

FUTURE ORCHARDS ` BUSINESS DEVELOPMENT PROGRAM

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Review of the Gala Group Fruit Sizing

In this review we have looked at all the Gala fruit size data to see if there are any trends that we could identify. One hypothesis that we were keen to research was whether the different regions had different growth rates. Another question was, Do the number of days from Full Bloom to harvest vary significantly between regions?

To try and identify these trends we looked at fruit size at three key times throughout the growing season:

1. 42 to 49 days after full bloom (AFB). This is within one week of the end of cell division period
2. 80 days AFB (a point in time where growth rates can collapse in overcropped trees)
3. 110 days AFB, which incidentally was harvest for the very earliest blocks, and as much as 40 days before harvest for later blocks.

Looking at the early period, 48 days AFB adjusted data showed fruit size to range between 25.3mm to 36.56mm. Apart from two blocks in the survey which had fruit sizes in the range of 25.3mm to 27.52mm, most blocks were in the range of 31 to 36.56mm for 48 days AFB.

The blocks showing the 25.3 to 27.52mm at 48 days AFB had reasonably good fruit size at 110 days AFB. This would tend to suggest that the main reason for their lower fruit size at 48 days AFB was the interpretation of full bloom date being a little on the premature side, relative to the other orchards in the group.

However, apart from the two growers with small fruit at this time on their blocks, there was a tendency for 48 days AFB fruitlet size at the upper end of the range to remain larger right through the season.

Fruit sizing rates between the 48 day AFB period and the 80 day period tended to have the greatest influence on fruit size. Fruit sizing over this period averaged 4.3mm/week and ranged from 2.9 to 5.25mm/week. Fruit sizing at rates less about 3.6mm/week tended to be the smallest at around 110 days from harvest.

Average fruit size at 80 days AFB was 51.2 mm and ranged from 44.6 to 59.0 mm. Generally fruit at 50mm or less at 80 days AFB was also small at 110 days AFB. Fruit sizing between 80 days AFB and the 110 day period was less variable than for earlier part of the season, and also at a lower rate. Average fruit sizing rate was 3.3mm/week and ranged from 2.31 to 3.92mm/week.

Average Gala fruit size at 110 days AFB was 65.5mm and ranged from 57.43mm to 73.9mm. The largest fruit size line was harvested by 110 days and the smallest fruit size lines remained on the trees for longer periods to allow further fruit sizing. The higher crop loads of smaller fruit also take a lot longer to mature.

There is a massive range in the number of days from Full Bloom to harvest. The earliest block was harvested at 109 days AFB and the latest block 155 days AFB. The early block had every trick imaginable to get it early and the late block was a heavily cropped M793 block under hailnet and Retained. This clearly

illustrates the value of being able to benchmark your own results with your own history.

Among the States ,Victoria and South Australia had several blocks achieving >70mm fruit sizing at 110 days AFB. Most States, also had some blocks showing fruit size near or below 60mm. The smaller fruit was generally off highly cropped vigorous rootstock trees.

Considering the geographic spread among the blocks, growth rates were relatively similar between the different regions, and for this particular growing fruit sizing rate appears to have been influenced more by orchard management factors such as crop load and rootstock, rather than location. This surprised us as we expected to see larger regional differences.

Seasonal and Crop Load Affects

Two of the Gala blocks in the study contained historical sizing data stretching back over three or four seasons. This data shows big differences in fruit sizing behaviour among seasons for the same block. Both were in Victoria and show that the 2009/10 season had inferior fruit size relative to the other years.

The table below shows fruit sizing history for both these blocks.

Days AFB	Block A			Block B		
	49	84	105	47	82	110
2010/11	35.4mm	61.0mm	71.4mm	24.6mm	51.0mm	66.4mm
2009/10	31.2mm	55.2mm	63.8mm	26.5mm	47.0mm	63.0mm
2008/09	37.7mm	60.7mm	70.2mm	24.5mm	43.5mm	55.5mm
2007/08	35.8mm	63.6mm	72.4mm	-	-	-

For Block A, half of the fruit size differential had occurred by 49 days AFB and almost ¾ of it by 84 days AFB for the small fruit season.

Block B was a young block with its first crop in the 2008/09 season. Its small fruit size that season was probably due to the crop being carried on lateral bud 1 yr wood. Fruit on this bud is usually much smaller than that on spurs and terminals. By delaying harvest in the two small fruit years, fruit on this orchard actually grew to good size when harvested 135 days AFB in 2008/09 and 127 days AFB in 2009/10.

Fruit sizing data becomes really valuable once block history of fruit sizing has been built up over a number of seasons. Within orchard block fruit sizing comparison between seasons have potential to give early signs of block behaviour which enables pro-active management to be implemented to counteract adverse seasonal fruit sizing trends. eg. If the fruit is running small at around 80 days AFB, re-thinning to remove potentially undersize fruit, then application of Retain® to delay harvest and enable further fruit sizing.

