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# Increased yield through girdling of young Hass trees prior to thinning

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## *ABSTRACT*

*Girdling of all main limbs in four-year-old Hass trees in the year prior to tree thinning, increased individual tree yields by 60%. A considerably higher number of export cartons, packed from girdled trees, compensated by far for the smaller proportion of export quality fruit when compared to ungirdled trees. The girdled trees were removed after harvest to prevent crowding*

## INTRODUCTION

Girdling is an effective means of increasing productivity in many fruit trees (Noel, 1970), including avocados (Lahav *et al,* 1971; Toerien & Basson, 1979). This can be attributed to the accumulation of carbohydrates and the temporary cessation of vegetative growth above the girdle (Noel, 1970).

Trochoulias and O'Neill (1976) report that girdling a few limbs per Fuerte tree every year, has been particularly successful. However, girdling increased the percentage of small fruit. Some experienced growers feel that the heavy yield of a girdled limb is produced at the expense of the rest of the tree (Anonymous, 1984). Toerien and Basson (1979) therefore suggested the girdling of all main limbs on healthy trees, to be done one year before these trees have to be removed, to prevent crowding.

This study investigates the effect of girdling of all main limbs of healthy young Hass trees in the year prior to their thinning.

## MATERIALS AND METHODS

A commercial orchard (0,96 ha) of Hass trees on Duke 7 rootstock was selected at Westfalia Estate, north-eastern Transvaal. In February 1987, the trees were planted at a spacing of 2,5 by 5,0 m (800 trees per hectare). In September 1990, every second tree, i.e. all the temporary trees, were girdled while the permanent trees remained un-girdled (control). Girdling was done with a girdling tool which simultaneously cuts and removes the bark strip. The width of the girdle was 5 mm. The girdled trees were removed after harvest in 1991 to prevent crowding.

At harvest in July 1991, the fruit from girdled trees and ungirdled trees respectively were combined and weighed. Thereafter, fruit underwent commercial grading (export, local, factory) and the export grade was sized according to weight. For comparative purposes, yield figures were converted to a one hectare basis.

## RESULTS AND DISCUSSION

Yield per tree was increased by 60% following girdling, with the yield of the girdled trees averaging 24 kg while that of the un-girdled trees averaged 15 kg. The total yield of the girdled and un-girdled trees was equivalent to 15,6 t/ha (Table 1), i.e. girdling the temporary trees increased total yield by 30% per hectare.

Girdling decreased the percentage of export quality fruit by 6% (Table 1). This was due to an increased percentage of small fruit (factory grade) as a result of the higher crop load on the girdled trees, compared to un-girdled trees. However, the smaller proportion of export quality fruit from girdled trees was more than compensated for by the much higher yields. The number of export cartons packed from girdled and un-girdled trees is presented in Figure 1. With the exception of the count 12 category, the number of export cartons packed was clearly higher for the girdled trees than for the un-girdled trees.

In conclusion, it can be recommended that healthy young Hass trees should be girdled in the year prior to thinning, as a considerably higher number of export cartons were packed from the girdled trees when compared to the ungirdled trees.

**TABLE 1 Yield and quality of fruit on the basis of 400 girdled and 400 ungirdled four-year-old Hass trees as well as total yield per hectare (800 trees)**

| Grade | Girdled | | Ungirdled | | Total yield (t/ha) |
|---|---|---|---|---|---|
| | % | t | % | t | |
| Export | 77 | 7,40 | 83 | 4,98 | 12,38 |
| Local | 4 | 0,38 | 3 | 0,18 | 0,56 |
| Factory | 19 | 1,82 | 14 | 0,84 | 2,66 |
| Total | 100 | 9,60 | 100 | 6,00 | 15,60 |

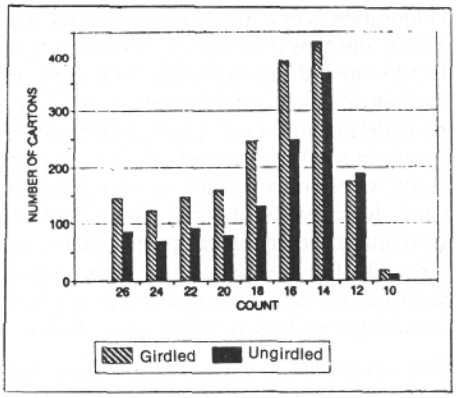


**Fig 1** Export pack-out in 4 kg cartons for a four-year-old high density Hass planting (1,0 ha) on the basis of 400 girdled and 400 ungirdled trees.

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