

Prune Quality Field Day

April 21 2010

Griffith Centre for Irrigated Agriculture



Prune growers, advisors and Industry & Investment staff attended the “Prune Quality” field day.

The program:

9.00am	Welcome and Introduction	
9.15am	Soil Health	Karl Andersson CSU
9.45am	Prune Nutrition	Peter Reynolds
10.15am	Morning Tea	
10.30am	Dehydration issues	Grower forum
11.00am	Trial reports	Anne Mooney
	Variety trial, processing the D’agen clones	
11.30am	Irrigation	Donald Irving
12.00am	BBQ lunch	
12.45pm	Budding demonstration	Andrew Creek
1.15pm	Pruning demonstration	



Soil Health

Karl Andersson, CSU

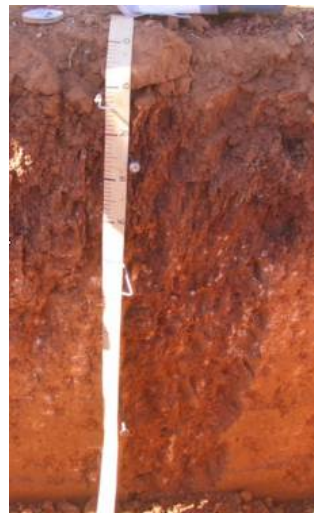
- Health = physical, chemical and biological properties and the management requirements and effects on them
- Not simply = soil quality, which is “fit for a purpose”
- Eg – sandy soil for vegies
 - Easily sterilised (pathogens), well drained (aeration), highly permeable (control water), not easily compacted (trafficable under diff conditions), low nut retention (control supply)
 - Not necessarily a healthy soil
- Robust & resilient for plant requirements & ecosystem functions
- Soil properties and their management for certain situations and plants
 - Can be targeted to certain limitations
 - May have other effects – positive or negative to other soil properties
 - Does the management system become dependant on the treatment?
- Fit & healthy: SOC may not change but more growth and breakdown (cycling of nutrients, diff bug activity) better than nothing

Levee
Sandy Red Earth



Free draining,
May be acidic

Meander plain
Red-brown Earth



Subsoil lime....
salt at depth?

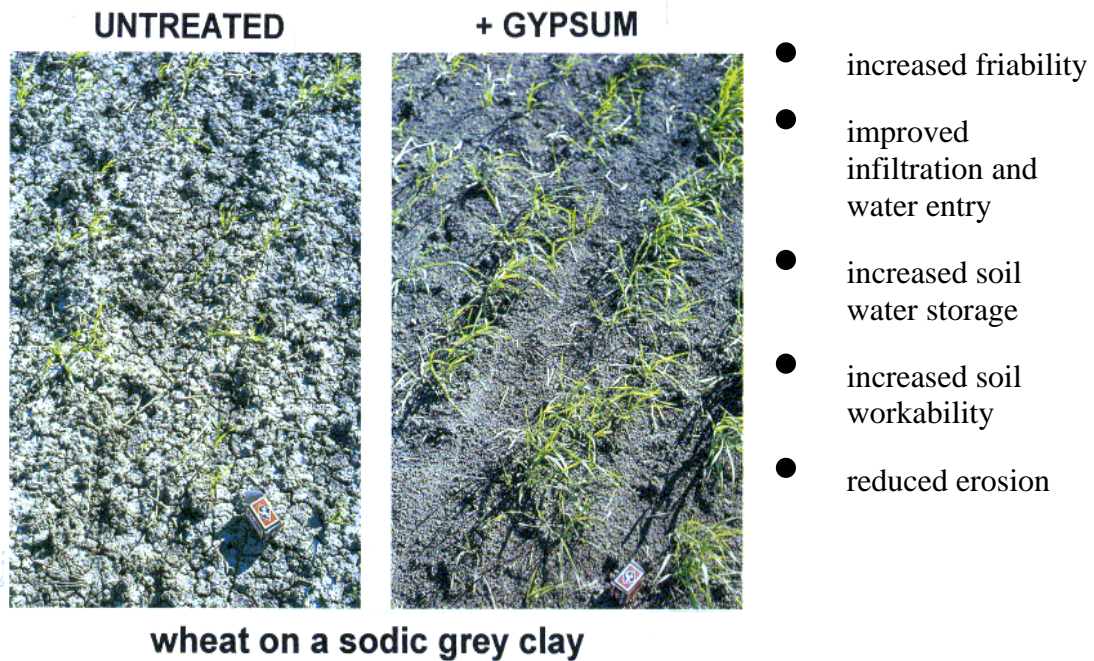
Backplain
Clays



Gilgai soil



Improving soil structure using gypsum (CaSO_4)



