

Evaluation of new Hass-like avocado cultivars at Merensky Technological Services

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ABSTRACT

The new Hass-like cultivars Lamb Hass, Iriet, Gil and 1.14.2 were topworked at Westfalia Estate in 1994. For comparison, Hass trees have also been topworked. Data on fruit maturity, yield, fruit size distribution and fruit quality after simulated export, were collected. Lamb Hass was found to be the most promising new Hass-like cultivar. Lamb Hass fruit mature from August to October, and the average fruit count is 12-14. The cultivar Iriet also shows some promise and further testing is warranted. The evaluation of Gil and 1.14.2, however, has been discontinued. Topworking the new Hass-like cultivars Harvest, Gem, Sir Prize, BL 667 and Bonus started in 1996 and a first crop is expected in 1999.

INTRODUCTION

Hass trees produce a large percentage of undersized fruit causing high financial losses in the South African avocado industry. In the long term, the Hass small fruit problem could be solved by replacing Hass with a new Hass-like cultivar. Therefore, the following new Hass-like cultivars are currently being tested at Westfalia Estate: Lamb Hass, Harvest, Gem, Sir Prize, BL 667, Iriet, Gil, 1.14.2 and Bonus. Lamb Hass, Harvest, Gem, Sir Prize and BL 667 originate from a Californian breeding programme (Witney & Martin, 1995), while Iriet (Lahav et al., 1989) and Gil (Lahav et al., 1995) have been selected in Israel. Selection 1.14.2 originates from the Western Cape (Smit, 1995), and Bonus was selected at Westfalia Estate. This paper reports on the progress made with the evaluation of these Hass-like selections and cultivars.

MATERIAL AND METHODS

Four Hass-like selections and cultivars (Lamb Hass, Iriet, Gil and 1.14.2) and Hass as standard were topworked on 7-year old Hass stumps on Duke 7 rootstock. Twenty trees per selection were used. Topworking started in 1993 and was completed in 1994. Data on fruit maturity, yield, fruit size distribution and fruit quality after simulated export, were collected.

Moisture content, as an indication of fruit maturity was determined. The moisture contents of Hass and the maternal parent of Lamb Hass, Gwen, were also determined. As in Hass, the maximum moisture content of 75% was used as a maturity index. At

harvest, individual tree yields were taken. For Hass and Lamb Hass, the fruit was then pooled per cultivar and sent over a mass sizer to determine the proportion of export size fruit (>1 60g). For Iriet and Gil, fruit samples were taken and fruit weighed individually to determine the count distribution.

Fruit were stored for four weeks at 5.5°C to simulate sea shipment to Europe. Thereafter the fruit were ripened at T-8°C. Ripe fruit were inspected and assessed for anthracnose, stem-end rot, black and brown cold damage symptoms as well as lenticel damage, and the internal physiological disorders pulp spot and grey pulp. The shelf-life of fruit was also evaluated.

Topworking the new Hass-like cultivars Harvest, Gem, Sir Prize, BL 667 and Bonus started in 1996, and a first crop is expected in 1 999.

RESULTS

Lamb Hass and Gil trees are very upright growing trees, similar in height to Hass, whereas Iriet trees are small to medium sized with slightly drooping branches. 1.1 4.2 being vigorously growing trees, produced very few fruit and its testing therefore was discontinued in 1997.

The fruit moisture content of Hass, Lamb Hass and Gwen is shown in Figure 1 and that of Hass, Iriet and Gil in Figure 2. Hass reached picking maturity at the end of May, while all new Hass-like cultivars matured later: Lamb Hass fruit mature from August to October, Iriet fruit from July to September and Gil fruit from August to September.

Table 1. Yields (t/ha) of avocado cultivars Hass, Lamb Hass, Iriet and Gil for the years 1995 through 1998.

Cultivar	t/ha ⁽¹⁾				Cumulative
	1995	1996 ⁽²⁾	1997	1998	
Hass	-	-	1.5	23.3	24.8
Lamb Hass	16.6	6.2	2.1	25.5	50.4
Iriet	-	-	3.0	11.9	14.9
Gil	-	-	3.8	10.4	14.2

⁽¹⁾ based on 200 trees/ha

⁽²⁾ hail

Yield data are presented in Table 1. All cultivars tested had an alternate bearing pattern. In December 1995, hail destroyed most of the 1996 crop, and 1996 would have been an 'on-year'. Lamb Hass trees were more precocious than trees of Hass and the other new Hass-like cultivars. Furthermore, Lamb Hass trees produced a considerably higher cumulative yield than the other cultivars. The lower cumulative yields in Iriet and Gil

could be compensated for by a closer tree spacing. With regard to the count distribution, fruit size varies with crop size, but Lamb Hass is typically larger than Hass. The average Lamb Hass fruit size is count 12 to 14. In 1998, however, Hass and Lamb Hass were very similar in their count distribution (Figure 3). The percentage of fruit smaller than count 24 ($\leq 160\text{g}$) was 50% in Hass, and 30% in Lamb Hass (1998). These high percentages of small fruit were due to deteriorating tree condition in the test orchard but nevertheless showed the difference between the two cultivars. For Iriet and Gil, the average fruit counts are 12 and 10-12 respectively. Gil and Iriet had only 2% of fruit smaller than count 24.

