SESSION NINE

Session Nine
Fruit size and production

New Zealand and Australia Avocado Grower's Conference'05
20-22 September 2005
Tauranga, New Zealand

Canopy Management

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Reasons for Canopy Management

- Tree size control
- Optimise light interception and penetration
- Improve efficiency of spraying and harvesting
- Rejuvenate tree health and productivity
- Maintain consistent cropping

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Large Trees

Problems with:

- harvesting
- effective spraying
- orchard access

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Orchard Crowding

- reduced light penetration
- large unproductive areas

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Previous work

Effect of pruning and plant growth regulator (Sunny®) application on shoot growth, flowering, yield and fruit quality

Mechanical pruning

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Tree Size and Shape

- Trees pruned to an ‘A’ shape
- Variations in pruning angle (15-20º)
- Height 80% of inter-row spacing (max. 6m)

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Pruning Time

Trees can be pruned

- after harvest/prior to flowering
- during summer (removal of spring growth flush)

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Growth regulators (Sunny®)

Suppress spring growth & Control regrowth

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Pruning & Yield (t/ha)

	Year 1	Year 2	Year 3
Site 1			
Unpruned	23	15	-
Pruned	10	15	-

*In Year 2 Unpruned trees 80cm wider

Site 2			
Unpruned	25	21	26
Pruned	17	12	26

*In Year 3 Unpruned trees 1m wider

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Pruning & Fruit Position

	% of Fruit (0-2m)	
	Year 2	Year 3
Unpruned	29%	12%
Pruned	42%	21%

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Pruning & Fruit Quality
(Incidence - % of fruit affected)

	Year 1	Year 2
Unpruned	5.8b	6.7a
Pruned	40.6a	3.3a

Diffuse discolouration

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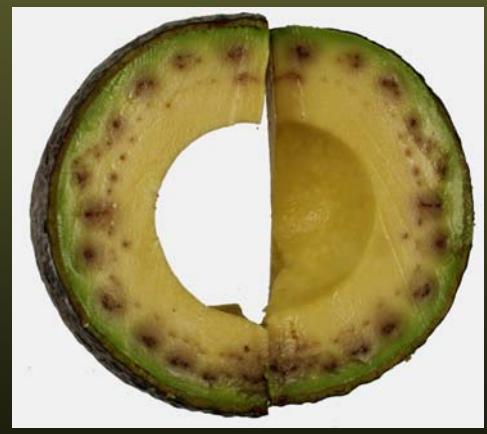
Pruning & Fruit Ca

	Ca %	Severity (% of flesh affected) Stem-end rots	Vascular browning
Unpruned	0.060a	0.1b	0.3b
Pruned	0.046b	0.6a	0.8a



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Timing of Post-Harvest Prune

	Growth at harvest (cm)	Yield (t/ha)	Body rots (% of fruit affected)
Unpruned	17b	26a	8c
Pruned after harvest (17th June)	31a	18b	41a
Pruned 1 month later (11th July)	22b	20b	28b
Pruned 2 months later (13th August)	20b	20b	19bc

