

Future Orchards Final Report

Project title:	Pollination under nets
Region:	South West WA
Contact:	Susie Murphy White
Projective Objective:	To compare the pollination rate of a netted Kanzi (2015) block with the no net young Kanzi (2016) block.

Outline:	<p>To compare the pollination rate of 5 trees to be selected from under the net and 5 from outside the net along one row.</p> <p>At full bloom during midday;</p> <ol style="list-style-type: none"> 1. Count the number of open flower clusters on the selected 5 trees to estimate the percentage full bloom. 2. Randomly select 3 flower clusters on each of the 5 trees. 3. Then to observe and record insects visiting open apple flowers; <ol style="list-style-type: none"> a. Record the start time. b. Allocate 1 minute observation for each of 3 clusters of flowers on the 5 selected trees. c. Identify or collect visiting insects if unknown. d. Document the end time. 4. Record temperature wind and cloud cover. <p>At approximately 1 week before picking;</p> <ol style="list-style-type: none"> 5. Count number of fruit on each of the 5 selected trees. 6. Take a sample of 10 fruit from 5 trees each tree and cut in half and count the number of seeds per fruit. <p>Record placement and number of bee hives in orchard.</p>
-----------------	--

Milestones	Planned Date
Trial defined	June 2018
Trial setup	September 2018
Records Measurement 1 - % bloom & visits/minute	October 2018
Records Measurement 2 - seeds per fruit	March 2019
Field day	November 2019
Reporting	June 2019
Presentation growers	November 2019

MAP & Layout: Fox Road Pemberton -34.407029, 116.081109

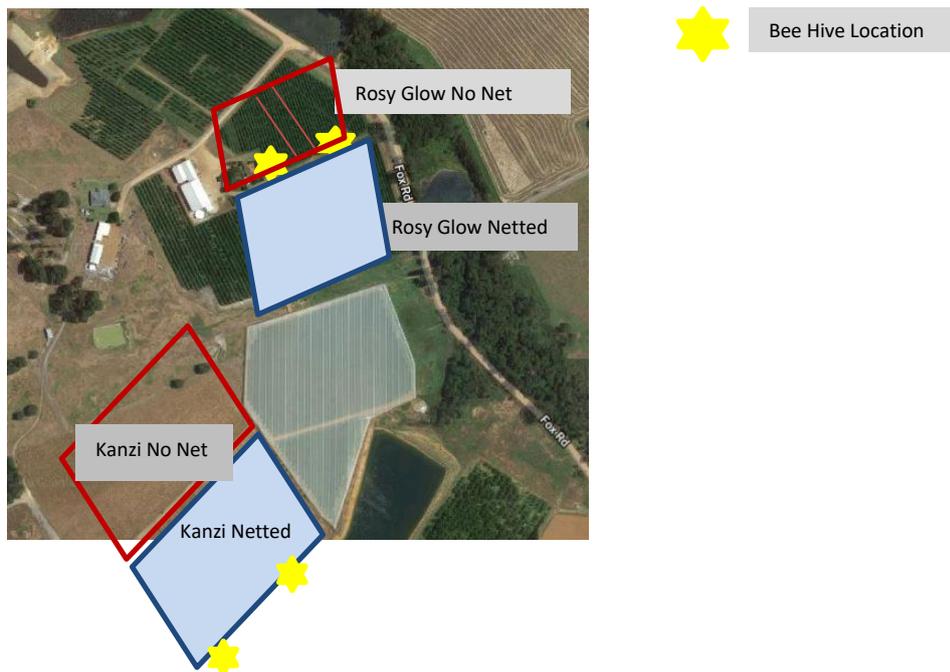


Figure 1. Location of blocks and bee hives.

Results

The hives were placed at the end of the rows between the netted and no net in the Rosy Glow and the hives were placed at the end of the netted area for the Kanzi (figure 1). This was approximately one week before (11/10/2018) the monitoring of the pollinators. The Kanzi were at 80% full bloom on (17/10/2018) and the Rosy Glow was at 60% bloom. Both the Kanzi block and Rosy Glow blocks were monitored for pollinator visits on a clear sunny day at midday on 17/10/2018.

