Preliminary Trial Results 2015/16

The Wrangler Ltd
21 Mill Road, Whakatane NZ
p. 0800 466 837
+64 7 308 8703
info@thewrangler.co.nz
www.pollensmart.co.nz

Trial Summary

Trials were set up on 4 Eastern Bay of Plenty Hayward orchards during the 2015/2016 growing season. Within each trial 100 flowers of each treatment were tagged and were collected and weighed just prior to harvest.

The trials were designed to compare different pollen application rates and pollinators with flowers pollinated by bees only and flowers which had been perfectly pollinated (one male flower applied to a female flower). Trial fruit were picked late April to early May 2016 and the pollination success was assessed by % fruit loss, fruit weights and seed counts.*
** Note: Seed counts for these fruit are still underway with the help of Zespri endorsed methodology.*

We have nearly completed collating the seed counts for all trial fruit but have drawn the following conclusions based on % fruit loss and the fresh weights of the trial fruit:

- On an orchard with poor males and low bee activity there was a significant improvement in fruit size and yield even after one pass with the PollenSmart pollinator at 99% flowering (Two trials: 100 g pollen/ha and 300g pollen/ha pollen).
- One orchard had an over-supply of male flowers and very good bee activity yet it showed that yield and average fruit weights improved when pollinated with PollenSmart at 100 g pollen/ha and 250 g/ha. Both these PollenSmart application rates achieved the average fruit weight of perfectly pollinated flowers.
- Pollination with the PollenSmart pollinator resulted in higher average fruit weight than when pollen was applied with a hand blower (both trials at 250 g pollen/ha).
- Where Psa caused bud rot in males flowers, three PollenSmart pollen applications of 120 g/ha resulted in a higher average fruit weight than 'perfect pollination' (where the orchard's own male flowers were used to pollinate the female flowers).
- Three applications of 120 g pollen/ha resulted in higher average fruit weights and improved yield than two applications of 300 g pollen/ha.

- Pollen is very expensive and therefore it makes sense to be as least wasteful as possible when artificially pollinating.

- The PollenSmart pollinator has multiple pollen blowers. 'Unused' pollen is drawn back into the pollinator to be re-blown hence decreasing pollen wastage.

Trial Results

To create the tables below, we have taken into account % yield and the average fruit weights for each treatment and then standardised the crop volumes to a hypothetical 50 flowers/m². The average tray weight is 3.51 kg and allowing a 4% reject rate, we have calculated the trays/m². The OGR calculation is based on $5.00 per tray.

Orchard R

	High rate (300g/ha)		
	Bees only	PollenSmart	Perfect pollination
Trays/m²	0.06	0.96	1.61
$/ha	$3,000	$48,000	$80,500
	Low rate (100g/ha)		
	Bees only	PollenSmart	Perfect pollination
Trays/m²	0.28	0.82	1.64
$/ha	$14,000	$41,000	$82,000

- 5.6 hives/ha
- Very few bees working in orchard
- Male flowers almost non-existent
- One PollenSmart application (two rates) at 99% flowering.
- The low rate was applied in the morning, the high rate in the afternoon (windy)

Orchard P

	High rate (300g/ha), 2 pollen applications		
	Bees only	PollenSmart	Perfect pollination
Trays/m²	0.56	1.4	1.43
$/ha	$28,000	$70,000	$71,500
	Low rate (120g/ha), 3 pollen applications		
	Bees only	PollenSmart	Perfect pollination
Trays/m²	0.74	1.61	1.6
$/ha	$37,000	$80,500	$80,000

- 8 hives/ha
- Excellent bee activity (up to 20 bees a bay)
- Moderate quantity of male flowers
- Psa bud rot in the males

Orchard A

		Low rate (100g/ha)	High rate (250g/ha)	
	Bees only	PollenSmart	PollenSmart	Perfect pollination
Trays/m²	1.42	1.59	1.64	1.64
$/ha	$71,000	$79,500	$82,000	$82,000

