

Evaluation of the Hass-like avocado cultivars Harvest, Gem and Grace

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ABSTRACT

The evaluation of the avocado cultivars Gem, Harvest (Kiepersol, Levubu and KZN) and Grace (Tzaneen) continued. 'Hass', 'Harvest' and 'Gem' trees at Danroc Estate (Kiepersol) bore a first crop in the 2005/06 season. 'Harvest' out-produced 'Gem' and 'Hass' by 60 and 74 kg/tree respectively. In general, 'Harvest' and 'Gem' (count 10 – 14) fruit were bigger than 'Hass' (count 12 – 16) fruit. The post-harvest fruit quality, after simulated shipment, of 'Gem' and 'Hass' was good, but some degree of vascular browning was observed in a large percentage of the 'Harvest' fruit. In Levubu, at Springfield Estate, the trees flowered in 2006 and a first small crop is expected in 2007. The top worked 'Grace' and 'Hass' trees bore a second crop in the 2005/06 season, with 'Grace' out-producing 'Hass' by 39 kg/tree. The cultivar Grace has on average bigger fruit than 'Hass' and the fruit quality after simulated shipment was good for both cultivars.

INTRODUCTION

The Westfalia Technological Services (WTS) avocado cultivar evaluation program has been focused on finding a high yielding, better sized, good quality, earlier or later maturing Hass-like cultivar. The program was initiated in the early 1990s and various cultivars from Israel, California and South Africa were evaluated over the years (Bruwer & Mokgalabone, 2005). The cultivars Gem and Harvest, from the Californian breeding program, have been evaluated by WTS since 1996. Both cultivars performed well at Westfalia Estate and SAAGA negotiated a test agreement with the University of California for the evaluation of these cultivars in three other South African production regions (Kremer-Köhne & Mokgalabone, 2004). Further, the evaluation of a local selection 'Grace' from the Kiepersol area in Mpumalanga was initiated in 2003. This report is an update on the progress made with the evaluation of 'Harvest' and 'Gem' in the other production regions and results obtained with 'Grace' at Westfalia Estate.

MATERIALS AND METHODS

'Grace' and 'Hass' trees were top worked (Duke 7 clonal rootstock) at Westfalia Estate in 2003. Yield data were recorded as kg/tree and extrapolated to ton/ha for 200 trees/ha. A representative sample of each cultivar was used to determine the fruit size distribution, by weighing fruit individually. A sample of each cultivar underwent simulated shipment of 28 days at 5.5°C to determine post-harvest fruit quality (Bruwer & Mokgalabone, 2005). In order to establish the harvesting season of 'Grace' in relation to that of 'Hass', regular moisture content determinations of both cultivars were done throughout the season. In the Levubu area (Springfield Estate) of Limpopo Province, 15 trees each of 'Gem', 'Harvest' and 'Hass' (Velvick seedling rootstock) were planted in early 2005. In the Kiepersol area (Danroc Estate) of Mpumalanga Province and in the Howick area (Everdon Estate) of KwaZulu-Natal, 15 trees each of 'Gem', 'Hass' and 'Harvest' (Duke 7 rootstock) were top worked in 2004 and 2006 respectively. A first crop was harvested from the trees in the Kiepersol area in 2005/06. Individual tree yield data was recorded and extrapolated to ton/ha for 100 trees/ha. The fruit were pooled per cultivar and put over a pack line in order to determine the fruit size distribution (according to a 4 kg carton) and pack-out figures

according to export, local and factory grades. A sample of each cultivar underwent simulated shipment as described, to evaluate the post-harvest fruit quality.

RESULTS AND DISCUSSION

A good second crop was harvested in 2006 from the 'Hass' (12 t/ha) and 'Grace' (19.8 t/ha) trees at Westfalia Estate. The cultivar Grace out-performed Hass by 8 t/ha over the two years of evaluation (Figure 1). In general, the average fruit size of 'Hass' and 'Grace' declined in 2006 and both cultivars had a large percentage of fruit in the very small categories. However, 'Grace' fruit

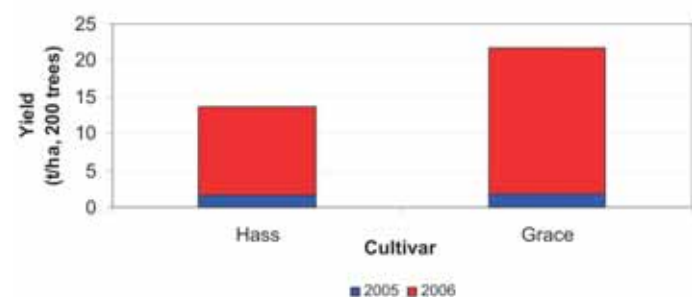


Figure 1: Cumulative yield of the cultivars Hass and Grace at Westfalia Estate for the period 2005-2006, extrapolated to ton/ha for 200 trees/ha.

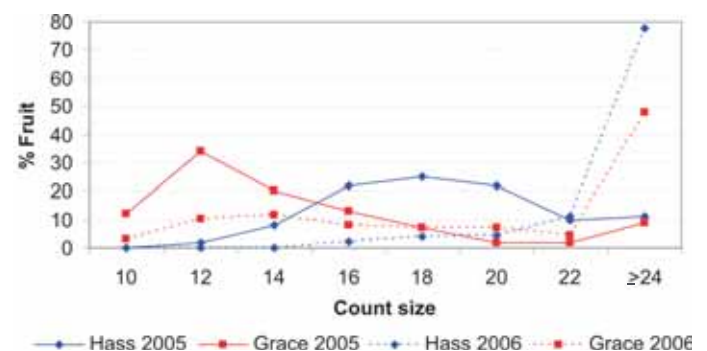


Figure 2: Fruit size distribution of the cultivars Hass and Grace at Westfalia Estate for the period 2005-2006 (count sizes according to a 4 kg carton).



are on average bigger than 'Hass' fruit (**Figure 2**). Fruit quality after simulated shipment was good for both cultivars. It was evident from the moisture content determinations that 'Grace' fruit matured at least one month later than 'Hass' fruit (data not shown).

A good first crop was harvested in 2006 from the 'Hass' (6 t/ha), 'Gem' (7 t/ha) and 'Harvest' (13 t/ha) trees at Danroc Estate in the Kiepersol area. The fruit were of very good quality, resulting in an export pack-out of 84% for 'Harvest', 85.3% for 'Hass' and 90.3% for 'Gem'. The main fruit size of the export grade 'Harvest' and 'Gem' fruit was a count 12, but a large percentage of fruit were in the count 10 and 14 categories. 'Hass' fruit were smaller than 'Harvest' and 'Gem' fruit with most fruit in the count 14 category and some fruit in the count 12 and 16 categories. As this was the first crop from young top worked trees, a decline in the fruit size of all three cultivars can be expected as the trees get older. The post-harvest fruit quality after simulated shipment of 'Gem' and 'Hass' was good, but some degree of vascular browning was observed in a large percentage of the 'Harvest' fruit (data not shown). Kremer-Köhne & Mokgalabone (2003) reported on severe vascular browning observed in 'Harvest' fruit during the 2002 season of the evaluation done at Westfalia Estate. This was attributed to the occurrence of low orchard temperatures experienced during the season of evaluation.

CONCLUSIONS

Under the current testing conditions, the cultivar 'Grace' seems

to be a better producer with a bigger average fruit size when compared to 'Hass'. However, as the fruit matures in the middle of the 'Hass' season, the commercial benefit of this cultivar is limited. The results obtained with the cultivars Harvest and Gem in the Kiepersol area confirmed the results obtained at Westfalia Estate.

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