

## Possible Means to Increase Hass Avocado Fruit Size

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### ABSTRACT

A foliar spray of paclobutrazol (250 mg a.i./ℓ) at full flowering increased total yield and the yield of export-size fruit in young Hass trees when compared to the untreated control in two consecutive years. Five Hass-like selections and cultivars (T142, Lamb Hass, Gil, Iriet, 1.14.2) are being evaluated as possible replacements for Hass, and first results on their post-harvest cold storage performance are presented.

### INTRODUCTION

In healthy Hass trees, the quantity of export-size fruit increased when total yield increased (Kremer-Köhne & Köhne, 1995). In the short term, Hass yields may be increased by means of the plant growth regulator paclobutrazol. However, in the long term, the Hass small-fruit problem is to be solved by replacing Hass with a new Hass-like selection.

The purpose of this paper is to report on the effect of paclobutrazol foliar sprays on Hass yield and progress made with the evaluation of Hass-like selections and cultivars.

### PACLOBUTRAZOL FOLIAR SPRAY

Hass avocado trees on Duke 7 rootstock were used in this experiment. The trees were planted in 1991 at Westfalia Estate. The plant growth regulator paclobutrazol (250 mg a.i./ℓ) was applied as a foliar spray at full flowering in September 1993 and 1994. The control trees were left untreated. At harvest 1994 and 1995, individual tree yields were taken. The fruit was then pooled per treatment and sent over a mass sizer to determine the proportion of export-size fruit ( $\geq 160$  g).

In 1994 and 1995, paclobutrazol significantly increased total tree yield and in 1994 paclobutrazol also increased the proportion of export-size Hass fruit when compared to the control (table 1). In Australia, spraying of Hass trees with higher rates of paclobutrazol than reported here resulted in similar improvements regarding yield and fruit size (Whiley *et al.*, 1991).

### NEW HASS-LIKE SELECTIONS AND CULTIVARS

The following Hass-like selections and cultivars and Hass as standard, have been top worked on seven-year-old Hass trees on Duke 7 rootstock: T142, Lamb Hass

(previously BL122), Iriet, Gil (previously 11.19) and 1.14.2. Twenty trees were used per selection. Top working started in 1993 and was completed in 1994.

In 1995, some of the top worked trees bore their first crop. So far T142, Lamb Hass, Iriet and Gil have produced larger fruit than

**Table 1**  
Total yield (kg/tree) and proportion of export-size fruit as influenced by a foliar spray of paclobutrazol (250 mg a.i./ℓ). Data are the means of 24 trees ± SE

	Total yield (kg/tree)		Export-size fruit (%)	
	1994	1995	1994	1995
<i>Paclobutrazol</i>	2,98 ± 0,47	22,84 ± 1,59	78	83
<i>Control</i>	1,69 ± 0,63	16,22 ± 1,84	70	86

Hass, with T142 fruit tending to be too large (mean fruit mass 450 g) and Lamb Hass having a good size (mean fruit mass 274 g). Hass ripened from June to August, T142 ripened from August to September and Lamb Hass matured from July to October. T142 and Lamb Hass were stored for four weeks at 5°C together with Hass control fruit to simulate shipment to Europe. After cold storage the temperature was increased to 18°C to induce ripening. Soft-ripe T142, Lamb Hass and Hass fruit were cut open and were found to be free of physiological disorders and diseases. However, with regard to taste T142 and Lamb Hass fruit were slightly inferior to Hass fruit. Little information has been gained to date about Gil and Iriet as they have produced very few fruits as yet. Both cultivars seem to mature later than Hass under South African growing conditions. There was no fruit from the selection 1.14.2.

## REFERENCES

- KREMER-KÖHNE, S. & KÖHNE, J.S. 1995. Approaches to solving the Hass small fruit problem: progress report. *South African Avocado Growers' Association Yearbook*. 18: 59 - 60.
- WHILEY, A.W., SARANAH, J.B., WOLSTENHOLME, B.N. & RASMUSSEN, T.S. 1991. Use of paclobutrazol sprays at mid-anthesis for increasing fruit size of avocado (*Persea Americana* Mill, cv. Hass). *J. Hortic. Sci.* 66: 593 - 600.