Irrigation water quality

- Salts are applied even in good quality irrigation water
- These salts need to be leached beyond the rootzone to avoid accumulating to high amounts
- This requires an extra amount of water more than the plant needs to flush the salts, called the “leaching fraction”
- The leaching fraction amount depends on the water quality and the equilibrium target soil salinity

Organic matter

- stubble on surface protects the soil
- recent organic matter (including roots) is a source of food and energy for microbes and a source of nutrients
- glues from roots and microbes hold particles
- decayed (humus) long, charged ropes
 - hold sand, silt and clay together
 - contains, holds and slowly releases nutrients
 - cations - eg Ca^{2+}
 - anions - eg NO_3^-

Summary Soil Health

Prune Nutrition Peter Reynolds, Yenda Producers



Leaf Testing 2010

- 41 samples taken from 20 growers;
- Griffith, Yenda, Hanwood, Darlington Point & Coleambally;
- Different varieties, irrigation and soil types;

Results:

- Samples either taken by YPC Staff or the growers;
- Samples sent to Incitec Pivot Lab in Geelong in 3 lots, end Jan early Feb 2010;
- Each sample given a number a plotted on a graph to show range of results for each

Nitrogen

- 24% of samples were below the minimum of 2.4 % (10 samples);
- The 2 samples with high N had late nitrogen applied;
- The LOW N crops all had large fruit numbers and a higher % of small fruit at harvest.
- Summer applications of N more likely to cause soft fruit & more splitting.

Phosphorus

- 1 sample was below the minimum of 0.14 % and this was a block of old prunes that had just converted to Drip Irrigation and had a history of Low P;
- Samples 4, 14, 18, 25, 34 & 35 were all D'Argen variety;
- The 3 samples with high P had recent applications of P fertiliser.

Potassium

- No samples had below minimum level of K;
- 17% of samples had higher K but only 1 sample had K applied as fertigation but no response in the leaf;
- Debatable if there is any positive response to K in this region.

Calcium

- 29% of samples had below minimum Ca level of 1.5%;
- Some of these had Ca applied as Cal Nitrate but a with low soil Ca or old trees;
- No samples with excessive Ca;
- Some Ca applied via irrigation water.

Zinc

- Only 1 sample had below min. level of 20 mg/kg, this crop had no Zn applied;
- Some Zinc taken up from Zineb fungicide;
- Some Zinc applied as foliar fertiliser;
- Most MIA soils are very low to deficient in Zinc.

Boron

- No samples below minimum;
- 22% of samples exceeded the suggested max. level of 60 mg/kg.
- These were from – naturally high Bo soil levels or;
- From Tile Drained blocks where the tile drainage has been turned off & no flushing irrigations for some years.

Other Elements

- Sulfur, Magnesium, Manganese, Iron & Copper – all samples were in the adequate range. No deficient or excess levels;
- No samples showed high Sodium / Chloride levels. Indicates good irrigation management;
- 1 sample had higher Chloride – old trees on flood irrigation.

Fertilizer Programs

- *1. Autumn – Post Harvest*
- Nitrogen is most important, especially after a stressful season (for the trees !).
- Apply to 1/3 to 1/2 of total season's Nitrogen as post harvest, but not too early to cause reshooting / re-flowering.
- Annual application of 100 – 120 kg N/ha/year for fully bearing trees
- Phosphorus can also be applied postharvest – solid fertiliser or via fertigation.
- Calcium can be applied as Gypsum or Lime (lime, only if low pH soil) – spread and worked in over autumn / winter.
- *2. Spring – Post Fruit Set cont.*
- Zinc and other Trace elements can be applied in early spring as a foliar spray (may be mixed with some fungicides);
- Copper, Manganese, Iron & Boron generally not needed unless testing low;
- Small amounts of N:P:K can be applied by foliar spray;
- K is probably best applied foliar at or after pit hardening.

Fertilizer Summary

- Important to apply Nitrogen in Autumn & Spring (early);
- Avoid summer applications of Nitrogen;
- Phosphorus usually applied at planting and then once every 5 or so years;
- Apply some Calcium by ground applied or foliar;
- Zinc and other Trace elements can be applied in early spring as a foliar spray
- Copper, Manganese, Iron & Boron generally not needed unless testing low.

