

## Effect of Foliar Feeding of Hass at Various Stages of Flowering

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### ABSTRACT

A mixture of three macro-and seven micro-elements was sprayed on five-year-old Hass trees at four different stages of flowering. The effect of this foliar spray on tons per hectare and fruit size was determined.

### INTRODUCTION

Flowering and fruit set of Hass avocado trees in KwaZulu-Natal takes place while it is still reasonably cool and there is still very limited root activity (Moore-Gordon *et al.*, 1994). Because of low temperatures, transpiration is reduced.

As the flowers and fruitlets develop, there is increasing competition with new vegetative shoots. At this stage the roots are still inactive and the transpiration rate low. This can result in a low uptake of nutrients.

Finazzo *et al.*, (1994) have found that avocado flowers and fruitlets don't have a greater sink strength than leaves. It was found by Lovatt *et al.*, (1994) that leaves in fact are stronger sinks than flowers. A low uptake of nutrients might result in a shortage in the flowers that can be limiting to pollen tube growth, ovule and pollen viability and fruit set (Robbertse *et al.*, 1991; Lovatt, 1994).

The aim of this trial was to see if the yield of Hass trees can be increased by supplying nutrients directly on the flowers.

### MATERIALS AND METHODS

Five-year-old Hass trees were selected on Zeekoegat (a farm of Everdon Estate). Leaf samples were taken in April 1995, and the results are given in table 1.

From table 1 it can be seen that the N and B levels of the trees are below the norms.

The trees were sprayed with a commercial foliar feed called Supafeed (see table 2) at a pressure of 20 kPa. There were five treatments:

- A — Foliar feed stage 1 (budbreak, prebloom — no open flowers)
- B — Foliar feed stage 2 (first flowers open — no fruit set)
- C — Foliar feed stage 3 (fruit set — still same open flowers)
- D — Foliar feed stage 4 (fruitlets — no flowers left)

- E — Control

Five trees were used per treatment. Care was taken to ensure that spray mist did not contaminate non-treatment trees..

**Table 1**  
Nutrient levels of Hass trees used in trial

<i>Element</i>	<i>Accepted norms</i>	<i>Leaf sample</i>
N	2,2–2,4 %	1,71 %
Ca	1,00–2,00 %	1,41 %
Mg	0,4–0,8 %	0,78 %
K	0,75–1,25 %	0,91 %
P	0,08–0,15 %	0,13 %
Zn	25–100 p.p.m.	61 p.p.m.
Cu	5–15 p.p.m.	12 p.p.m.
Mn	50–250 p.p.m.	217 p.p.m.
B	50–80 p.p.m.	23 p.p.m.

Each tree received 4,5 t of the Supafeed mixture. The actual amount of each nutrient applied per tree is given in table 2.

