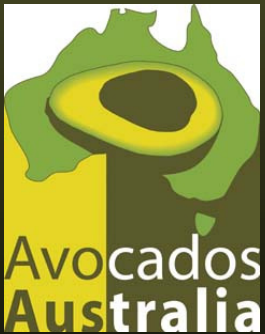


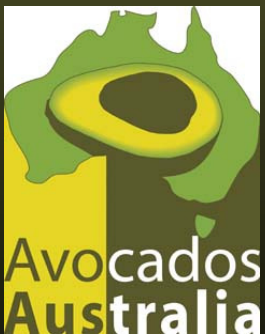
# Can Canopy Management Strategies Overcome Alternate Bearing?



# The Problem

‘On’ year – intense flowering in the spring resulting in a heavy crop

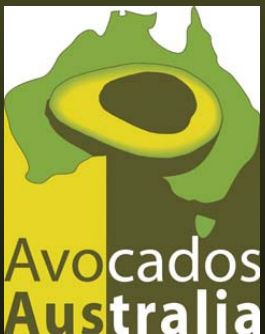
- large number of small fruit
- more sunburnt fruit
- reduced vegetative growth in spring & summer



# The Problem

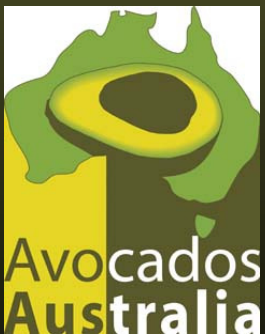
Followed by an 'Off' year – a light flowering resulting in a light crop

- small number of larger fruit
- increase in spring & summer growth



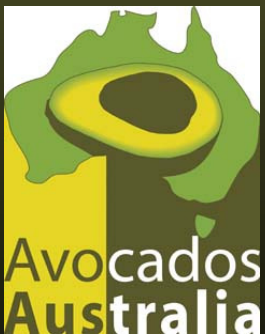
# Management Strategies

- Pruning
- Flower pruning
- Fruit thinning
- Cincturing/scoring
- Plant growth regulators



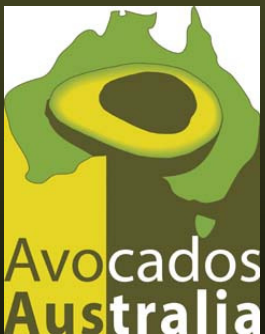
# Pruning Objectives

- tree size control
- improve light interception and penetration
- improve efficiency of harvesting & spraying
- maintain yields and fruit quality

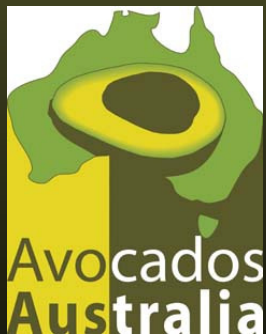


# Pruning Objectives

- to avoid AB pattern – create a balance between vegetative and reproductive growth (start on young trees)
- if AB develops:
  - reduce flowering sites in an 'on' year
  - increase flowering sites in an 'off' year



How can this be achieved?





# Selective Branch/Limb Removal



5 year old



15 year old



# Major Limb Removal



Older trees >15 yr



# Mechanical Pruning



Tip pruning in young trees



Major pruning in older trees

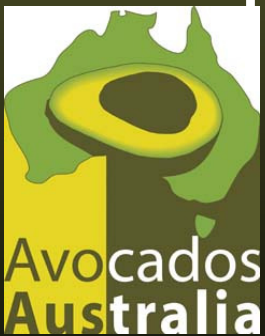


# Staghorning/Stumping



# When to Prune?

- late autumn and through winter
- warm subtropical climates - after harvest prior to next season's flowering
- in cooler temperate climates – (flower and fruit present on the tree) prune when trees carrying a light crop prior to an 'on' flowering



# Pruning Time (Shepard – NQld)

Treatment	Growth at harvest (cm)	Yield (t/ha)
Unpruned	45	6.4
Pruned after harvest (28 <sup>th</sup> March)	81	2.9
Pruned 2 months later (3 <sup>rd</sup> June)	66	6.9





# Pruning Time

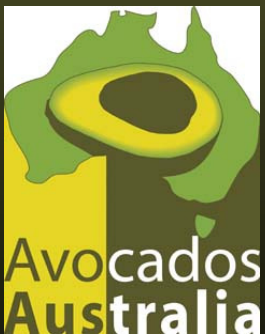


- young trees tip pruned in May
- flowers developed below the cut on small branches



# How Much to Prune?

- prune enough to allow good light penetration into the canopy
- also reduce tree height, improving picker access & spray penetration
- eg. selective limb removal (25-35% canopy removed)



