

CUTTING Edge

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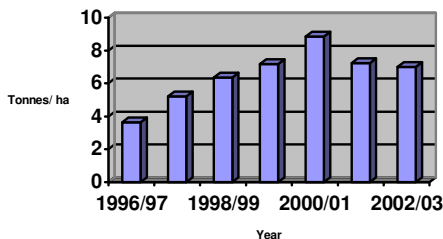
Alternate Bearing and Low Yield – What Can We Do About It?



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

Every year in May the AIC gathers information and data to be included in the Annual Report. One of the more interesting sets of data is annual yield expressed both in tonnes per hectare and total tonnage. Obviously the data is never quite perfect but we are confident enough in the information to publish it in the Annual Report. Anybody taking a strong interest in long-term trends and involved with the New Zealand avocado industry would be concerned with what is happening in terms of yield

National average yield from 1996 to 2003



The implications of falling yield and lower values will have serious impact on orchard gate returns, both nationally and at the individual grower level. The Bay of Plenty Regional Discussion Group has established a working party that is focussing on profitability. It has developed

an exceedingly useful economic model to investigate orchard profitability and evaluate orchard costs. One of the more useful outcomes of this group has been an ability to focus on “*what growers should do or strive for*” to maximise profitability. The clear winner in the grower “holy trinity” of pack out, fruit size and yield is, undeniably, yield. Consider the table below.

Table 1. National and average Orchard Gate Returns

Year	National Orchard Gate Return	Average property Orchard gate return/ ha	*Elite (15 tonnes/ha) Orchard gate return/ ha
1999/00	\$ 22.101 M	\$ 17,709	\$ 36,996
2000/01	\$ 25.688 M	\$ 18,052	\$ 30,563
2001/02	\$ 23.306 M	\$ 14,176	\$ 29,371
2002/03	\$ 25.668 M	\$ 13,581	\$ 29,060

The calculation of “Orchard Gate Return” is based on industry gathered data for income, national average yield and national pack out. *The elite property represents the stated industry goal of 15 tonnes per ha average for the industry. There are a very small number of growers who are achieving yields above 25 tonnes per ha so as can be imagined their per hectare orchard gate returns are considerably higher than \$30,000.

If a grower achieved a yield of 25 tonnes per ha in 2002/3 and achieved industry average pack out and size distribution their orchard gate return increased to over \$48,000 per ha. Increasing pack out to 75% and improving one count size added a further \$6,000 per ha. If however the

grower achieved 75% pack out and increased fruit size one count but only achieved the industry average yield, the per ha orchard gate return only increased from \$13,581 to \$15,203.

So what does this all mean? It means that growers need to seriously focus on yield. Only when they have upskilled themselves in terms of orchard husbandry and are achieving yields of above 15 tonnes per ha should their focus shift to the other two income drivers, export pack out and fruit size. In essence - yield must come first. Put another way, high export pack outs of large fruit without yield is not a survival strategy. I know, and can already hear, growers who have been in the industry many years being somewhat concerned at a strategy that sounds like the production of lots of local market fruit – not exactly what we need! And I agree with that sentiment. I accept those concerns are real and need to be addressed but I have to believe that all growers are in this business to make money – and money is primarily made through profitability and profitability is primarily achieved through yield. Export pack out and increased fruit size are the “icing on the cake” that turns a good business into an excellent business and should in reality separate our elite growers from the average. It is somewhat sad and disappointing when yield four times the national average is what separates our elite growers from the average. Quite frankly a kiwifruit grower or a dairy farmer, producing **one quarter** of the yield of elite producers, would probably be evaluating their continued involvement in those industries.

I hear the cries blaming climate and the laments - “its two bad springs in a row” and “export pack outs are really low because of the year” etc. And yes, nationally our yields have dropped by almost 20% in the past two years, and the cause is largely climate (cool springs). However, there are still many orchards that have continued to crop well. In fact there are some record avocado crops around and in some cases right next to orchards that have done exceedingly

poorly. There is obviously a lot more to this than climate alone.

So what can, and what should, we do? I have some ideas and industry participants are free to agree or differ with me. That is the wonder and privilege that is free speech. First, as an industry, and most definitely as individual growers, we need to embrace a scientific approach to growing avocados. There are many facets to this and I will discuss some of them in the next two **Cutting Edges**. A real concern that I have is the growing sense of “cult” within the provision of technical information to industry. You may ask what I mean by “cult” and I refer to the decision by growers or consultants to adopt a certain approach not because it is based on good science but because of a simple unsupported “I believe” approach – the end result is that we have lots of “believers” who do not follow a scientific approach. These same “believers” are convinced that silver bullets exist and that solutions to orchard problems do not rely on a particularly strong understanding of all the factors and inputs involved in orcharding. The really disturbing aspect of this is that when orchard failure occurs it is almost impossible to identify the cause. I have seen this style of “knowledge transfer” creep into our industry at many forums stretching from certain beliefs around the “green” approach (and I am not “green” or organic bashing here) to information provided to growers at field days and seminars.

The scientific approach is an important and underlying principle in modern agriculture. This requires participants to read and understand the literature and interpret the information in such a way that it becomes useful and adds value to a production system. In very simple terms the avocado tree is exposed to inputs; namely light, water and minerals (both gaseous and in solution). From these raw elements the tree produces photosynthates and uses photosynthates for respiration and growth. Temperature affects the rate at which these processes happen. Stated simply the production of photosynthetic products must exceed the

use of the photosynthates for respiration and tree growth and maintenance. The surplus goes to fruit production and carbohydrate reserve storage. I accept this is an over simplification and that many subtleties determine how this happens. Our challenge, as growers and technical advisors, is to understand, modify and adapt the production system, based on sound scientific principles and knowledge, to perform better in terms of net photosynthetic gain. We harvest the benefits and effectiveness of our interventions in terms of regular and heavy cropping.

I know that the technical message needs to be simple. The KISS approach (keep it simple stupid) really should dominate. There are only two reasons if we are required to overly complicate the message:

- we don't really understand what we are doing or recommending and complicating the message looks good and professional
- we are busy "sweating the small stuff" and ignoring the really important foundations of good production.

To me there are two clear messages:

- Do it right the first time
- Do it at the right time

Both of these messages require that the grower has a certain suite of skills and understanding. The skill that is most lacking, and also happens to be the most important, is the ability to "read" trees. It is vital, for example, to determine when trees are losing leaf condition in autumn, so that properly timed intervention can avoid an alternate bearing situation arising 18 months out. Understanding is important so that the grower knows how to alter the situation, in this case leaf condition, with the correct input or suite of inputs. A very strong understanding of cause and effect is essential for avocados growers. This is the strength and elegance that is experience.

We need to put some meat onto this discussion by way of examples – and I will do that in the next two Cutting Edges. We will consider, first the issue of canopy management and tree size control versus leaf quality as the primary driver of carbohydrate accumulation and, second the importance of root mass, water use and irrigation in achieving regular cropping and high yields. We will consider these questions in terms of the literature and attempt to interpret empirical information in a useful way. After all, this is what innovation and the development of technologies is all about.

It is winter with not too much to do on the orchard. So during these cold evenings in front of the fire read and understand as much as you can about avocados. More importantly, never be constrained about questioning providers of technical information, be they other growers, consultants or scientists. Questioning, and the requiring of answers, is a key learning and understanding tool.