

## **Future Orchard 2012 – Batlow, New South Wales Orchard Walk January 2007**

Notes prepared by Julie Dart, Batlow group facilitator.

The third walk in the series was held at “Ardrossan Orchards” and was hosted by Ian Cathels. The orchard walk started at 2:30 pm to allow growers to do some harvest work in the morning.

At the start of the event there were 27 people in the audience; of this four were not growers. 24 people signed on.



**John Wilton (AgFirst) – see notes in folder:**

Effect of crop load on pressures & brix:

Increasing crop load = decreasing pressures

- Fuji are especially sensitive to crop load, smaller crops give better pressures and sugar
- You need to set the crop load to the conditions. In a drought, conservative size crops survive well. If they are overcropped sizing it will be difficult.

Harvest management is critical for good quality:

- Harvest at correct maturity
- Handle properly at harvest

### **Royal Gala**

- In NZ the fruit higher in the tree often lags behind fruit lower in the canopy (NZ use starch to assess maturity). Could there be more starch accumulation in the upper tree?

**Q:** *To avoid it what can you do?*

**JW:** *Look at pressure and brix as well to help make a better decision. If brix is rising, but the starch is stable, then the fruit is moving. You can go from starch chart 0-6 within 4 days in NZ.*

- It is better to use all 3 methods -starch, brix & pressure to judge maturity- (as we already do in Batlow).

### Colour

- Use Extenday™ to get colour to match up with harvest maturity. Otherwise you end up with over-mature fruit while waiting for colour.
- Fuji has the best colour response to reflective mats.

### **Dr Terrence Robinson (Cornell University, Geneva USA)**

Terrence talked about trends in apple production in the US.

- US growers moved from large, vase trees to central leader in the 1960's
- In the 1980's the tops became too heavy, too much shading was a problem.
- \*Do not allow large limbs to grow in the tops of trees!

By the late 1980s the industry standard was slender spindle on M9 at 1500 trees/ha.

- Trees individually staked
- Tying down branches common
- Only getting 30-35T/ha yields, this was lower than expected
- The trees were only 2m tall and were too short
- The canopy was only intercepting 50% of the light

Multi-row systems were attempted to capture more light, but didn't quite work.

So the industry moved to taller trees (3.5-4m) to overcome light problems

- Trees now managed so there were no permanent scaffolds

- M26 grew too big in New York state, so went back to M9 (at 3m tall, 1500 trees/ha)

In the mid 90s growers moved on to super spindle:

- 60cm in-row
- 3m between rows
- 5, 500 trees/ha
- trees are a column shape
- growers expected problems by year 10 because they were unfamiliar with higher density, BUT
- trees only grew fruiting twigs off the trunk (no room for heavy branches)
- one grower has a 14 year old block that is still doing well

This original pioneer could afford to plant at 5, 500trees/ha because he:

- grew his own trees
- cut his own posts from farm woodlot

Most growers in the US are scared of the figures for this density, and trees only cost \$6 there (\$33, 000/ha for trees).

In 1998 there was a major crisis in the apple industry. Prices were really bad. So the industry:

- revamped the marketing scheme
  - formed 2 large co-ops ( East & West coast)
  - had legislation passed that allowed the 2 groups to co-operate on price
- changed to new varieties
- improved the quality of existing varieties by using Smart Fresh (1-MCP)
- aim to produce more for less by using the best systems

It is important to choose the best rootstocks for the system. For M9 choosing the best clone is important.

- Nic 29 and Pajam 2 are vigorous
- The NAKTB (Dutch) 337 clone is weak
- Bud 9 is weaker than all M9 clones again. It can be too weak unless trees are planted closer than 1m within the row.

Other aspects to consider for high density plantings:

- Cropping reduces tree growth
- Root competition has some effect
- Pruning MUST change, focus on growing young wood, not scaffolds
- Growing fat wood shifts the tree energy balance. Big branches feed tree vigour

- No big branches = easier, quieter tree

### **Economic models:**

Terrence has been studying the economics of various tree densities for many years at Cornell.

- The highest density is not always the most profitable
- The studies assumed at 6% return on investment, and that trees were individually staked
- The best profits are gained around 2500 trees/ha
- Keys to profit at this density are cheap trees and inexpensive trellis. These factors can significantly impact on economics of the systems

From an investment perspective, super high densities are not an option. The tree price is critical, as it can quickly drag back profits in high density systems.