Data above of late season fruit sizing shows that if you could get 10 day harvest delay, fruit size increase could range from 2.3 to 6.6 mm in diameter.

Block A is a very good example of this. Block A is in an early growing district so early large fruit is the goal. Management strategies that bring the fruit early are used and crop loads are kept light/moderate to ensure early large sized fruit. In 2010 , the grower admits that in hindsight, he overcropped Block A with the result being small fruit and a late harvest at 123 DAFB. This resulted in a poor fruit value per bin.

In 2011, the target was to drop fruit numbers per tree and go for large early fruit. Take a look at the graphs that have come from OrchardNet and make your own conclusions on the success of his strategies.

Figure 1 Orchard A Fruit Size Report

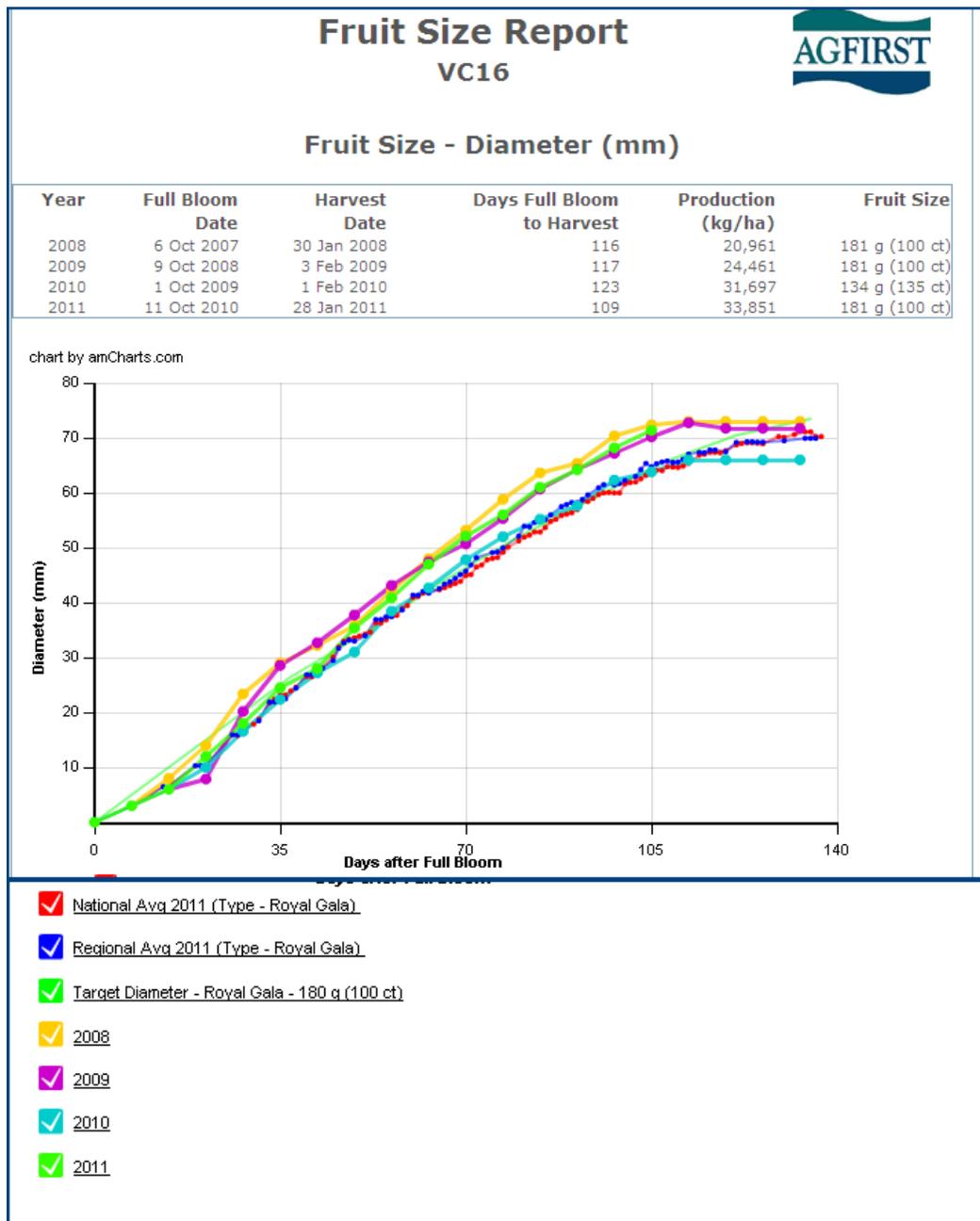


Figure 1 above demonstrates a lot of powerful information.