- 4.4 hives/ha
- Excellent bee activity including native bees
- Overabundance of male flowers (3m strip males)

Orchard S

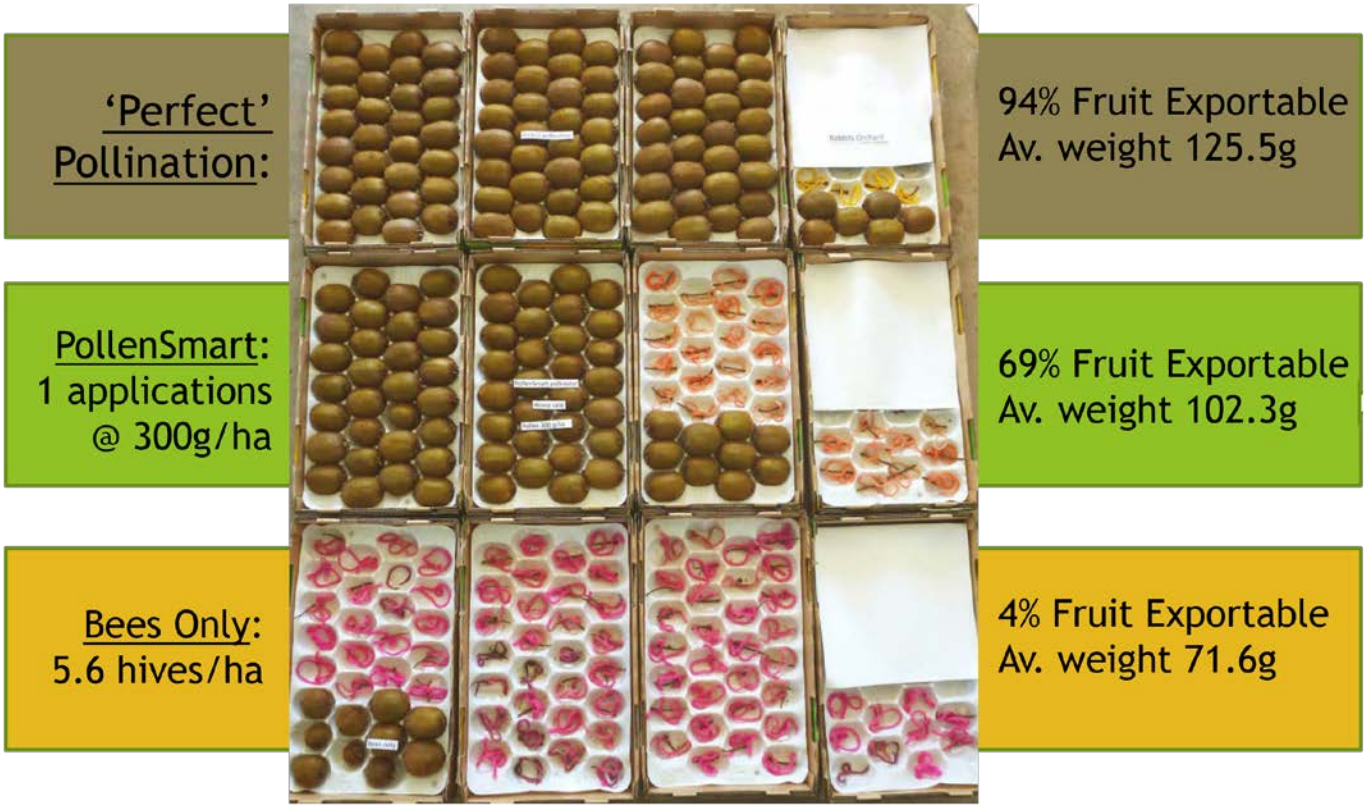
	Pollen Smart			
	Bees only	1 application (200g/ha)	2 applications (200g/ha)	Perfect pollination
Trays/m²	1.23	1.35	1.43	1.49
$/ha	$61,500	$67,500	$71,500	$74,500

