

## **Progress with Rootstock Research at Merensky Technological Services**

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### **ABSTRACT**

The rootstocks Thomas, Barr Duke, D9, G755 and Duke 7 are being evaluated on a semi-commercial basis (100 to 200 trees per rootstock) in the Tzaneen-Duivelskloof area. The potentially dwarfing rootstocks Wilg, Ryan, Colin V-33 are also in the process of evaluation against Duke 7. Because of drought and the early stage of the trials, no recommendations can be made yet.

### **SEMI-COMMERCIAL EVALUATION OF LOCAL AND IMPORTED PROMISING ROOTSTOCKS FOR HASS**

The avocado rootstocks Thomas, Barr Duke, D9, and G755, with Hass as the scion, have been compared to Hass on Duke 7, on a semi-commercial basis since 1989 at one site (Zendelingshoek) and since 1991 at another (Evenrond Farm). However, due to drought conditions experienced in the Letaba District over the last few years, yields from trees in these plantings have been low, and in many cases absent. The vigour of Hass on G755 rootstock was excessively high, confirming previous findings by KremerKöhne & Köhne (1992). This rootstock was therefore excluded from the trial after 3 years. D9 and Barr Duke appear to have lower vigour as rootstocks for Hass when compared to Duke 7, which is in agreement with results reported by Arpaia *et al.* (1994).

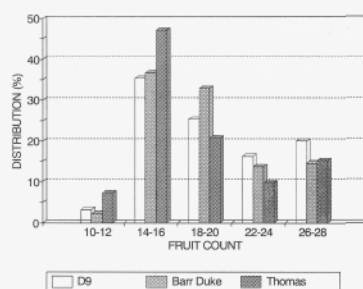
**Table 1**  
Tree size and yield data from semi-commercial plantings of Hass avocado on different rootstocks at two localities.

Rootstock	Zendelingshoek (Planted 1989)			Evenrond (Planted 1991)		
	Stem circumference (cm)		Yield (t/ha)	Stem circumference (cm)		Yield (t/ha)
	1992	1994	1992	1993	1994	1994
Duke 7	31.8 b*	42.8 a	0.25			
D9	27.9 c	39.6 b	0.03	20.8	30.4 b	2.81 a
Barr Duke	28.8 c	39.9 b	0.01	21.3	31.6 a	2.43 b
Thomas	32.9 b	43.3 a	0.37	21.4	32.2 a	2.69 ab
G755	37.2 a	—	0.05			
Level of significance	0.01	0.01		NS**	0.01	0.05
LSD	1.21	1.49		0.68	1.124	0.321

\*Means in each column followed by the same letter are not significantly different.

\*\*NS = Non-significant

For tree size determination, stem circumference was measured, and a summary of these data and yield results of the semi-commercial plantings is provided in Table 1. Analysis of fruit count distribution was carried out for the fruit harvested at the Evenrond site (Figure 1). Although Thomas appears to be performing well in terms of yield and fruit size, 13 trees out of 100 monitored were visibly unhealthy at flowering (yellowing with very little flowering). This may have been due to drought stress, but when compared to the other rootstocks, where only one unhealthy tree on D9 was observed, there is reason not to rush into the use of this rootstock until further evaluation has taken place. At this stage of the evaluation it is not safe to recommend any rootstock other than Duke 7 for Hass.

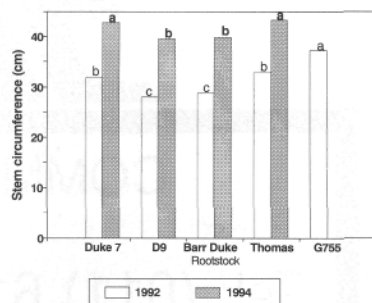


**Figure 1**  
Hass fruit size counts (4 kg cartons) of 500 to 600 kg fruit from each of three rootstocks during the 1994 picking season.

## BIOLOGICAL TREE SIZE CONTROL BY DWARFING ROOTSTOCKS AND INTERSTOCKS

Avocado trees generally grow vigorously and become unmanageably large with time. For this reason, Ryan, Colin V-33 and Wilg (a local Westfalia selection) are being tested as rootstocks, compared with Duke 7, for their ability to limit Hass growth. As a scion, Ryan on Duke 7 displays some constriction at the graft union, leading to the decision to test it as a rootstock for Hass in the hope that it may be less vigorous than Duke 7. Colin V-33, a Mexican selection which has low vigour and a sprawling growth habit, has been used successfully as a dwarfing interstock of Fuerte trees in Mexico (Barrientos Priego, 1987). It was therefore decided to test it as a possible dwarfing rootstock. As far as can be ascertained Colin V-33 has never been tried as a dwarfing interstock for Hass and is, therefore, also being evaluated as an interstock between Duke 7 rootstock and Hass.

Wilg rootstock has exhibited the greatest dwarfing ability thus far (Figure 2). It has also proven to be precocious, with some fruit being borne during the first year (Figure 3), which no other rootstock was able to do. Plant Breeder's Rights for this rootstock have been applied for. There are, however, some difficulties being experienced with its propagation. Colin V-33 as an interstock also produced fruit during its first year in the field, but this may have been due to more mature trees resulting from a longer than usual nursery period, which is necessary for interstocking. Ryan rootstock and Colin V-33 interstock and rootstock, have so far had little dwarfing effect when compared to Duke 7.



**Figure 2**

Tree size of Hass as affected by three potentially dwarfing rootstocks and compared to Hass on Duke 7. Bars with the same letter in each year are not significantly different ( $P = 0.01$ ).



(a)



(b)

**Figure 3**

Hass scion on Duke 7 (a), and Wilg (b) rootstocks. Note the smaller tree size and number fruit of Hass on Wilg rootstock.

At this early stage, no conclusive recommendations can be made. The next phase of testing Colin V-33, a semi-commercial planting of Hass/Colin V-33/Duke 7, is on schedule and will be planted during the 1995/6 season.

## REFERENCES

- ARPAIA, M.L., BENDER, G. & WHITNEY, G. 1994. Avocado clonal rootstock production trial: a view after 8 years. *Subtropical Fruit News* 3: 1.
- BARRIENTOS PRIEGO, A., LOPEZ JIMINEZ, A. & SANCHEZ COLIN, S. 1987. Effect of cv Colin V-33 as interstock on avocado (*Persea Americana* Mill) growth, cv Fuerte. *South African Avocado Growers' Association Yearbook* 10: 62 - 64.
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