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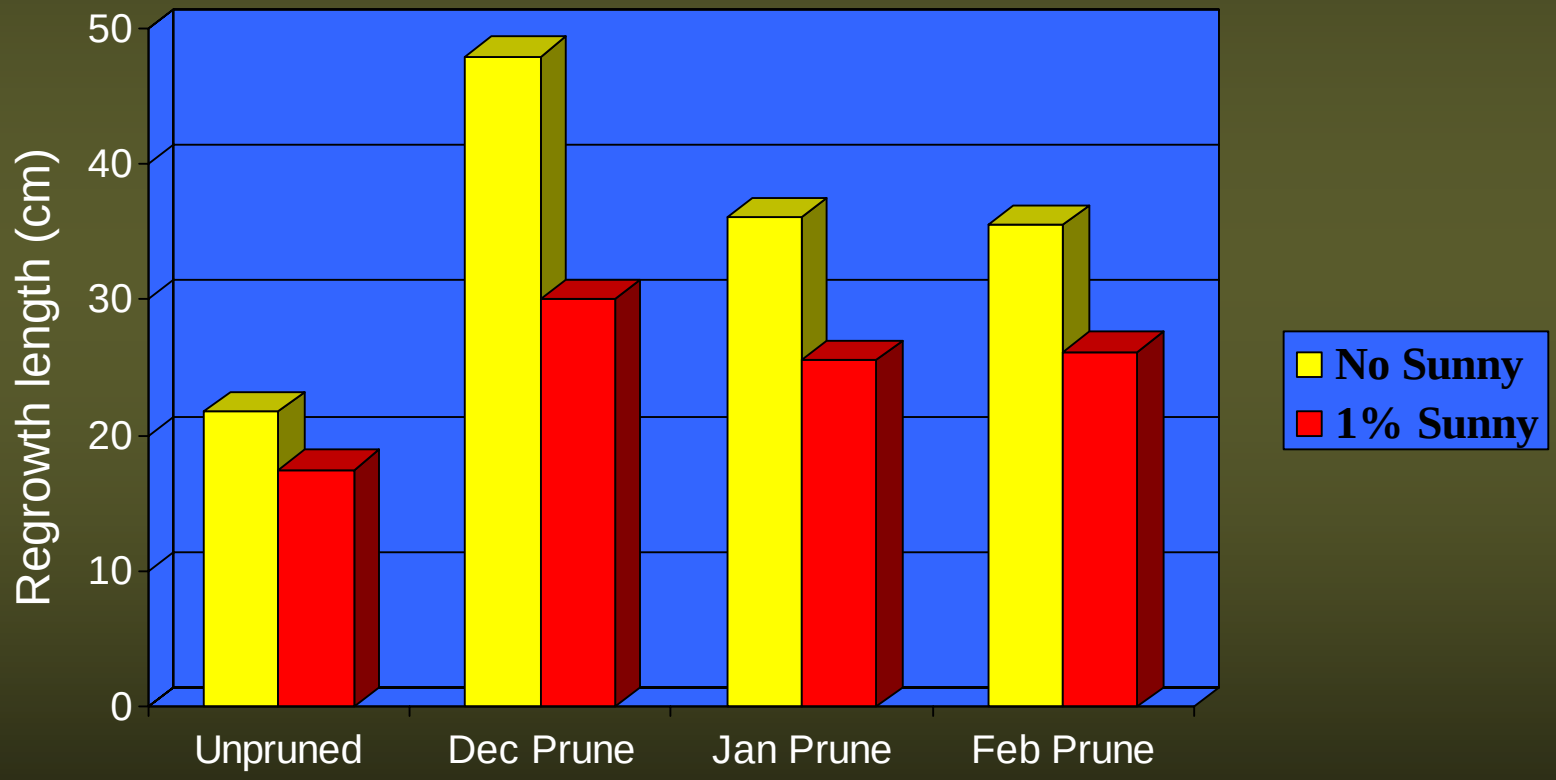
Summer Pruning & Sunny®

(Regrowth length)



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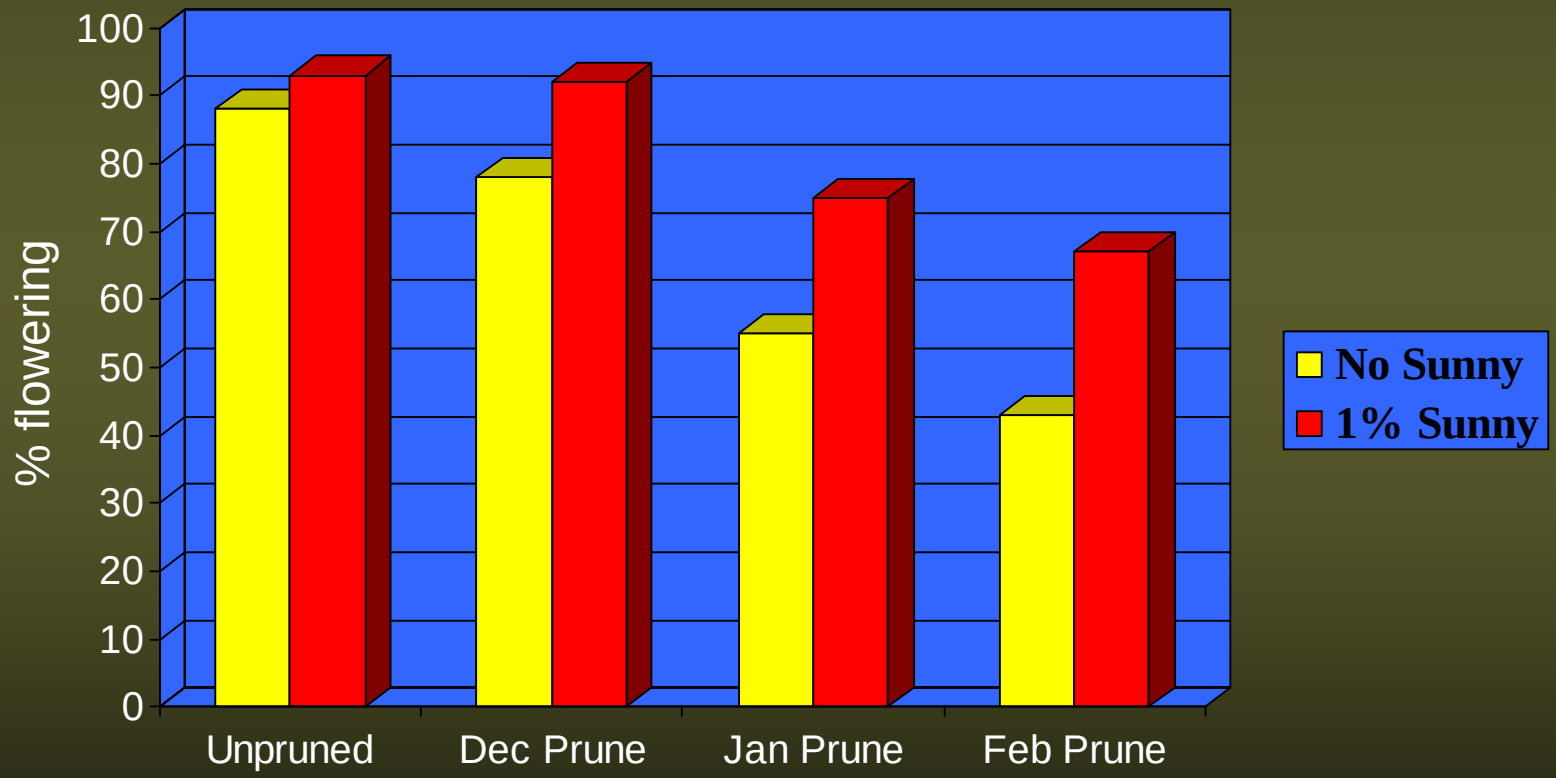
Summer Pruning & Sunny®