- 10 hives/ha
- Good bee activity
- Moderate amount of male flowers

Orchard ‘R’ Trial Data

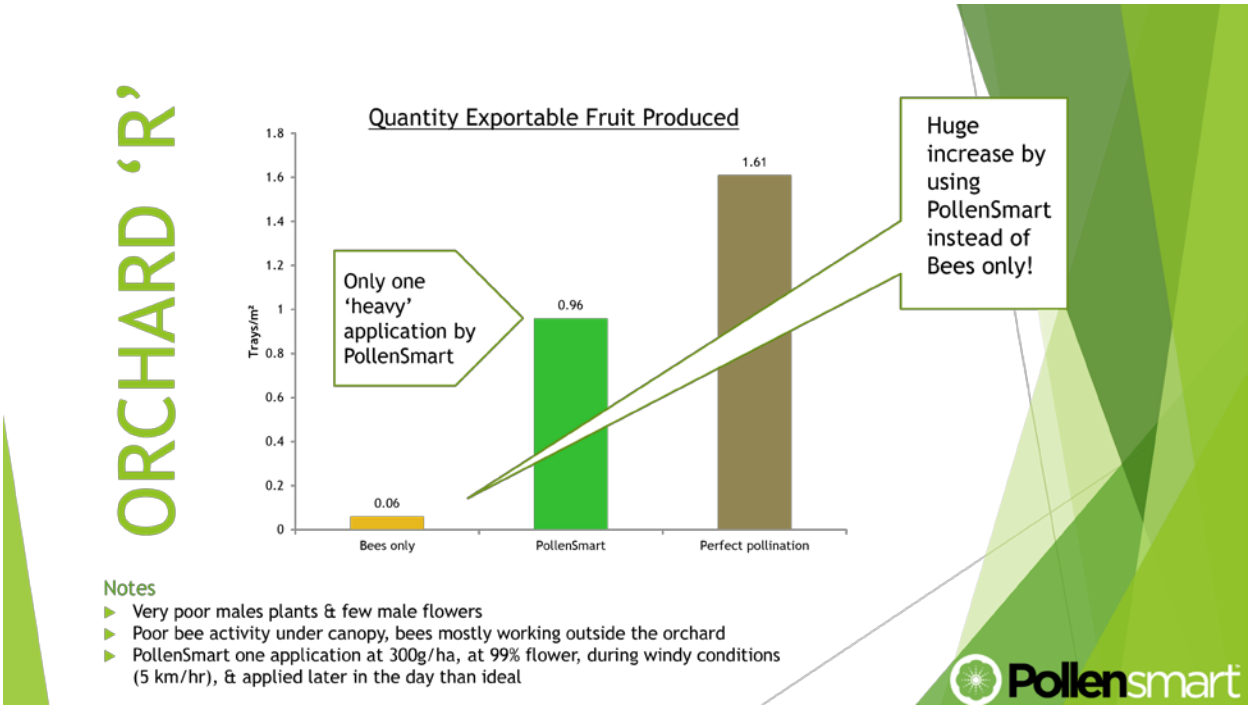
Orchard 'R' had 5.6 hives per hectare but very few bees were observed actually working in the orchard. Very poor males plants, and few males flowers. One PollenSmart application was done at 99% flowering, a low rate of 100g/ha in the morning, and a high rate of 300g/ha in the afternoon. Pollen was applied later in the day than ideal - only once at 99% flowering and in windy conditions (5 km/hr)

Two different trials were run in different parts of this orchard, each with one pass of the PollenSmart at 99% flowering. A low rate of 100g/ha in the morning, and a high rate of 300g/ha in the afternoon, by which time it was windy.



