

## Future Orchards Demonstration: Final Report

<b>Project title:</b>	Bud Dissection To Determine Fruitfulness
<b>Region:</b>	Manjimup WA
<b>Contact:</b>	Susie Murphy White
<b>Projective Objective:</b>	What proportion of Bravo buds were floral? Is the bud vegetative or floral to determine pruning requirements?

<b>Outline/method/ (what we did):</b>	<ol style="list-style-type: none"> <li>1. Sample 50-100 buds from the Bravo block on the Manjimup Research Station.</li> <li>2. Selected 5 spurs per tree, 10 trees randomly selected across the block</li> <li>3. Only selected buds that could be floral spur and terminal (i.e. avoid the very small narrow shaped buds, these are typically 5-10% of the population)</li> <li>4. Counted the number of buds per spur, didn't count the small arrow shaped buds</li> <li>5. Only sample spur buds, don't sample terminal or lateral buds</li> <li>6. Longitudinal cut bud using a razor blade and tweezers</li> <li>7. View under microscope at 40x to determine if floral or vegetative</li> </ol>
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### Results

Orchard	Manjimup Horticulture Research station 28527 South West Highway Manjimup WA
Variety	Bravo ANBP 01
Block	5 Year old block of Bravo trees
Is the block biennial (yes/no)	No
Was last year's crop 2020 (heavy, light or optimum)	Optimum
This year's crop 2021 (heavy, light or optimum)	Heavy
Any stress last year that might impact fruitfulness	No

Apple trees generally produce more flowers than are required to achieve good yields. Buds are initiated in the growing season prior to dormant pruning, and conditions in the previous season can determine whether a flower bud develops, or not.

After dry seasonal conditions in Stanthorpe Queensland and Orange NSW last year it was timely to look at bud fruitfulness for the upcoming apple crop across all regions. In WA the flower bud identification was undertaken in mid-winter on a Bravo block at the Manjimup research station.



*Figure 1. Bravo bud in the orchard.*

Dormant wood was collected from 10 ten trees in mid-August 2020. In the laboratory, buds from three sources (terminal, 1-year-old wood and spur wood) were dissected with razor blades and examined under a 40 X stereo binocular microscope to determine if they contained developing flowers or vegetative primordia.



*Figure 2. Dormant wood collected for bud dissection.*

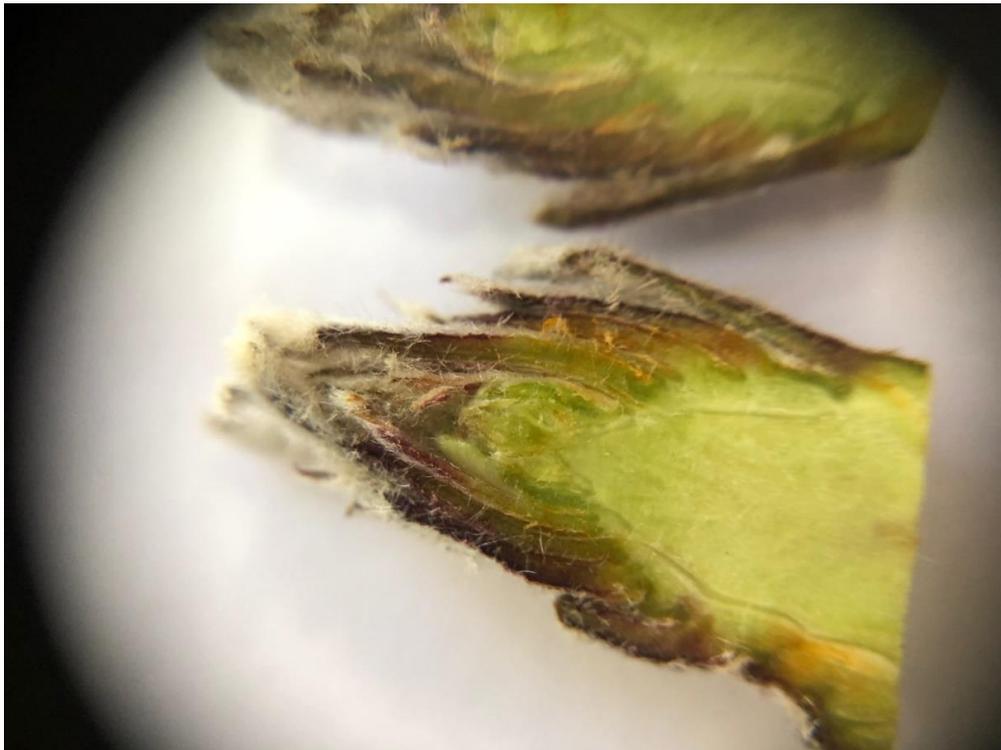


Figure 3. Floral Bravo bud in mid-winter.

Knowing what proportion of buds contain flower or vegetative (leaf) parts can help growers plan how to prune and achieve the desired crop load. Bud dissection, using a sharp blade to slice the buds and expose flower parts, can be used to determine if buds are floral or vegetative. Fruitful buds will have distinct flower parts by midwinter (Figure 3).

Recommendations from AgFirst is “that a normal floral percentage is likely to be 70–90 per cent depending on the variety, and anything below 70 per cent might require pruning adjustment. If below 50 per cent it may be prudent to prune when flowers are visible.” The results from the Manjimup Bravo trees which had not been under any stresses in the previous season showed a normal floral percentage of 76 per cent. This year’s crop is heavy with an above average yield expected.

Table 1. Bravo Bud Fruitfulness

<b>Total Buds</b>	<b>178</b>
<b>Total Floral Buds</b>	135
<b>Percentage Floral</b>	76%

### Implications

Based on one season’s data, growers can expect bud fruitfulness (assessed by dissection in winter) to correlate to bloom potential in spring. If blocks have a low proportion of floral buds, then pruning

can be altered to increase the number of flowers on trees. Increased flower numbers should increase cropping potential.