

Tree Structure

The program

This program aims to produce management strategies with tools and systems for manipulating tree structure that can be used to optimise orchard productivity.

The program is now in its final year. Fruiting efficiency on different bud types was examined in year 1. Years 2-5 compared precision-managed and conventionally-managed trees with equivalent crop loads.

Apple varieties investigated in this program are *Royal Gala* and *Pink Lady* (Huon Valley, Tas; Stanthorpe, Qld; Lenswood, SA (year 1 only); and Shepparton, Vic) and *RS103-130* in Queensland.

Precision management (ASE) versus conventional management

Artificial Spur Extinction (ASE) is a crop load management method that uses manual bud thinning techniques to precisely define where and how much fruit is set on the tree. The aim of ASE is to achieve accurate, predictable crop load and promote the vigour and performance of floral spurs, stimulate spur strength and improve fruit quality and regularity of production. This is done by selectively removing floral spurs from dormant branches to achieve a set density of high quality spurs.

At bud burst, ASE trees will be carrying fewer but stronger flower buds than a conventional tree. Hence trees can direct more resources into these buds, potentially carrying a more optimum crop load of quality fruit for the tree size and structure.

Once set up, ASE orchards should require less annual maintenance of vegetative growth and produce more consistent fruit set each year.

Floral bud type and fruit quality

Results to date have clearly demonstrated that not all flower buds are equal when it comes to fruit size. Axillary flower buds (on 1st year wood) always produce smaller fruit. In *Pink Lady*, fruit size was greatest on terminal buds across all regions. In *Royal Gala*, no difference in fruit size was noted between spurs and terminals in South Australia but in Tasmania and Queensland, terminal floral buds produced bigger fruit than spurs.

The greater fruit size potential of terminal floral buds appears to be associated with a greater leaf area and photosynthetic potential.

Influence of tree structure on fruit set

We have now had three seasons of the ASE cropping management. Return bloom was adequate to provide full crop load potential even though chemical thinning was avoided in these trees.

Key Messages

- ASE treatment increased fruit set in individual floral buds, being most pronounced at lower floral bud densities.
- The number of spurs not setting any fruit was reduced to less than 10%, and the number of doubles and triples increased.
- Precise methods of crop load regulation imposed early in the season can reliably achieve the yield and fruit quality results planned for.

Research Team

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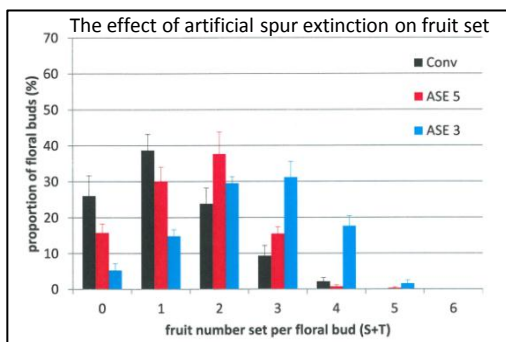
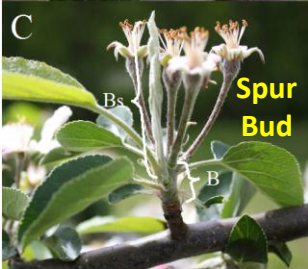
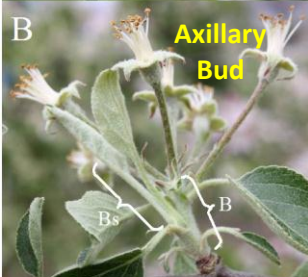
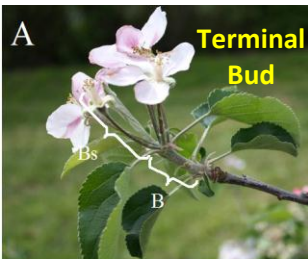
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