

MAF REPORT ON THE EVALUATION OF THE "POLLI" POLLINATION DEVICE

Dr RM Goodwin
A Ten Houten
J Perry

INTRODUCTION:

The purpose of this study was to conduct a preliminary evaluation of a pollination device. The evaluation consisted of investigating the effect of the device on fruit weights, both with and without supplementary honey bee pollination. Pollen deposition rates were also investigated.

The trial was not designed to provide information on the reliability of the device or the variability of the results with different operators or under the variety of conditions that can occur in kiwifruit orchards during the flowering season.

POLLEN GRAIN DEPOSITION TRIALS:

The deposition trials showed an average of 11,129 staminate pollen grains over the 50 flowers tested. (Adequate pollination is achieved with 3,000 pollen grains deposited per flower).

FRUIT SIZE:

Four Treatment Comparisons were used:

1. Open pollinated (honey bee)
2. Hand pollination (hand + honey bee pollination)
3. Open and "**Polli**" pollinated (honey bee + machine)
4. "**Polli**" pollinated.

The "**Polli**" pollinated flowers were enclosed within a cage covered with shade cloth (while still buds) to prevent honey bees from having access to the flowers. Ten buds in each of these quadrates were marked with wool and left unpollinated to measure the effect of wind pollination and any insects that found their way into the cages. Any other buds within the cages were removed. The cages were removed about one month after flowering.

The hand and "Polli" pollinated flowers were pollinated when the vines were at peak flowering. Any unmarked buds in the hand, "Polli", or "Polli" + open pollinated quadrates at the time of pollination were removed.

EFFECT ON FRUIT SIZE:

The frequency distributions of fruit sizes for the four treatments are presented in the graphs below, and the average fruit weights in Table 1. The hand, open + "Polli" pollinated fruit were significantly heavier ($P < 0.5$) than the open pollinated fruit. The open + "Polli" pollinated fruit were significantly heavier than the hand pollinated fruit, but not significantly heavier than the "Polli" pollinated fruit. The "Polli" and hand pollinated fruit were not significantly different.

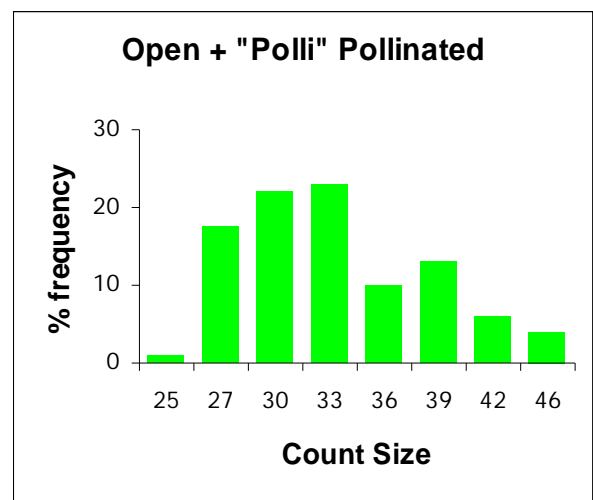
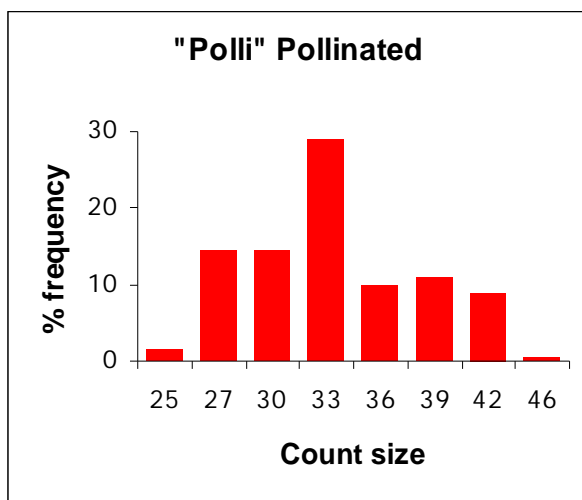
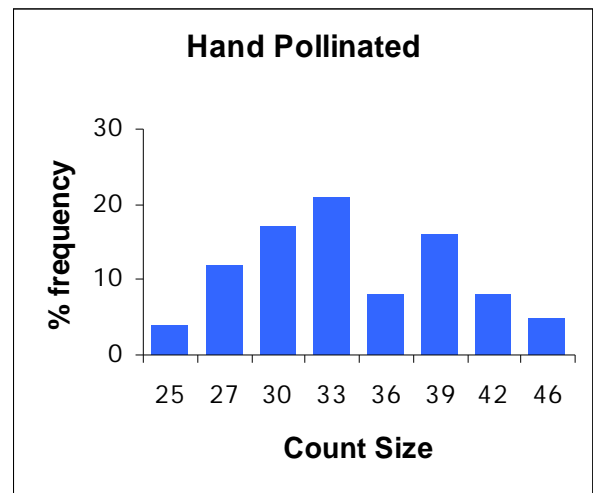
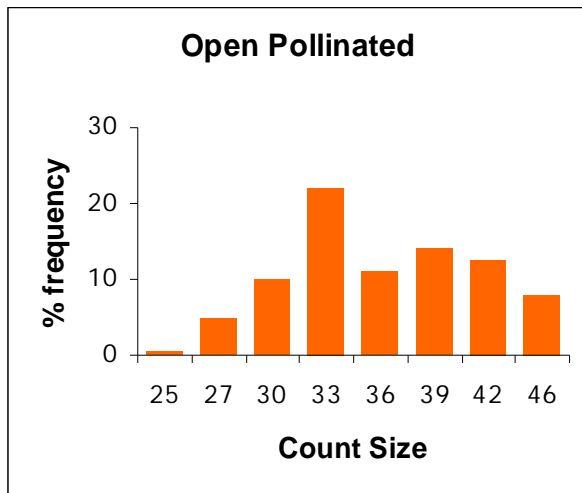


TABLE 1

AVERAGE FRUIT WEIGHTS (g) FOR:- OPEN, HAND, "POLLI", AND OPEN & "POLLI" POLLINATED FRUIT.			
TREATMENT	LARGE	MEAN	SMALL
Open	198	93.19	1.73
Hand	180	105.13	1.58
"Polli"	180	106.50	1.78
Open + "Polli"	179	109.82	1.38

There were eight marked flowers pollinated in one of the cages. The fruit had an average weight of 33.12g. The remaining 92 marked flowers were unpollinated.

DISCUSSION:

The "Polli" pollination device deposited high levels of staminate pollen on the stigmas of the pistillate flowers.

The "Polli" + open pollinated fruit were significantly heavier than the open pollinated fruit and the hand pollinated fruit. They were not however significantly heavier than the "Polli" only pollinated fruit. The fruit from all three treatments were significantly heavier than the open pollinated fruit. The "Polli" pollinated fruit were on average 14% heavier than the open pollinated fruit. These results are consistent with the high stigma deposition rates.

As 92% of the flowers in the cages were not pollinated this suggests that wind pollination within the cages can be discounted. The eight flowers that were pollinated in the cages by something other than the pollination device were all in the same cage, which suggests that they were pollinated by an insect that had found its way into the cage. This would not have had a significant effect on the result.

CONCLUSIONS:

1. The "**Polli**" pollination device can deposit high levels of staminate pollen on the stigmas of pistillated flowers and significantly increase fruit size.
2. The "**Polli**" pollination device is capable of producing an exportable size crop without additional honey bee pollination.

Note: This is an abridged version of the comprehensive M.A.F Report 4th June 1991