Orchard R

	High rate (300g/ha)		
	Bees only	PollenSmart	Perfect pollination
Trays/m²	0.06	0.96	1.61
$/ha	$3,000	$48,000	$80,500
	Low rate (100g/ha)		
	Bees only	PollenSmart	Perfect pollination
Trays/m²	0.28	0.82	1.64
$/ha	$14,000	$41,000	$82,000



Orchard ‘P’ Trial Data

Orchard 'P' had excellent bee activity (up to 20 bees per bay), with 8 hives per hectare. It has strip males with a moderate quantity of males flowers but there was also PSA bud rot in the males, causing aborted flowers/fruitlets in all trial treatments.

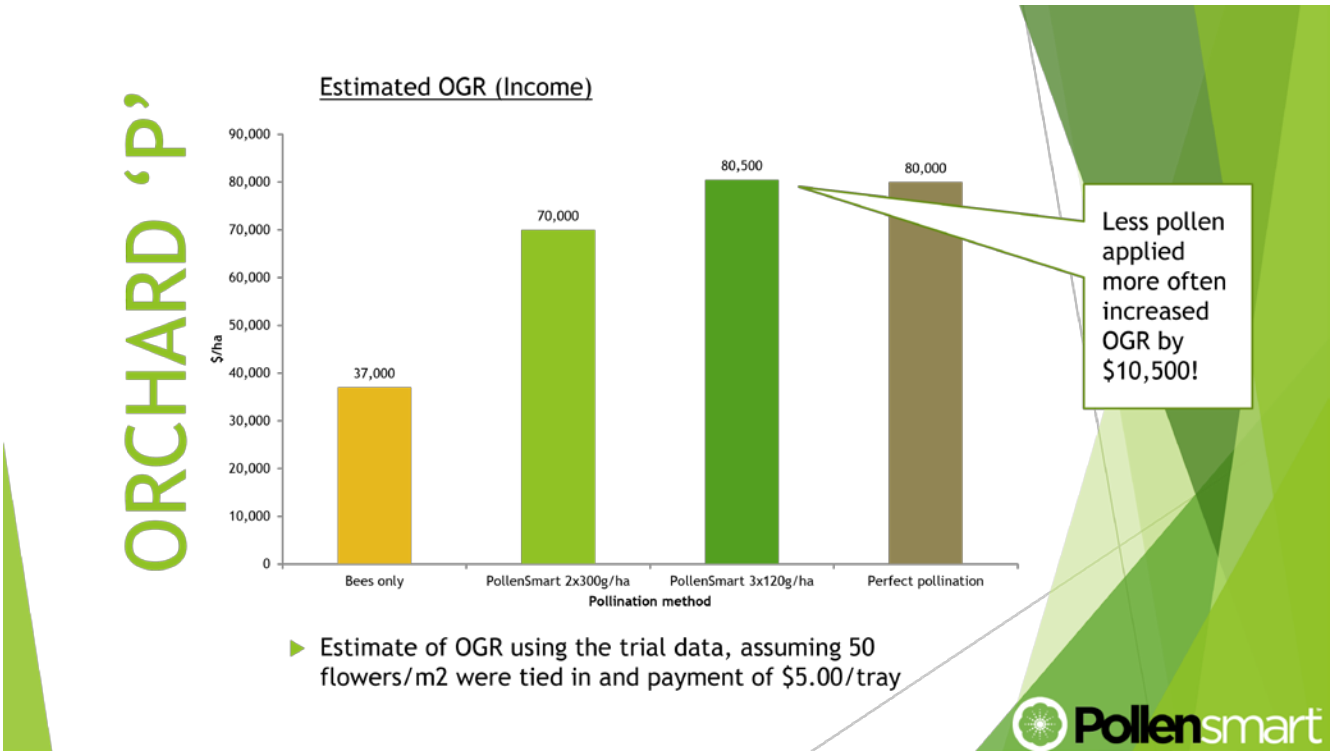
Two different trials were run in different parts of this orchard. One at a high rate of pollen (300g per hectare) applied twice; and then a low rate of 120g per hectare with 3 pollen applications by PollenSmart. Pollen was applied by the PollenSmart during period of 90-99% flowering

Results

The 3 light applications produced the best results, with exportable fruit numbers the same as the flowers pollinated by 'perfect pollination' (male flower rubbed onto female flower) with 88% of the 100 samples producing exportable fruit, and the weight of the PollenSmart fruit being slightly ahead of the 'perfect pollination' at 134.1g. The bees only samples produced 47% exportable fruit weighing on average 112.8g.