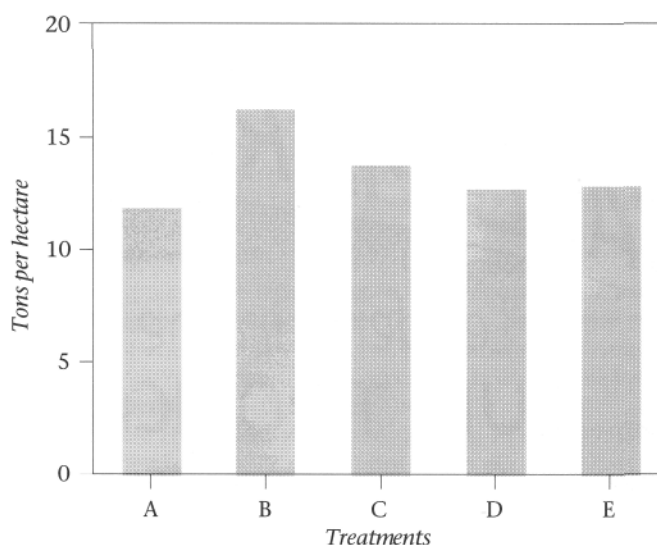
**Table 2**  
Nutrients in Supafeed

<i>Element</i>	<i>Supafeed</i>	<i>Application</i>
N	150 g/kg	4,5 g/tree
P	45 g/kg	1,35 g/tree
K	263 g/kg	7,89 g/tree
Mg	900 mg/kg	27 mg/tree
Fe	750 mg/kg	22,5 mg/tree
Cu	75 mg/kg	2,25 mg/tree
Zn	350 mg/kg	10,5 mg/tree
B	1000 mg/kg	30 mg/tree
Mn	300 mg/kg	9 mg/tree
Mo	70 mg/kg	2,1 mg/tree

The trees were picked individually. Tons per hectare and size distribution were established.

## RESULTS AND DISCUSSION

Trees that received Supafeed on flowers in stage 2 gave the highest tons per hectare (figure 1). The tons per hectare of trees that received Supafeed in the other three stages of flowering was comparable with the control.



**Figure 1**  
The effect of Supafeed on ton per hectare if sprayed on Hass flowers at various stages of flowering.

This confirms the results of Carol Lovatt (1994). The stage of flowering is very important if foliar feed is to be sprayed on flowers.

Lovatt (1994) found that if B or N is sprayed on flowers in the prebloom stage, the yield of Hass can be increased. If B and N are sprayed on the same flowers (not necessarily at the same time) the yield decreased.

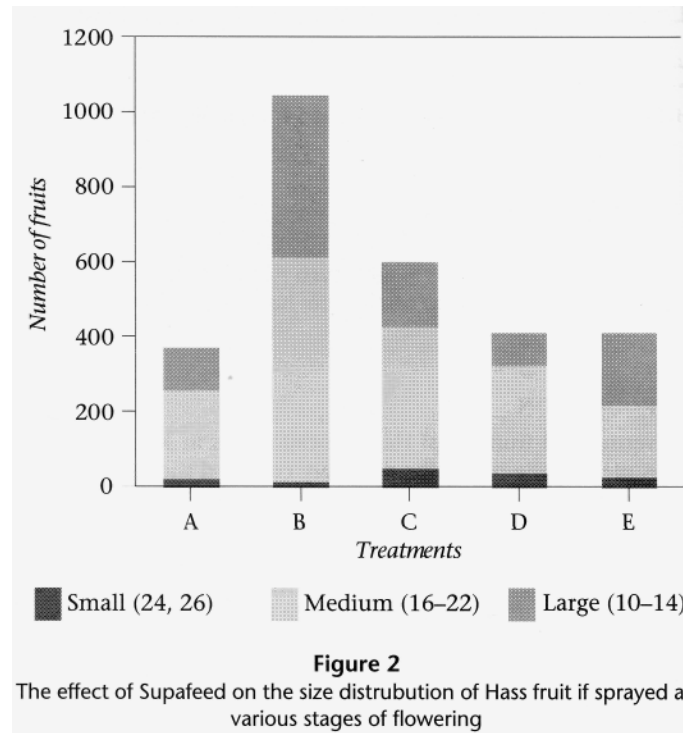
In this trial the Supafeed contained both N and B and the yield increased if the flowers were sprayed in stage 2. This can be because both N and B were low according to the leaf samples before spraying.

Figure 2 shows that spraying Supafeed at stage 2 also resulted in a better size distribution.

## CONCLUSION

If the levels of N and B in Hass leaves are below the accepted norms, spraying Supafeed can increase the yield and also result in a better size distribution. The stage of flowering when spraying takes place is very important. Spraying on flowers should take place as soon as the first individual flowers start to open, before any fruit set has taken place.

This work will have to be repeated on a larger scale to obtain more reliable information. In California inconsistent results were obtained in different years (Lovatt, 1994). It seems as if the nutrient status of the leaves before spraying influenced the effectiveness of the spray.



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