



Department of
Primary Industries

Research update (v1)

Sunmar orchard

- Pruning
- Double planting

NSW DPI Citrus roadshow 2017

Daniel Lazar & John Keam (Sunmar)

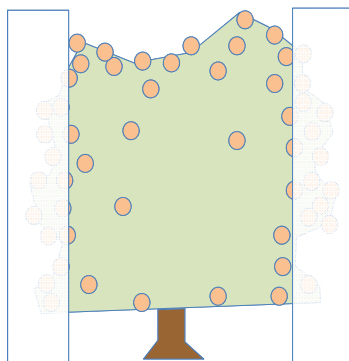
Steven Falivene (NSW DPI)

www.dpi.nsw.gov.au

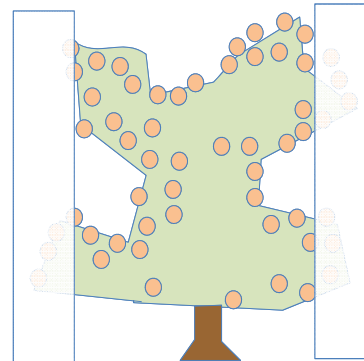
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Pruning

- Increases yield
- Row access: effect of hedging



Majority fruit cut off



Many fruit still inside the tree



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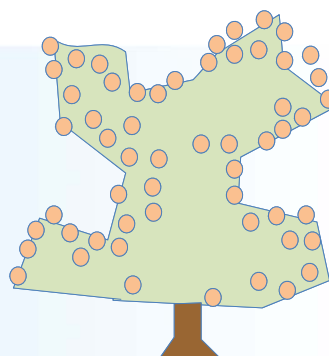
Pruning

- Reduce deadwood & fruit blemish
- Fruit colour
- Disease from deadwood
- Spray penetration
- Less albedo breakdown
- Picker access

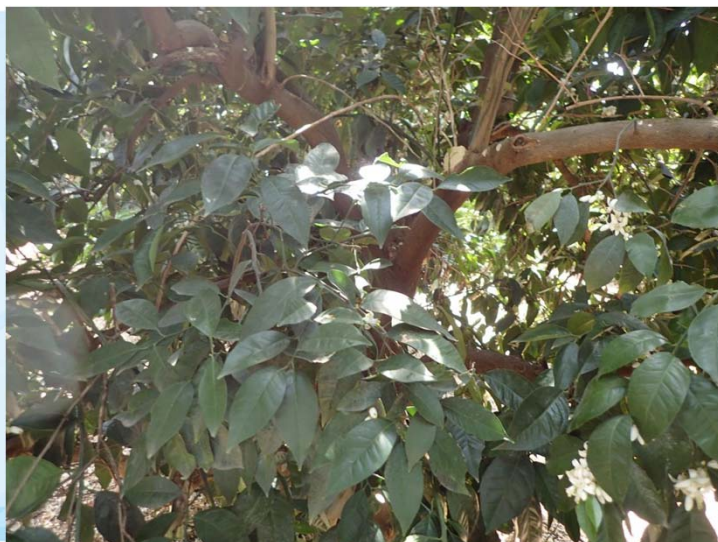


Pruning

- **Need COMMITMENT**
- Start early
 - Yr 1 suckers ,
 - Yr 2-4 tree shaping
 - Yr 5 + opening the canopy



Pruning: internal light



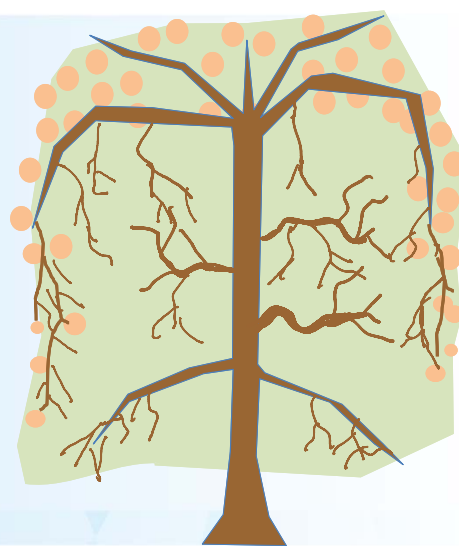
Pruning: Internal growth



Pruning: foliage inside the tree



Pruning: lack of early pruning - umbrella



Pruning: investment

- ANNUAL prune ~ \$1.50 / tree
 - Cost \$800-\$1000/ha = 2t of fruit,
 - Profit = extra 5-10t about \$4200/ha
 - Some blocks 20t/ha extra yield (\$12,000/ha)
- Essential part of management
- Can not afford not to do it

