so than our scientists, researchers and consultants – the question is are we up to it and can we see the wood for the trees?