Orchard P

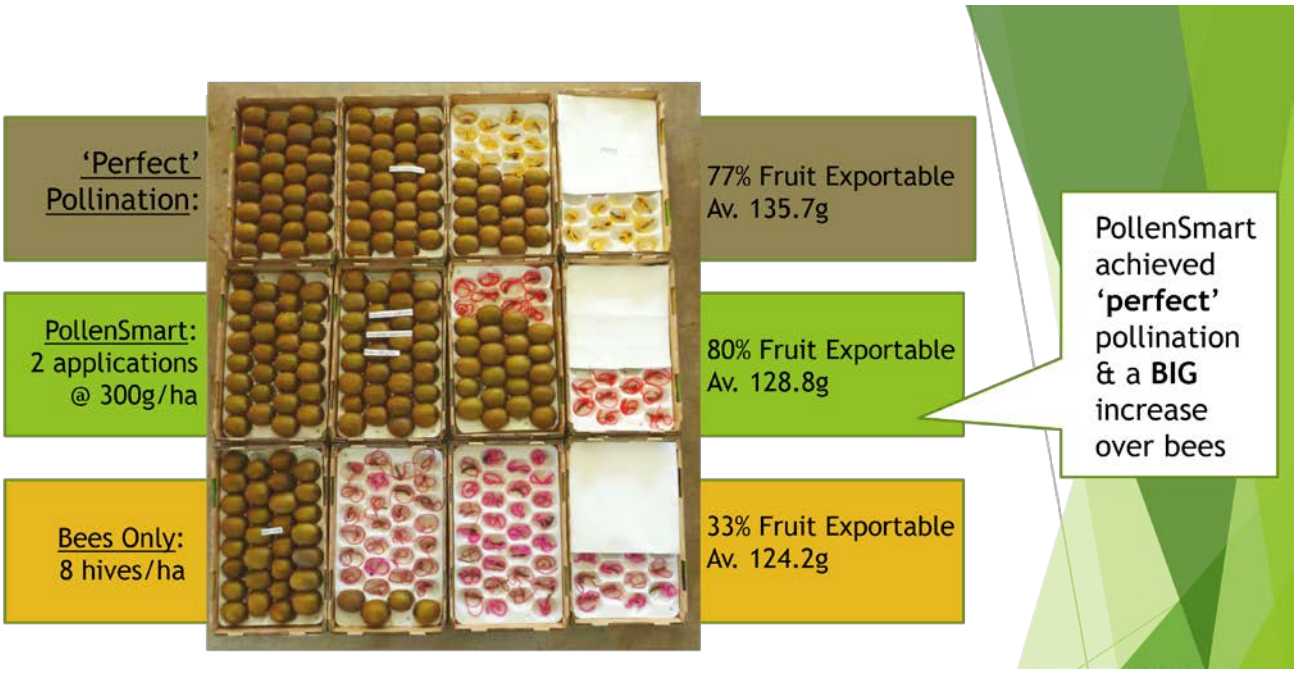
	High rate (300g/ha), 2 pollen applications		
	Bees only	PollenSmart	Perfect pollination
Trays/m²	0.56	1.4	1.43
$/ha	$28,000	$70,000	$71,500
	Low rate (120g/ha), 3 pollen applications		
	Bees only	PollenSmart	Perfect pollination
Trays/m²	0.74	1.61	1.6
$/ha	$37,000	$80,500	$80,000



Comparison of different rates & applications

More applications at a lower rate = better fruit using less pollen

2 Heavy Applications



3 Light Applications