Double planting

Double; 952 trees/ha

Standard; 5.5m x 3.5m = 519 trees/ha



Surface area coverage

72%

62%

Standard planting



Double planting: young trees



Double planting: mature trees



Double planting: pruning

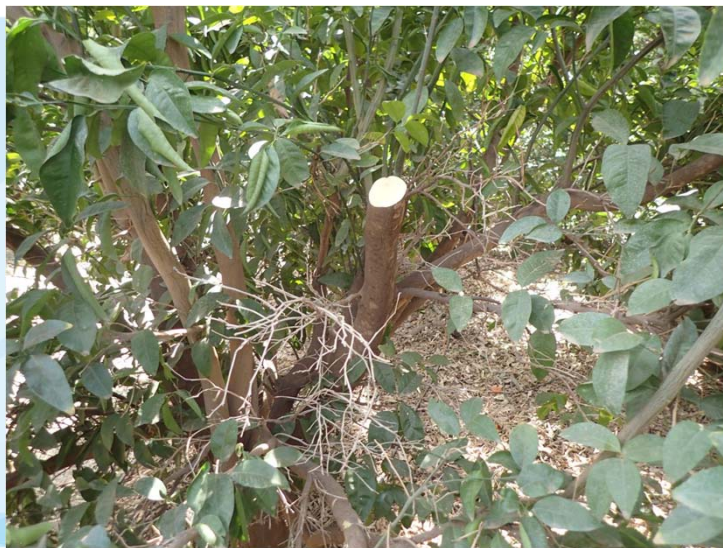
- **CRITICAL:** annual pruning or failure
 - Yield: fruit within the canopy
 - Harvest: picker access



Pruning: Afourer



Pruning: Afourer



Double planting: extra practices

- More young tree weed control
 - + 2x spot spray
- Higher pruning cost
 - 25% less time on smaller double trees but double have more trees = + 25% , + \$250/ha
- Mature trees
 - 25% more herbicide volume
 - 20% extra fertiliser & water
 - Same time to spray
- Total (DPI budget estimate) ~ \$850

Double planting: trunk band spraying

Invented single side
sprayer

- Video on NSW DPI website



Result

- 15% extra yield
- Standard planting: Av. 55t/ha
- Double planting: Av. 63t/ha
- Extra income+ 8 t/ha = \$4800/ha
- Cost ~ \$850/ha
- Net \$3950/ha

Darren Minter pruning video on DPI citrus website



Pruning factsheet in DPI Plant Protection Guide



Citrus plant protection and management guide 2017

NSW DPI MANAGEMENT GUIDE

Steven Falvine and Andrew Creek

www.dpi.nsw.gov.au

Hand pruning citrus

Steven Falvine

Purpose
Optimally sized and unblemished fruit sells for the highest price and consistent yields are essential for long-term profitability. Citrus hand pruning is an essential practice to maintain this quality in high market fruit production. Pruning improves fruit quality by:

- **Consistent yield:** Pruning helps to provide higher and consistent yields (i.e. less alternate bearing).
- **Increased fruit size:** Larger fruit is grown on young vigorous shoots and branches. NSW DPI pruning trials demonstrated an increase in fruit size from the second year after pruning (Falvine & Connolly 2016). Pruning removes a portion of the canopy to make room for new shoot growth. Pruning also induces vigorous regrowth to further prompt new shoot growth. New growth has a greater tendency to produce flowers with many leaves (early inflorescences), which produce larger fruit (Benington et al. 2009).
- **More even fruit colour development:** Pruning allows more light into the tree, improving colour development in internal bearing fruit.
- **Albedo breakdown:** NSW DPI pruning trials were able to demonstrate reduced albedo breakdown (Creek 2013).
- **Reduced red blotch:** Removing excess branches and deadwood means fewer incidences of fruit rotting against dead branches.
- **Reduced disease:** Discarding deadwood significantly reduces the disease spore load within the tree. Opening up trees also creates airflow, allowing the canopy to dry faster after rainfall or overhead irrigation.
- **Improved pest control and bird damage:** Opening up windows in the canopy provides greater penetration and spray coverage. This improves the efficacy of pesticides, and plant growth regulators such as gibberellic acid, that require application on the shaded side of fruit.

Core principles
Hand pruning is a simple exercise to main challenge is timing pruning time to minimise costs while maximising benefits.

- **Prune 20% of the canopy each year:** Research has demonstrated that the positive effect of pruning lasts for about five years (Benington et al. 2009). Maintaining a canopy younger than five years will require about 20% of the canopy to be removed each year. This quantity is only a guide and will differ significantly between trees and seasons.
- **Make larger cuts for efficiency:** Making smaller cuts that target unproductive branches will produce a better result, but can become expensive due to the

extra time. Most growers try to spend no more than 1-2 minutes per annual pruning. This is enough time to make 2-4 reasonably sized branch cuts per head 40 mm or larger, mature trees (Figures 11.2 and 11.3). Find a technique that suits your situation.

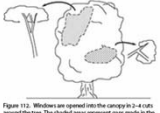


Figure 11.2: Windows are opened into the canopy by 4 cuts around the tree. The shaded areas represent gaps made in the tree from removing a large or mature branch that will allow more light into the tree and encourage new shoot growth.



Figure 11.3: Pruning expert Andrew Connolly demonstrates the gap made by removing a large branch from the tree.

- **Preserve lower limbs:** It is very easy to remove lower limbs because they require less effort. However, the lower parts of the canopy can produce the best quality fruit. Some poorly pruned orchards result in trees shaped like palm trees, with many downward growing branches. These branches are less productive than upward growing branches.
- **Do not prune young trees hard:** A faster-growing canopy will be more productive in the early years. Pruning young trees too hard will suppress the tree's growth. Only make strategic structural shaping cuts and cut out dead wood. The lower limbs will eventually be removed as the tree matures, but until then they can produce fruit (Figure 11.4).

Pruning version: CITRUS PLANT PROTECTION AND MANAGEMENT GUIDE 2017 (4)

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Double row (46t/ha) vs single row (40t/ha) @ \$450/t, cumulative cash flow

No finance



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