Hass, Lamb Hass and Iriet fruit stored well in 1997 and 1998 (data not shown). The fruit quality of Lamb Hass particularly compared favourably to the Hass standard, although flesh fibres were more common in Lamb Hass than in Hass. Iriet fruit have an excellent flavour, but similar to Gwen, tend to shrivel. In Gil, about 30% of fruit had brown pulp discolourations below the seed after storage. For this reason, the evaluation of Gil was discontinued after the 1998 harvest.

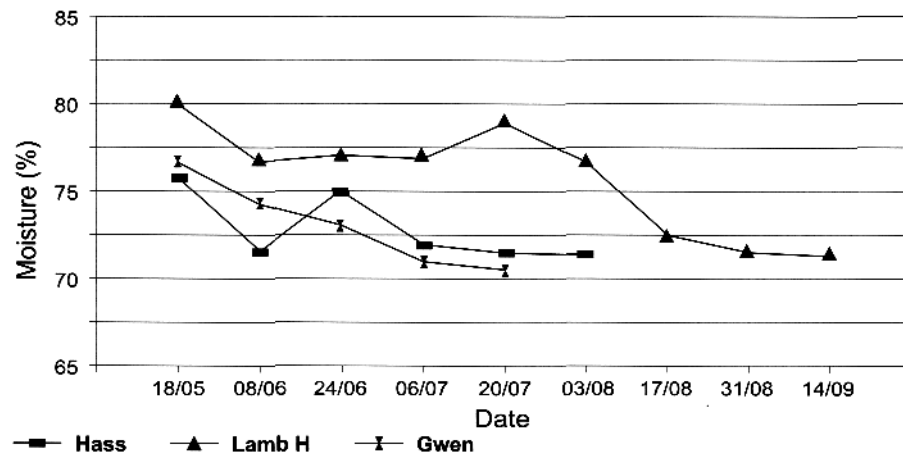


Figure 1: Fruit moisture content of the avocado cultivars Hass, Lamb Hass and Gwen (1998)

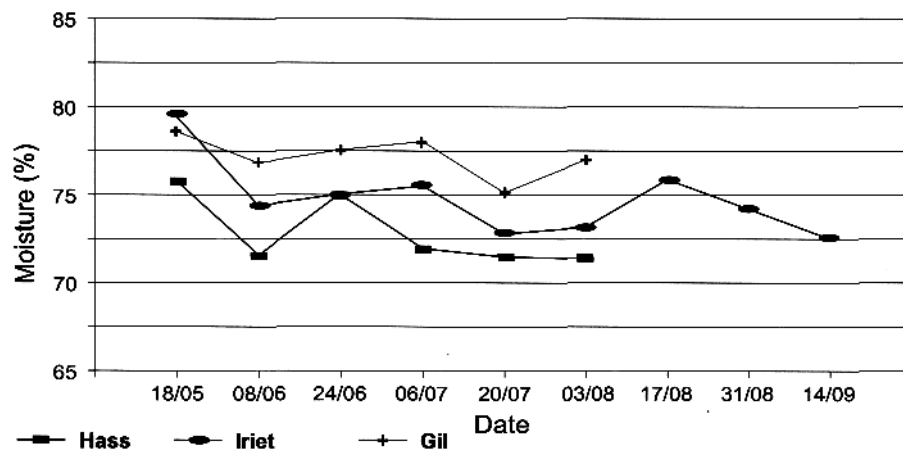


Figure 2: Fruit moisture content of the avocado cultivars Hass, Iriet and Gil (1998)

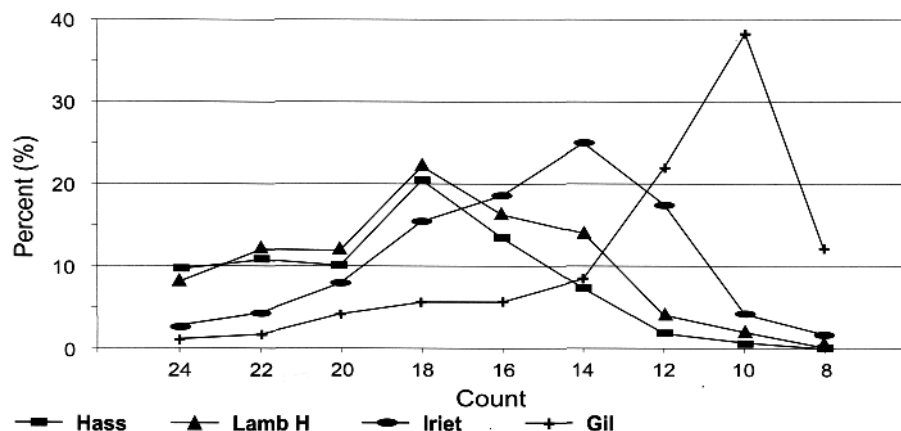


Figure 3: Fruit size distribution of the avocado cultivars Hass, Lamb Hass, Iriet and Gil (1998)

In conclusion, all new Hass-like cultivars which were tested matured later in the year than Hass. Lamb Hass was found to be the most promising new Hass-like cultivar, while the cultivar Iriet also shows some promise and further testing is warranted. The evaluation of Gil and 1.14.2, however, has been discontinued.

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