### Fruit Price:

- New varieties must get high returns to be worthwhile investing in
- Growers MUST achieve maximum yields to make high density systems work economically

### **Terrence's Ideal system:**

Tall Spindle system:

- 0.9-1.2m between trees x 3-3.5m between rows (2,380 – 3,703 trees/ha)
- 3m tall (or 0.9 x row spacing)
- no permanent branches
- highly feathered nursery trees
- minimal pruning at planting
- feathers tied below horizontal at planting

Where narrow rows are not possible- V trellis

- 3000 trees/ha
- 0.6-0.7m between trees down the centre x 5-5.5m rows
- plant trees in a single row and then arrange either right or left easier to manage weed sprays)
- trellis 3m tall
- Terrence prefers single row systems, V's are really a compromise for situations where the row spacing can not be changed
- Typical US feathered trees require some pruning and significant branch tying
- Feathers start at 80cm (hip height)
- The more feathers the better

#### Training:

- Do not head the leader
- Take out large branches

#### Rootstocks:

- Hot climates may need stronger clones to handle heat stress? Of the Geneva stocks (not yet available here) G11, G16 & G41 are all M9 size. Terrence's favourite is G41
- For semi dwarf plantings (M26) use G202 & G6210 (to be released as G210)

#### Questions:

IC- What is the success behind club varieties?

TR- For me the club system is yet to be fully proven, but clubs allow volume control. In the Us Jazz is doing well in the club format. The system will fail if the variety chosen is mediocre.

DP- You have spoken about the need for better nursery trees. How do you convince nursery people to grow the right trees?

TR- It's been a real battle. I convince growers that they need to apply pressure, and I also try to directly work with the nursery industry to help improve their technique. To get a well feathered tree you need 2 applications of Cylex and 3 lots of leaf plucking.

#### ORCHARD WALK



Terrence started the talk off discussing getting size in Gala

In the US big fruit gets the dollars.

- 80 count fruit is the target size
- Fruit size depends on the management of pruning, thinning, fertilizers and irrigation
- Gala is a heavy bloomer, not biennial bearing
- For mature trees you can stub back 1/3 of potential buds, in Chile they “spur prune” by rubbing off 1/3 of the fruit buds by hand. The cheap labour and solaxe system allow this to work economically.
- In the US we use Cylex with liquid Carbaryl to thin at 12mm fruit size. The surfactants in the liquid Carbaryl really help
- We also use ATS at bloom, then Carbaryl, then Cylex + Carbaryl

The Americans have a liquid formula of Carbaryl “XLR” that allows them to apply at blossom that is supposedly safe to bees once it has dried- DON’T try it here- we don’t have this product!

JW: Take bees out of the block once kings are set.

RG: flowering is irregular here

JW: Have you tried dormancy breakers? Also take out unnecessary one year old wood out at winter to leave more mature spurs. If you simplify the branches by removing 1 year old shoots the flowering should be more even. You ideally want 8-10 branches per metre of trunk low down and 11-12 up higher. Bourse shoots are good. Terminate 6 weeks after flowering. I prefer thinning to singles. You can then take fruit out late (if needed) to size crop. Singles are also less likely to burn.

- Save money at harvest by leaving the rubbish fruit in the orchard, don’t send it to the shed where you will pay to store and grade it.

Harvest management:

- Retain® delays harvest maturity by 7-10 days
- It can increase size by 7-10% (one size count up)
- Need to apply it 21-25 days before anticipated harvest

Drought can slow maturity. The trees will show less response to Retain in drought years.

MV: Retain still works, but maturity will come on quickly when it does (nothing to mature in 3 days), it is still a good tool

JW: Don’t bother using it on low colour strains as it can hold colour back a bit, we deliberately use it to stop certain varieties getting too dark.

M: What about Zenifos (??) to improve colour?

JW: There have been no good trials done to prove benefits

MV: It might be useful in a drought if you are lacking Phosphorus to start with.

JW: It's the same with foliar sprays of Potassium to improve colour. It will work if there is an underlying deficiency

RG: What about Cylex and size?

JW: Definitely in Fuji and Gala, around 7-8% increase. It enhances return bloom in Fuji, independently of thinning. It is a useful product, even if it doesn't give a lot of thinning effect. Cylex is temperature dependent (18-20's degrees), 28 is too hot! It also won't take put tip apples in Fuji (another reason to get 1 year old wood out in winter!).

The orchard walk concluded at 5:30 pm.