

## RESPONSE OF EUCALYPTUS GRANDIS AND EUCALYPTUS SALIGNA TO FERTILIZATION\*

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A fertilization trial on *Eucalyptus grandis* and *Eucalyptus saligna* first planting, was completed after a nine-year period in the Barberton district.

The final results do not show a significant response to fertilization as was the case in the earlier stages of the growth period (Dicks, Jackson & Kirk, 1965; Möhr, Kirk & Dicks, 1968). In fact, the height, diameter breast height (DBH) and volume of the fertilized trees were lower than those of the unfertilized trees.

In contrast, a significant fertilization response can still be noticed after nine years on a similar trial in the Umtata district. The only difference in the two trials, is that the fertilizer treatment levels per tree of the Umtata trial are approximately twice as high as those of the Barberton trial.

A growth comparison (height, DBH and volume) is made between fertilized and unfertilized trees at the Barberton and Umtata sites.

### Comparison of the rate of tree height growth In Barberton and Umtata

The rate of tree height growth for Barberton and Umtata is presented in Figure 1.

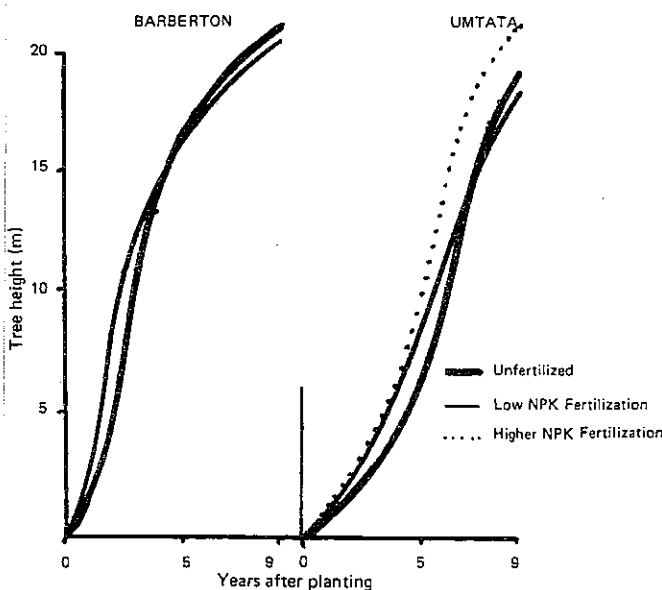


FIG 1 Rate of tree height growth for Barberton and Umtata

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Trees in the Barberton district had a faster growth rate and were also taller than the trees in the Umtata district, at corresponding stages after planting. The low Umtata fertilization level and the high Barberton fertilization level (equivalent to the low Umtata fertilization level) had similar trends. Trees fertilized at the high Umtata level, maintained their significant height increase.

### Comparison of the rate of DBH growth in Barberton and Umtata

The rate of DBH growth for Barberton and Umtata is presented in Figure 2.

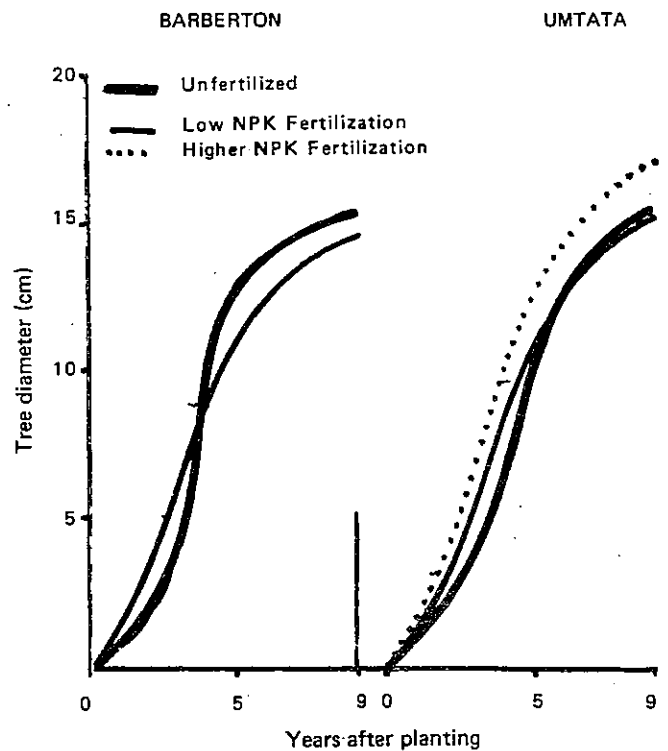


FIG 2 Rate of DBH growth for Barberton and Umtata

The rate of tree volume growth was almost identical to that of tree height. The similarity in response to the low Umtata and the high Barberton fertilization levels can be seen, compared to the response to the high Umtata fertilization level.

### Comparison of the rate of tree volume growth in Barberton and Umtata

The rate of tree volume growth for Barberton and Umtata is presented in Figure 3.

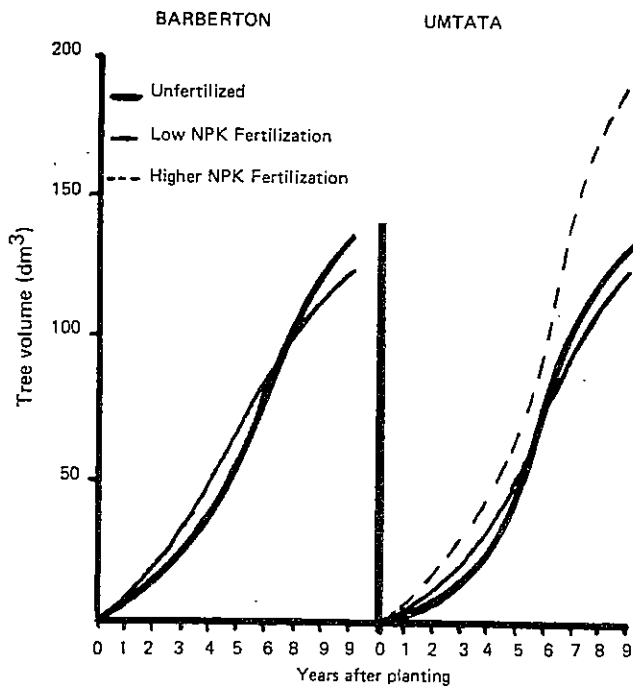


FIG 3 Rate of tree volume growth in Barberton and Umtata

The volume growth rate was approximately the same in Barberton as in Umtata. Once again the low Umtata fertilization level responded similarly to the corresponding Barberton fertilization level whilst trees fertilized at the high Umtata level, maintained their increased growth rate.

According to the Umtata trial, it would appear that the application rates of nitrogen, phosphorus and potassium levels at the Barberton trial were too low for trees to maintain the initial significant response. The growth rate of trees at Umtata, fertilized at the high level, increased by approximately 30 per cent (Ranwell, Kirk & Mullins, 1974). A similar trend was found at Barberton when using a higher fertilization level in the theoretical response equation calculations, based on the experimental design.

New trials are being conducted in the Eastern Transvaal Lowveld to determine the effect of higher fertilization rates on the growth rate of eucalyptus.

### References

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- MÖHR, P.J., KIRK, R.D. & DICKS, H.M., 1968. Fertilization of timber in the Republic of South Africa with special reference to NPK responses from *Eucalyptus* first plantings. Paper presented to Am. Chem. Soc, Sept, 1968.
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