# Regrowth Management



Trees pruned after harvest



Regrowth tip pruned in summer

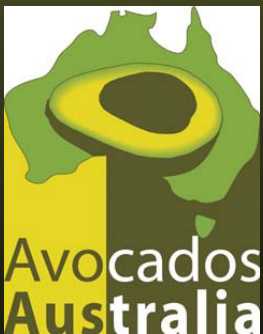
# Flower Pruning Objectives

- to reduce flowering & fruiting in an “on” year
- to create sites for flowering the following “off” year
- trying to avoid years of excessive flowering with minimal spring flush



# Flower Pruning

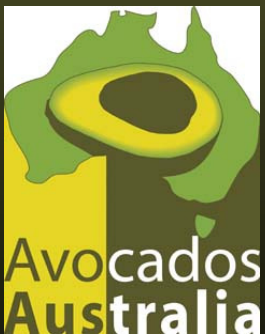
- in late autumn & winter prior to the “on” flowering
- 20-30% of the terminals removed
- avoid excessive regrowth at the time of fruit set – competition for resources





# Fruit Thinning Objectives

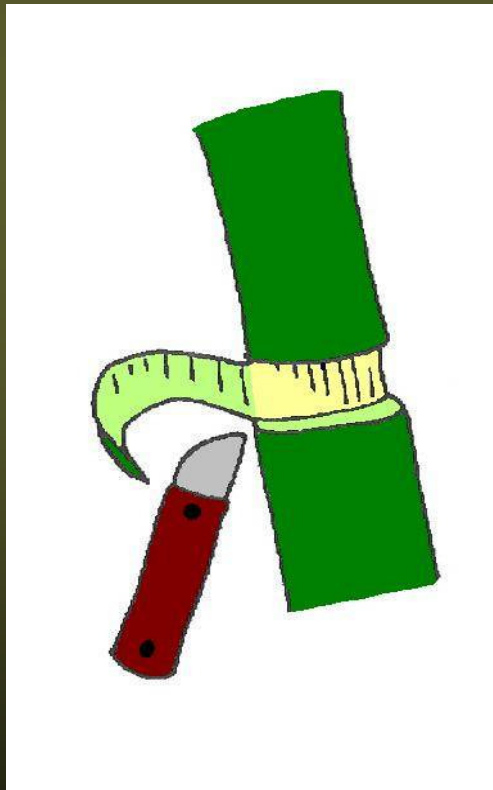
- to reduce amount of fruit in an “on” year
- by reducing the crop load create sites for flowering the following “off” year
- timing – early fruit set. If too late no effect on next year’s flowering



# Cincturing/Scoring

Cincturing – removal of a strip of bark (10 mm)

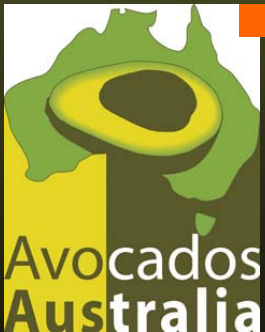
Scoring – single knife/saw cut around the branch





# Cincturing/Scoring Objectives

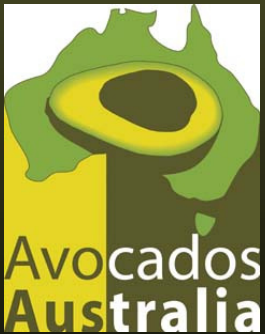
- get a build up of carbohydrates above the cut
- an increase flowering & fruit set
- used to get a 'final' crop before branch or tree removal
- to get vigorous trees cropping
- timing – autumn



# Cincturing/Scoring Outcomes

Scored Branch  
77 fruit – 265g

Non-Scored Branch  
30 fruit – 275g



# Plant Growth Regulators (eg. Sunny<sup>®</sup>)



- applied at flowering to reduce spring growth flush & increase fruit size

- applied to regrowth following pruning to reduce shoot growth & increase flowering





# Stumping & Sunny<sup>®</sup> Trials



- trees were stumped after harvest (June)
- regrowth sprayed with Sunny<sup>®</sup> in January & April
- effect of treatment on shoot growth, flowering & yield

# Stumping & Sunny® Results

Treatment	Shoot growth (cm)	% shoots flowering	Yield (kg/tree)
Untreated	107	76	3.0
1% Sunny in January	81	94	12.5
1% Sunny in April	84	100	12.2
1% Sunny in Jan/April	71	100	13.0



# Acknowledgements

This project was funded by grower R&D levies and matched by Horticulture Australia



*Know-how for Horticulture™*