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New Hass-like avocado cultivars at Merensky Technological Services – progress in 2001

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ABSTRACT

Six new Hass-like cultivars from California (Harvest, Gem, Jewel, Sir Prize, Nobel, 8-22-5) and one Westfalia selection (Bonus) were evaluated. Top-working started in 1996, and the third crop was evaluated in 2001. Cultivars Harvest and Gem matured slightly later than 'Hass'. Both 'Harvest' and 'Gem' out-produced 'Hass' and had good fruit quality. Therefore further testing of these two cultivars, also in other South African avocado growing areas, is warranted. All the other cultivars tested either produced low yields, large fruit, did not colour up and / or had a high incidence of physiological disorders. Their testing therefore, was discontinued after the 2001 season.

INTRODUCTION

The long term aim of this project is to find a new Hass-like cultivar with higher yield and a more favourable fruit size distribution than 'Hass'. Therefore, the following new Hass-like cultivars are currently tested at Westfalia Estate: Harvest, Gem, Jewel, Sir Prize, Nobel (previously BL 667), 8-22-5 and Bonus. Progress made with the evaluation of these Hass-like cultivars was reported previously (Kremer-Köhne, 2000; Kremer-Köhne, 2001) and data are updated in this paper.

MATERIALS AND METHODS

The new Hass-like cultivars Harvest, Gem, Jewel, Sir Prize, Nobel and 8-22-5 originate from a Californian breeding program (Witney & Martin, 1995), and Bonus was selected at Westfalia Estate. Top-working these new Hass-like cultivars started at Westfalia Estate in 1996. For comparison, trees were also top-worked with 'Hass'.

In 2001, fruit were picked on several dates from mid June to early September and waxed with Avoshine (Citrashine Pty. Ltd.). Data on yield, fruit size distribution and fruit quality after simulated export were collected as described previously (Kremer-Köhne, 1999). 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. Fruit size distribution was determined by taking fruit samples and weighing fruit individually.

RESULTS

In 2001, 'Sir Prize', 'Harvest', 'Gem', 'Nobel', 'Jewel' and 'Hass' produced their third crop, while '8-22-5' and 'Bonus' produced their second crop. 'Sir Prize', 'Nobel', '8-22-5',

Table 1. Yields (t/ha) and peaks of the fruit size distribution of new Hass-like cultivars at Westfalia Estate (top-worked 1996) for the years 1999 through 2001.

Cultivar	Yield (t/ha)[1)]				Count peak[2)]
	1999	2000	2001	Cumulative	
Harvest	29.2	37.0	52.4	118.6	12-16
Gem	11.4	28.2	23.8	63.4	12-14
Sir Prize	18.8	26.0	11.1	55.9	8-12
Hass	2.8	20.0	29.7	52.5	16
8-22-5	0	6.6	23.2	29.8	8-10
Nobel	6.8	7.8	10.9	25.5	14
Bonus	0	10.8	6.4	17.2	14-16
Jewel	4.6	5.6	5.9	16.1	8-10

[1)] based on 200 trees/ha
[2)] based on a 4 kg carton

'Jewel' and 'Hass' ripened in June, while 'Harvest', 'Gem' and 'Bonus' ripened in July through early September. Yields and the peaks of the fruit size distribution are shown in Table 1. Cumulative yields (1999 – 2001) of cultivars Harvest and Gem were higher than that of 'Hass' by 125% and 20% respectively, while Bonus and Jewel produced very low yields. 'Sir Prize', 'Jewel' and '8-22-5' fruit were found to be too large, while the fruit size distribution curve peaked at the more favourable counts 12 to 16 for 'Harvest', and at count 16 for 'Hass'. Fruit quality after simulated export is shown in Tables 2a and 2b. Overall, 'Harvest' and 'Gem' gave the best results with regard to fruit quality. Cultivar Harvest coloured up to the green / black stage, and only coloured up black with the last picking round. As in 1999 and 2000, cultivars Jewel and Nobel did not colour up. With regard to physiological disorders, 'Nobel', '8-22-5' and 'Jewel' had a high incidence of grey pulp.