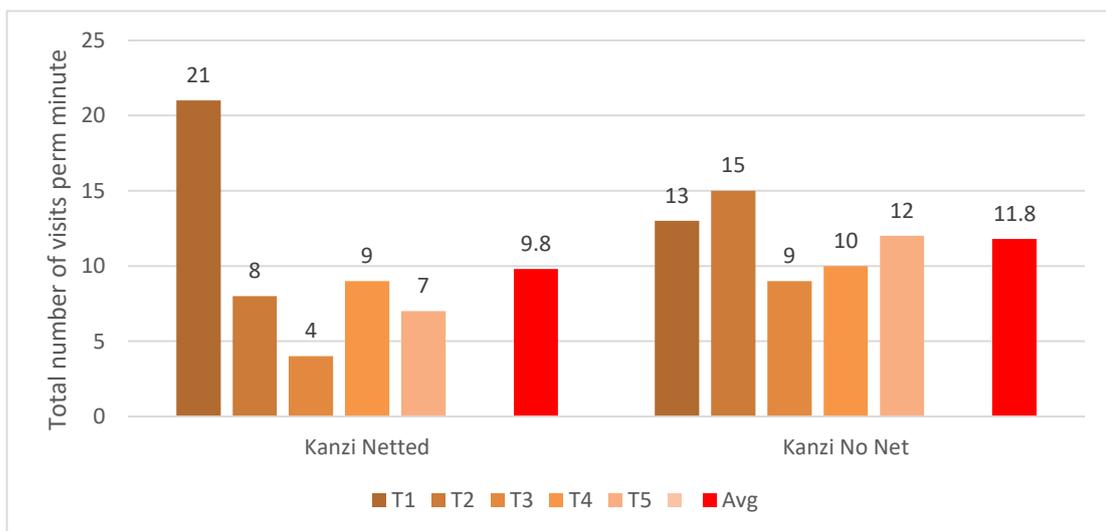


Figure 2. Pollinator visits in the netted and no net Kanzi block at 80% full bloom (17/10/2018).

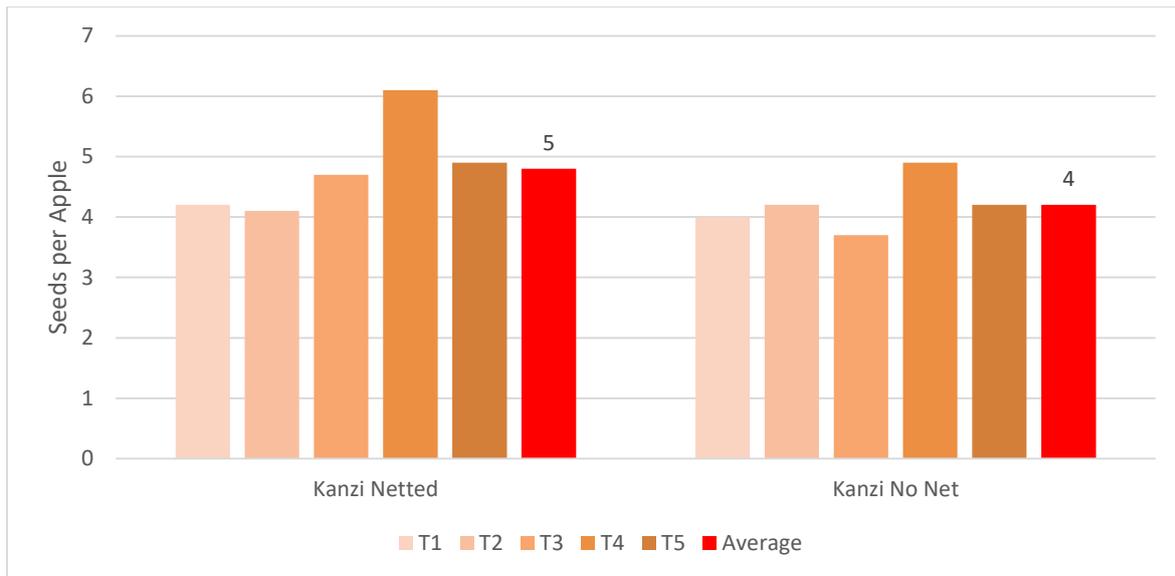


Figure 3. Seeds per apple in the netted and no net Kanzi block.