Grower discussion, dehydration issues Comments from attendees

- Weather was the main issue this season, there was a large blue drop pre-harvest
- A large crop put pressure on dryers
- New tunnels were kept very busy
- Fruit from Yenda, Colleambally and Griffith all came in at once
- There is not much profit in contract drying
- Growers attempted to pick crop at optimum sugars
- The order of harvest was reversed this year, later clones were picked first
- Results from Henry's project are required now to benefit next season
- It would be good to know if Henry's alterations worked this season
- Tunnel capacity and cost savings need to be looked at
- Storms during harvest increased humidity and affected drying times
- Later fruit was of a good quality
- Extra drying capacity is needed in high cropping years
- There is a massive difference in how trays are loaded, drying profit margins could be increased by addressing this issue
- Industry focus should be on marketing and quality assurance
- There was an issue with dirty bins from suppliers
- Fruit held in cool store responded differently, some that had been hydro-cooled softened after 10 days. Some fruit held at 1 C stored for 1 month. Cooling fruit quickly is important. Cost of storage can be high.

Trial reports Anne Mooney , Industry Development Officer I&I NSW

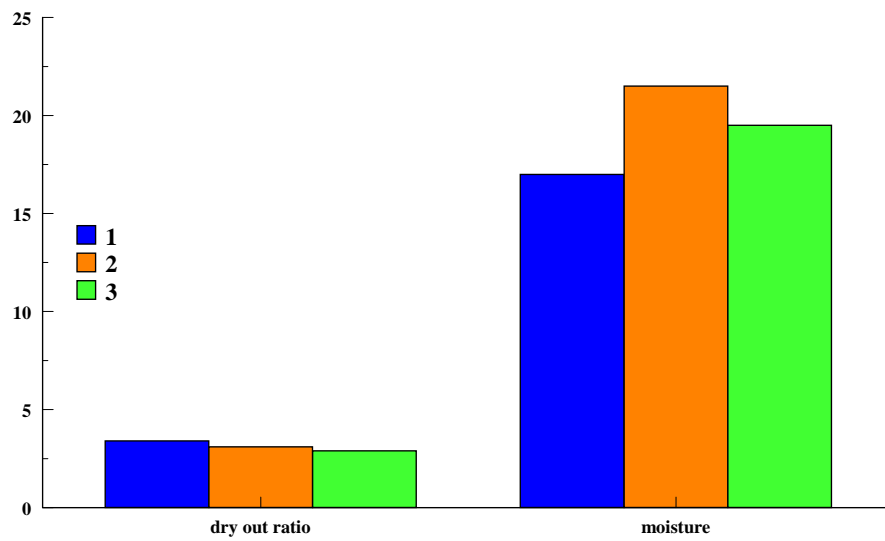
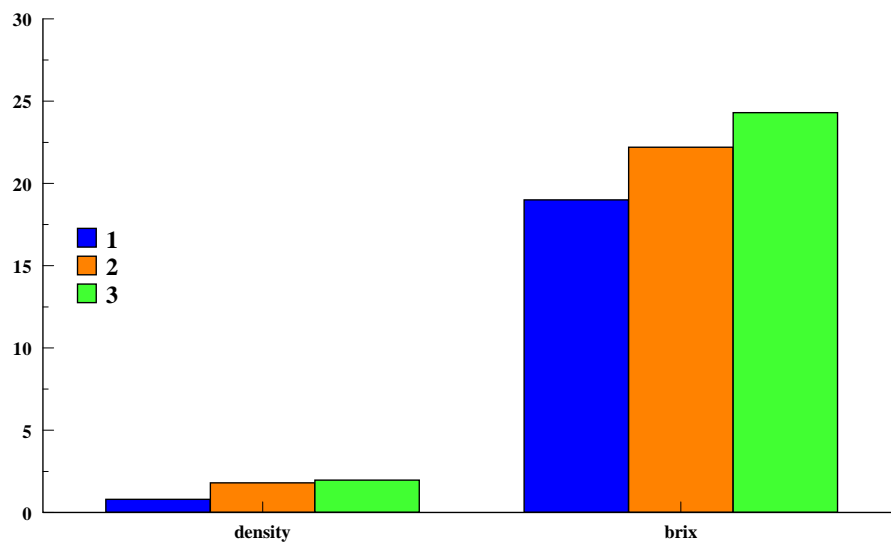
There has been anecdotal evidence that the d'agen clones perform differently and that perhaps there are quality differences.