(Regrowth flowering)



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Other PGRs

Reduce regrowth in pruned trees

NAA (naphthalene acetic acid)

- In California 1% formulation + paint controlled regrowth up to 18 months

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NAA: Small branches (2 cm)

	No. of shoots (0-20 cm)	No. of shoots (below 20 cm)
Untreated	3.4	0
NAA 0.5%	0.1	2.3
NAA 1%	0	2.2

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NAA: Large branches (10 cm)

	No. of shoots (0-20cm)	No. of shoots (below 20cm)
Untreated	4.9	0
NAA 0.5%	0.9	3.9
NAA 1%	0.2	2.3

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Other PGRs

Prohexadione-Ca (Apogee® or Regalis®)

- Inhibitor of GA biosynthesis
- In Chile foliar spray at mid-bloom (1.25g/l) ↑ yield by 7 t/ha

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Previous work - Outcomes

- Pruning can stimulate growth
- Pruning reduced yield in first year
- Timing of post-harvest prune
  - Minimise regrowth during fruit set
  - Regrowth can affect fruit quality
- Timing of summer prune
  - Regrowth flowering
- Sunny® reduced regrowth & increased flowering
- Results from warm subtropical sites

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Previous work

Analysis of Canopy Management options for use in Avocados

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Previous work - Outcomes

- Identified several CM systems
- Developed a method to compare CM systems
  - Productivity ratings (t/ha/year)
  - CM costs ($/ha/year)
- Identified need for further evaluation

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Development of canopy management practices to suit the different growing environments across Australia

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Canopy Management Strategies

- Selective limb removal
- Mechanical /hedge-row pruning
- Stag-horning/stumping
- Tree removal (orchard thinning/block recycling)
- Top-working
- Cincturing/girdling
- Plant growth regulators

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Selection of Orchards/Growers

- Sites identified from the Avocado CM review
- Meetings with growers
- 3-5 growers from each of the major production areas (N Qld, Central Qld, S Qld/Northern NSW, Sunraysia & WA)

Evaluation of CM Systems

- Growers to perform & record operations (timing & cost)
- Report timing of events (flowering, flushing, harvest)
- Collect information on tree size, yield and fruit quality
- Provide history of CM operations

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Identify best CM Systems

- Analyse in terms:
  - Productivity (t/ha/year)
  - Fruit size (pack-outs)
  - Fruit quality (reject %'s)
  - CM costs ($/ha/year)
- Determine suitability in terms of cost/benefit to the grower

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Uptake of Results

- Meetings with growers to evaluate success of each CM system
- Sites selected to be used as demonstration blocks during field days


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