Figure 4. Kanzi under nets at full bloom (17/10/2018) and at harvest (26/3/2019).



Figure 5. Kanzi no net at full bloom (17/10/2018) and at harvest (26/30/2019).

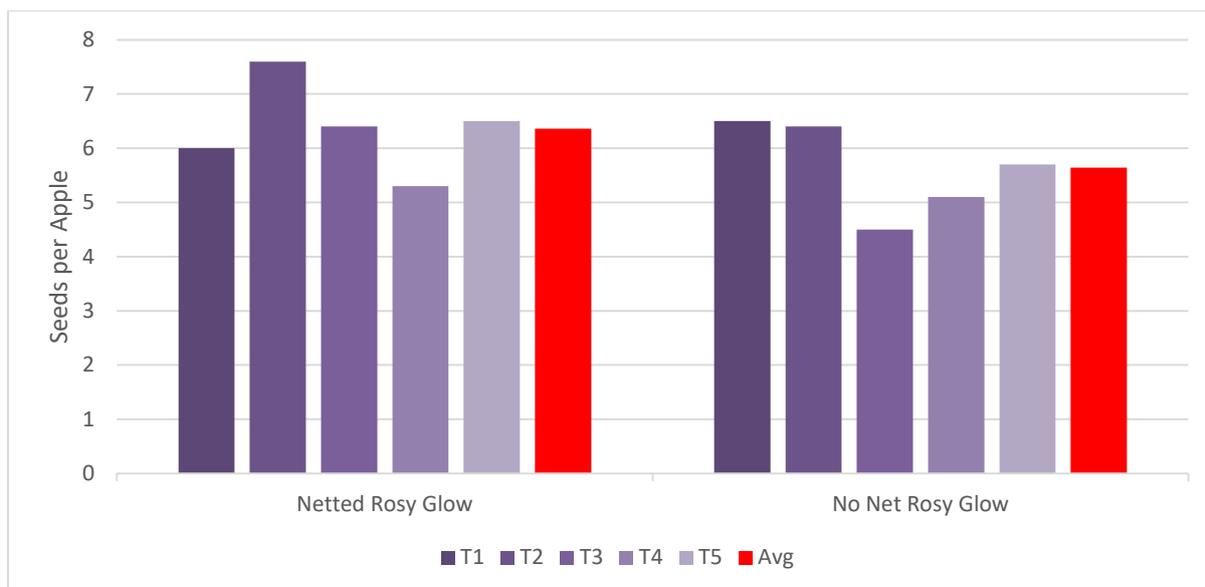


Figure 6. Seeds per apple in the netted and no net Rosy Glow block.

As there was very little difference in the average number of seeds in the netted and no net Kanzi blocks (figure 3), a sample from the Rosy Glow blocks in the middle of the row was picked and the seeds counted (figure 6). This also showed no difference between the netted and no net blocks.

Table 1. Average seeds per apple of the Kanzi and Rosy Glow netted and no net blocks.

Block	Average Seeds per Apple
Kanzi Netted (2015)	5
Kanzi No Net (2016)	4
Rosy Glow Netted	6
Rosy Glow No Net	6

Implications

The pollination under the nets was very good, both blocks Kanzi and Rosy Glow netted and no net showed no difference in the number of seeds per apple. The pollinator activity at flowering was higher outside the net as the insects found the conditions more favourable. But the end result of the number of seeds per apple showed no difference.

Setting fruit can be very important as without pollination, flowers abort. The issue comes from too much pollination and too many seeds which appear to make the trees go biennial if crop load isn't reduced quickly after fruit set.

References

- Mark Goodwin (2012) Pollination of Crops in Australia and New Zealand. Rural Industries Research and Development Corporation Publication No. 12/059
- Romina Radar 2018. Pollination of Apple flowers: How many visits are needed to produce fruit? University of New England. APAL Speed Updating
- Evans LJ, Cutting BT, Jochym M, et al. Netted crop covers reduce honeybee foraging activity and colony strength in a mass flowering crop. *Ecol Evol.* 2019;00:1–12.
<https://doi.org/10.1002/ece3.5154>