This season Angas Park had the opportunity to test this idea. Fruit from Darlington Point was harvested separately and shipped to Loxton for drying.



303, 698 and 707 varieties were tested for fruit pressure, soluble solids, moisture content and dry-out ratios.

Results

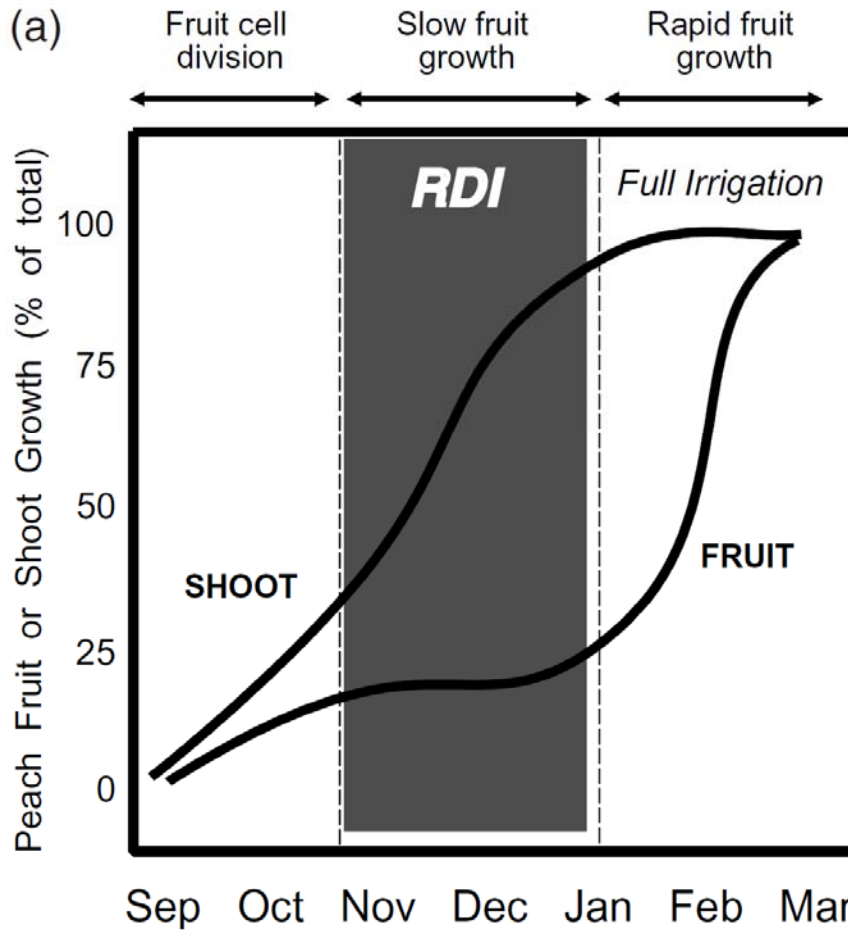


The fruit will pitted separately, so that processing differences can be observed.

Angas Park hope to repeat the experiment over the next two seasons.

Deficit irrigation practice

Typical shoot and fruit growth pattern for (a) peach



- Control irrigation based on available water in the root zone and replacing ETC regularly
- RDI withholds water during stage 2 of shoot growth (shoots are sensitive to water stress)
- PRZI allows drying-side roots to produce hormones that close stomata and reduce ETC

Summary

Reduction in overall water use

- Plant water stress monitoring (orchard variation)
- Managing water stress during blue drop period
- Water application at harvest – size v dehydration
- RDI – need shoot growth pattern, spring soil water
- PRZI – application volume on each side, stomatal conductance
- California trip to study fruit tree irrigation Jul-Aug

Budding and pruning demonstrations were held.

Andrew Creek, District Horticulturist, I&I NSW showed growers budding techniques.



Every grower had different ideas on pruning. Some do minimal pruning, others prune each year. Pruning will make a difference to fruit quality.

Pruning, the basics

1. Pruning is important in maintaining tree vigour, fruit quality, light penetration and reduces crowding
2. Plums fruit on fruiting spurs and one year old laterals
3. Prune in early winter
4. Prune to reduce tree height
5. If hedging, it needs to be followed up by hand pruning
6. Summer prune to remove water shoots and suckers
7. The 4 D's
 - a. Eliminated disease
 - b. Eliminate dead wood
 - c. Eliminate deformed limbs
 - d. Eliminate diagonal limbs