

## BETTER YIELDS FROM SMALLER TREES



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### **SUMMARY**

*The ideal avocado orchard should produce high yields from small trees. In order to achieve this aim, present horticultural practices have to be reconsidered. A short review is given of the potential of new horticultural methods for reaching this objective in avocados.*

### **OPSOMMING**

*Die ideale avokadoboord moet bestaan uit kleiner boompies wat 'n hoër opbrengs kan lewer. Om hierdie ideaal te kan verwesenlik sal die huidige tuinboukundige metodes hersien moet word, 'n Kort oorsig van die moontlikhede van sekere tuinboukundige metodes wat aangewend kan word om hierdie mikpunt te bereik, word bespreek.*

### **INTRODUCTION**

At present all avocado trees are grown on vigorous rootstocks and the trees become very large if they do not suffer from root rot. Under good growing conditions old trees reach a canopy diameter of approximately 15 meters. The surface area covered by such a tree exceeds 200 m<sup>2</sup> and the final population is between 40 and 50 trees per ha. To harvest 10 tons of avocados per ha, each tree must yield 12 lug boxes of 18.5 kg each. The same tonnage can be achieved if, e.g. 540 trees each yield one box only.

The advantages of smaller trees (picking, spraying, labour costs, etc.) are obvious. The ideal is therefore to plant more trees. Keep them small and make them bear fruit as soon as possible in order to get early income from such an intensive orchard (Viljoen, 1985). Although this is logical, the avocado industry is still far from reaching this ideal. However, new approaches in avocado growing can be expected to give similar results to those obtained in other horticultural crops.



Fig. 1. An avocado tree suffering from *Phytophthora cinnamomi*

## VIGOROUS VEGETATIVE GROWTH

The avocado tree tends to grow very vigorously. This tendency often interferes with the grower's wish to get a good crop. In the avocado, the balance between vegetative or leaf growth and reproduction or flower and fruit growth is much more sensitive than in most other plants. The avocado would much rather grow vegetatively than reproductively (Robertson, 1971).

As many orchards have been cured of *Phytophthora* root rot or have been planted on tolerant Duke 7 rootstocks, avocado trees tend to grow even more vigorously than before. Furthermore, proper micro-irrigation and weed control assure optimum growing conditions. As a result orchards which were still very sick some years ago have become perfectly healthy, and with that a new era in avocado growing has begun.

2. "Determinate" and "indeterminate" flower clusters of the Hass and Fuerte cultivar were marked. Fruitset and flush elongation ("indeterminate" clusters) were monitored on a weekly basis.



**Fig. 2. A healthy avocado tree growing very vigorously.**

## **RESULTS**

As the project is still under way, final results are not yet available. But as far as can be judged at this stage "determinate" flower clusters lead to a considerably higher fruitset than "indeterminate" ones.

Young leaves treated with Paclobutrazol were noticeably thicker than untreated ones and cupped downwards.

Foliar application soon resulted in retardation of terminal shoot growth. The effect was no longer visible in leaflets emerging two months after application.

Where branches had been tipped, dormant buds nearby started growing and formed new shoots. It is too early to judge the effect of shoot tipping or application of growth retardant on fruitset, as fruit drop is still continuing.

## **DISCUSSION**

Everything seems to indicate that a vigorous first flush of the "indeterminate" clusters is correlated with poor fruitset. We believe that fruitset and vegetative growth compete for nutrients and hormones. Therefore excessive growth results in a high abortion rate of fruitlets.

If this can be established one might, in future, be able to increase avocado yields by decreasing vegetative growth.

## **REFERENCES**

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