1. This block has 4 years historical data not only including fruit growth but also yield and actual fruit size outcome at harvest
2. The best comparisons Orchard A can make are with its own history. Target lines and the regional average are nice but the real power is his own data.
3. Note that the growth curves that delivered a 100 count average are different to our target 100 line. This is due to a much shorter duration from FB to harvest. The Gala average number of days from FB to harvest is 130. In Block A the average is 115 days.
4. Note that in the 2008, 2009 and the recent 2011 years, the fruit growth curves are similar and the fruit outcome also similar. The 2010 year was the poor fruit size year and could be identified as early as 50 DAFB.
5. Note the range in Days from Full Bloom to harvest (109-123)

Figure 2 Orchard A Growth rate per week

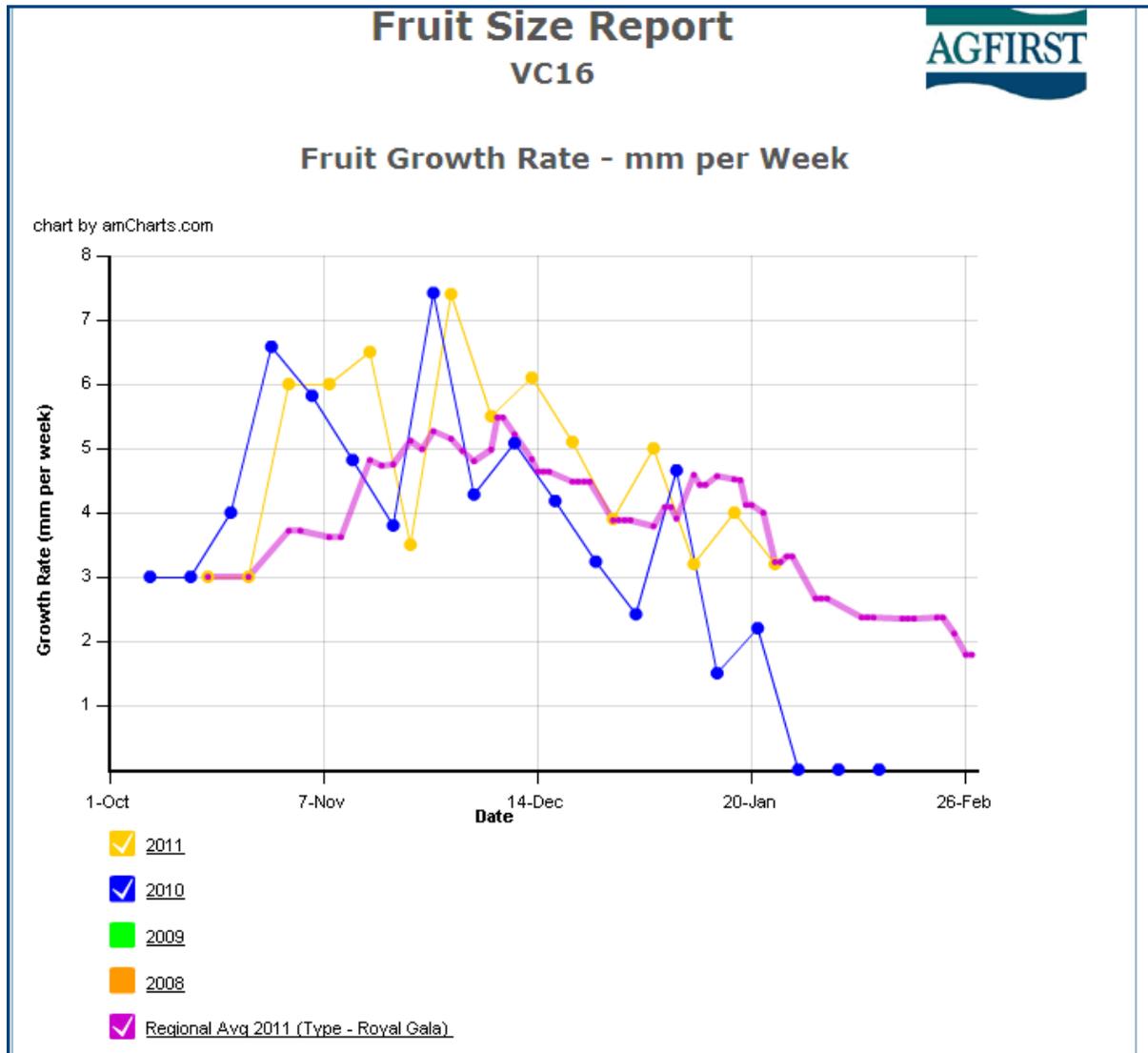


Figure 2 above shows the growth rates per week. It compares the 2011 year with the 2010 year and we also show the 2011 regional average. You can clearly see that the growth rate this year was similar to the poor 2010 year up until mid December. From that date forward the growth rate was on average 1mm/week better than the year before.

Interestingly the big weekly dips are when the district suffered extremely hot conditions.

Block A harvested 34t/ha in 2011 at a 100 count average and harvested it nice and early. The net bin values were extremely good. Although the yield is not high, the profitability is very good.

A good successful result.

Now that's what we call "Growing for **your** Market".