Due to low yields, large fruit, colour problems and / or the high incidence of physiological disorders, the testing of 'Jewel', 'Nobel', '8-22-5', 'Bonus' and 'Sir Prize' was discontinued after the 2001 season.

Table 2a. Postharvest quality of the new Hass-like cultivars Harvest and Gem, compared with the standard 'Hass' after 28 days storage at 5.5ºC (in 2001). Symptoms are presented as average ratings on a scale of 0 (no symptom) to 3 (severe symptom).

Cultivar	Harvest			Gem		Hass
Date picked	25/07/01	23/08/01	06/09/01	25/07/01	23/08/01	25/07/01
Number of fruit	138	120	55	127	120	139
Densimeter	92.6	94.1	94.0	94.7	94.6	93.5
Evaluation upon removal from cold storage						
Densimeter	88.4	90.9	90.8	89.1	90.3	85.3
Black cold damage	0	0	0.018	0	0.042	0
Lenticel damage	0.710	0.567	0.564	0.614	0.550	0.439
Evaluation when eat ripe						
Skin colour Green (%) Green/black (%) Black (%)	 0 62 38	 0 54 46	 0 2 98	 0 26 74	 1 60 39	 0 19 81
Anthracnose	0	0.008	0	0	0.008	0
Stem-end rot	0.420	0.133	0.255	0.039	0	0.007
Grey pulp	0	0.117	0.036	0.276	0.042	0.468
Vascular browning	0.797	0.517	0.545	0.512	0.642	0.129
Days to ripening	3.3	5.5	5.5	3.4	3.3	3.3

Table 2b. Postharvest quality of the new Hass-like cultivars Nobel, Sir Prize, Jewel and 8-22-5, compared with the standard 'Hass' after 28 days storage at 5.5ºC (in 2001). Symptoms are presented as average ratings on a scale of 0 (no symptom) to 3 (severe symptom).

Cultivar	Nobel		Sir Prize	Jewel	8-22-5		Hass
Date picked	27/06/01	02/08/01	15/06/01	15/06/01	27/06/01	02/08/01	25/07/01
Number of fruit	122	111	107	75	94	86	139
Densimeter	93.7	94.9	n.d.	n.d.	93.7	94.7	93.5
Evaluation upon removal from cold storage							
Densimeter	86.9	86.6	73.7	84.5	86.7	89.0	85.3
Black cold damage	0	0	0.056	0.027	0	0.105	0
Lenticel damage	0.533	0.541	0.009	0.120	0.851	0.942	0.439
Evaluation when eat ripe							
Skin colour Green (%) Green/black (%) Black (%)	 100 0 0	 73 27 0	 0 3 97	 29 58 13	 0 100 0	 0 66 34	 0 19 81
Anthracnose	0	0	0	0.067	0	0	0
Stem-end rot	0	0	0.019	0.173	0	0.023	0.007
Grey pulp	0.639	2.324	0.664	1.333	0.234	1.302	0.468
Vascular browning	0.107	1.297	0.477	0.680	0.979	1.163	0.129
Days to ripening	3.0	2.8	3.2	4.6	6.0	4.0	3.3

n.d. = not determined

CONCLUSIONS

The good results obtained with the cultivars Harvest and Gem in 1999 and 2000 were confirmed in 2001. Cultivars Harvest and Gem matured from July through September and out-performed the other cultivars with regard to yield, fruit size and quality after simulated export. Further testing of 'Harvest' and 'Gem', also in other South African avocado growing areas, is warranted while the testing of all other cultivars was discontinued after the 2001 season.

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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.

WITNEY, G. & MARTIN, G. 1995. Taking the California avocado breeding program into the next century. Proc. World Avocado Congress III: 114-118.