

Post-Harvest Deficit Irrigation in Peach and Pear

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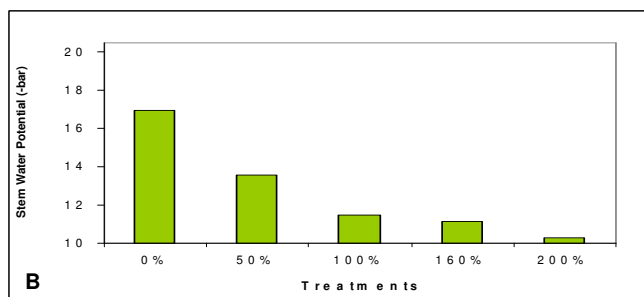
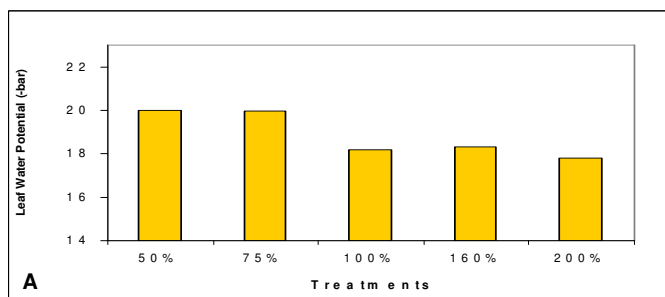
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Maximising water use efficiency is a major priority for Goulburn Valley irrigators. Reducing post-harvest irrigation could save significant amounts of water, given that post-harvest crop evapotranspiration for mid-season harvested peaches and pears is approximately 40 % of the season total. This trial aimed to measure the effects of post-harvest irrigation deficits on tree water stress and bud development for T204 peaches and Williams Bon Chretien (WBC) pears.

Method:

- Irrigation treatments for peach and pear were 50, 75, 100, 160 and 200 % and 0, 50, 100, 160 and 200 % of normal grower irrigation, respectively, implemented immediately after harvest in 2008.
- Each treatment was replicated 4 times in a randomised block design, with buffer trees and rows to isolate 2-tree experimental plots.
- Stem and leaf water potential was measured weekly from harvest to leaf fall as an indicator of tree stress.
- After leaf-fall, pruning samples were taken and an assessment of bud number and bud dry weight was completed.

Results:



Figures A and B: Average leaf water potential for T204 peach (A) and stem water potential for WBC pear (B) from February to April

➤ Leaf and stem water potential was significantly more negative for the two highest deficit treatments than for the other treatments on 58 % of sampling occasions for peaches ($P \leq 0.05$) and 82 % of sampling occasions for pears ($P \leq 0.001$).

Table A and B: Average bud number per lateral for T204 peach (A) and bud dry weight for T204 peach (A) and WBC pear (B)

Treatment	Flower Bud			Vegetative Bud	
	No. Doubles per Lateral	No. Triples per Lateral	Dry Weight per bud (mg)	No. per Lateral	Dry Weight per bud (mg)
50%	11.6	1.0b	14.3	23.3	5.1
75%	10.7	3.2ab	14.1	19.9	4.9
100%	11.6	2.7ab	13.9	21.5	5.0
160%	10.7	5.0a	14.0	18.9	5.0
200%	9.8	4.6a	15.2	18.8	4.9
P	0.500	0.018	0.369	0.182	0.992
I.s.d. (P=0.05)	NS	2.3	NS	NS	NS

Treatment	Flower Bud	Vegetative Bud
	Dry Weight per bud (mg)	Dry Weight per bud (mg)
0%	36.7	2.7
50%	28.0	2.6
100%	26.0	2.9
160%	31.1	3.1
200%	27.7	2.3
P	0.797	0.396
I.s.d. (P=0.05)	NS	NS

➤ There was no difference between treatments in flower or vegetative bud dry weight. Triple flower bud number per lateral for peaches was lowest in the highest deficit treatment.

Ongoing Work:

Irrigation will return to normal grower practice during the forthcoming growing season. The effects of post-harvest water deficit on tree productivity and fruit quality will be determined next season, with tree stress monitored during the season, and yield and fruit size measured at harvest 2009.