

New Hass-like avocado cultivars at Merensky Technological Services: Progress report on the evaluation of Harvest and Gem in 2003

S Kremer-Köhne and M L Mokgalabone

Merensky Technological Services,
PO Box 14, Duiwelskloof 0835, South Africa
E-mail: sylviiek@hansmerensky.co.za

ABSTRACT

In 2003 a fifth crop was evaluated and the cumulative yields (1999-2003) were 181, 113 and 103 t/ha for 'Harvest', 'Gem' and 'Hass', respectively. Cultivars Hass, Harvest and Gem reached picking maturity in June, July and September, respectively. All three cultivars had good fruit quality, and fruit quality problems recorded for 'Harvest' in 2002, did not re-occur in 2003. Further evaluation of these two cultivars is warranted and is being extended to three other South African production regions.

INTRODUCTION

The long term aim of this project is to find a new Hass-like cultivar which consistently bears higher yields than 'Hass', and to extend the 'Hass' season. Therefore, the following new Hass-like cultivars have been evaluated at Westfalia Estate since 1996: Harvest, Gem, Jewel, Sir Prize, Nobel, 8-22-5 and Bonus. Due to low yields, large fruit, colour problems and / or the high incidence of physiological disorders, the evaluation of 'Jewel', 'Nobel', '8-22-5', 'Bonus' and 'Sir Prize' was discontinued after the 2001 season. 'Harvest' and 'Gem', however, out-produced 'Hass' and had good fruit quality (Kremer-Köhne, 2000, 2001 and 2002; Kremer-Köhne & Mokgalabone, 2003). Therefore these two cultivars were further evaluated and data are updated in this paper.

originated from a Californian breeding program (Witney & Martin, 1995) and were top-worked at Westfalia Estate in 1996. For comparison, trees were also top-worked with 'Hass'.

In 2003 fruit were picked on several dates in June through October and fruit size distribution was determined by taking fruit samples and weighing fruit individually. Data on yield and fruit quality after simulated shipment were collected as described previously (Kremer-Köhne, 1999). Fruit were waxed with Avoshine (Citrashine Pty. Ltd.) and fruit firmness readings were taken with a densimeter (Köhne *et al.*, 1998) before storage and upon removal from cold storage. Black cold and lenticel damage were also evaluated upon removal from cold storage, while skin colour, diseases and physiological disorders were rated when the fruit were eat ripe.

MATERIALS AND METHODS

The new Hass-like cultivars Harvest and Gem

RESULTS

In 2003, 'Harvest', 'Gem' and 'Hass' produced

Table 1. Yields (t/ha) and peaks of the fruit size distribution of the new Hass-like cultivars Harvest and Gem at Westfalia Estate (top-worked 1996) for the years 1999 through 2003

Cultivar	Yield (t/ha) ¹⁾						Count peak ²⁾
	1999	2000	2001	2002	2003	Cumulative	
Harvest	29.2	37.0	52.4	19.3	42.9	180.8	12-16
Gem	11.4	28.2	23.8	27.0	22.8	113.2	12-14
Hass	2.8	20.0	29.7	35.4	15.2	103.1	16

¹⁾ extrapolated to 200 trees/ha

²⁾ based on a 4 kg carton

Table 2. Post-harvest quality of the new Hass-like cultivars Harvest and Gem, compared with the standard 'Hass' after simulated shipment (28 days at 5.5°C) in 2003. Symptoms are presented as average ratings on a scale of 0 (no symptom) to 3 (severe symptom)

Cultivar	Harvest		Gem	Hass		
	16/07/03	18/09/03		16/07/03	18/09/03	07/10/03
Date picked	16/07/03	18/09/03	07/10/03	16/07/03	18/09/03	07/10/03
Number of fruit	140	140	140	139	140	140
Densimeter	94.7	94.0	94.1	93.6	93.2	93.5
Evaluation upon removal from cold storage						
Densimeter	90.3	88.1	88.9	84.9	87.1	89.1
Black cold damage	0	0.057	0.050	0	0.021	0.021
Lenticel damage	0.750	0.057	0.457	0.993	0.128	0.157
Evaluation when eat ripe						
Skin colour						
Green/black (%)	89	73	61	100	100	24
Black (%)	11	27	39	0	0	76
Anthracnose	0	0	0.035	0	0	0
Stem-end rot	0.093	0.028	0	0	0	0
Grey pulp	0.023	0	0	0	0	0
Vascular browning	0.114	0.421	0.050	0.021	0.035	0
Days to ripening	6.0	4.3	5.2	5.0	2.7	6.1

their fifth crop. Cultivars Hass, Harvest and Gem reached picking maturity in June, July and September, respectively. Yields and the peaks of the fruit size distribution are shown in Table 1. The cumulative yield (1999 – 2003) of cultivar Harvest was 75% and 60% higher than that of 'Hass' and 'Gem' respectively. Data on fruit quality after simulated shipment is shown in Table 2 for selected picking dates. All three cultivars had good fruit quality, and fruit quality problems recorded for 'Harvest' in 2002 (Kremer-Köhne & Mokgalabone, 2003), did not re-occur in 2003.

CONCLUSIONS

The new Hass-like cultivars Harvest and Gem matured later in the year than 'Hass'. 'Harvest' out-produced 'Hass' and 'Gem' by 75% and 60% respectively over the 5-year period 1999-2003. In 2003, all three cultivars had good fruit quality, and fruit quality problems recorded for 'Harvest' in 2002, did not re-occur in 2003. Further evaluation of these two cultivars is warranted and is being extended to three other South African production regions under a new test agreement between SAAGA and the University of California.

ACKNOWLEDGEMENTS

The authors wish to thank SAAGA for financial support and E. Mailula for technical assistance.

LITERATURE CITED

- KÖHNE, J.S., KREMER-KÖHNE, S. & GAY, S.H. 1998. Non-destructive avocado fruit firmness measurement. *South African Avocado Growers' Association Yearbook 21*: 19-21.
- KREMER-KÖHNE, S. 1999. Evaluation of new Hass-like avocado cultivars at Merensky Technological Services. *South African Avocado Growers' Association Yearbook 22*: 120-122.
- KREMER-KÖHNE, S. 2000. New Hass-like avocado cultivars at Merensky Technological Services - progress report. *South African Avocado Growers' Association Yearbook 23*: 52-55.
- KREMER-KÖHNE, S. 2001. New Hass-like avocado cultivars at Merensky Technological Services – further progress in 2000. *South African Avocado Growers' Association Yearbook 24*: 43-44.
- KREMER-KÖHNE, S. 2002. New Hass-like avocado cultivars at Merensky Technological Services – progress in 2001. *South African Avocado Growers' Association Yearbook 25*: 14-16.
- KREMER-KÖHNE, S. & MOKGALABONE, M.L. 2003. Progress report on the evaluation of the new Hass-like avocado cultivars Harvest and Gem in 2002. *South African Avocado Growers' Association Yearbook 26*: 41-43.
- WITNEY, G. & MARTIN, G. 1995. Taking the California avocado breeding program into the next century. Proc. World Avocado Congress III: 114-118.