

OBSERVATIONS ON THE EFFECT OF
RE-FERTILIZATION OF PINUS PINASTER
PLANTED ON GREY PEATY SANDS

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A small experimental area (approximately 1 hectare) of Pinus pinaster was planted on peaty sand country on the old Northcliffe Rifle Range area in the 1965 planting season.

The ground which was planted had been either virtually treeless or the scattered small timber had been removed in clearing for the range area or by Group Settlement Scheme farmers, many years ago. Vegetation consisted of scattered groups of paperbark (Melaleuca preissiana), Warren River cedar (Agonis juniperina), and the odd jarrah (Eucalyptus marginata), with a thick ground cover of sand bottlebrush (Beaufortia squarrosa), swamp kangaroo paw (Anigozanthos viridis) and rushes, Restionaceae and Cyperaceae spp.

Site preparation consisted of removal of scrub and debris by burning, followed by ploughing and mounding, which involved the use of a small bulldozer. Mounding was essential in order to be able to plant into comparatively dry ground during the winter months. Pinus pinaster was notch planted on the tops of the mounds in 1965 at approximately 3 m x 2 m spacing. Superphosphate and zinc were applied at the time of planting at the rate of 75 grams per tree.

The survival rate of trees was good and in 1966 a small area approximately 40 metres x 20 metres, on the south-east corner of the plot, was re-fertilized with superphosphate and zinc at the same rate as the original application. By 1968 this small plot was obviously far superior to the main plot, and a side-effect had become obvious with a marked height gradation extending over 2 or 3 trees around the perimeter of the area. Another marked difference was the effect the superior growth of the pines had exerted on the growth of the ground cover, which by this time had become well established over the plot again except where pine growth was sufficiently vigorous to have a limiting effect, that is on the re-fertilized section.

In the light of these observations it was decided to see what results would be evident by re-fertilizing with superphosphate and a range of trace elements (super; super and zinc; super, copper and zinc; super, copper zinc and molybdenum). The remainder of the plot was divided into five strips 75 metres x 25 metres, thus allowing a strip to each treatment and one control strip. As a further test these plots were subdivided and half was grubbed to remove weed competition before manurial treatments were applied (see plan).

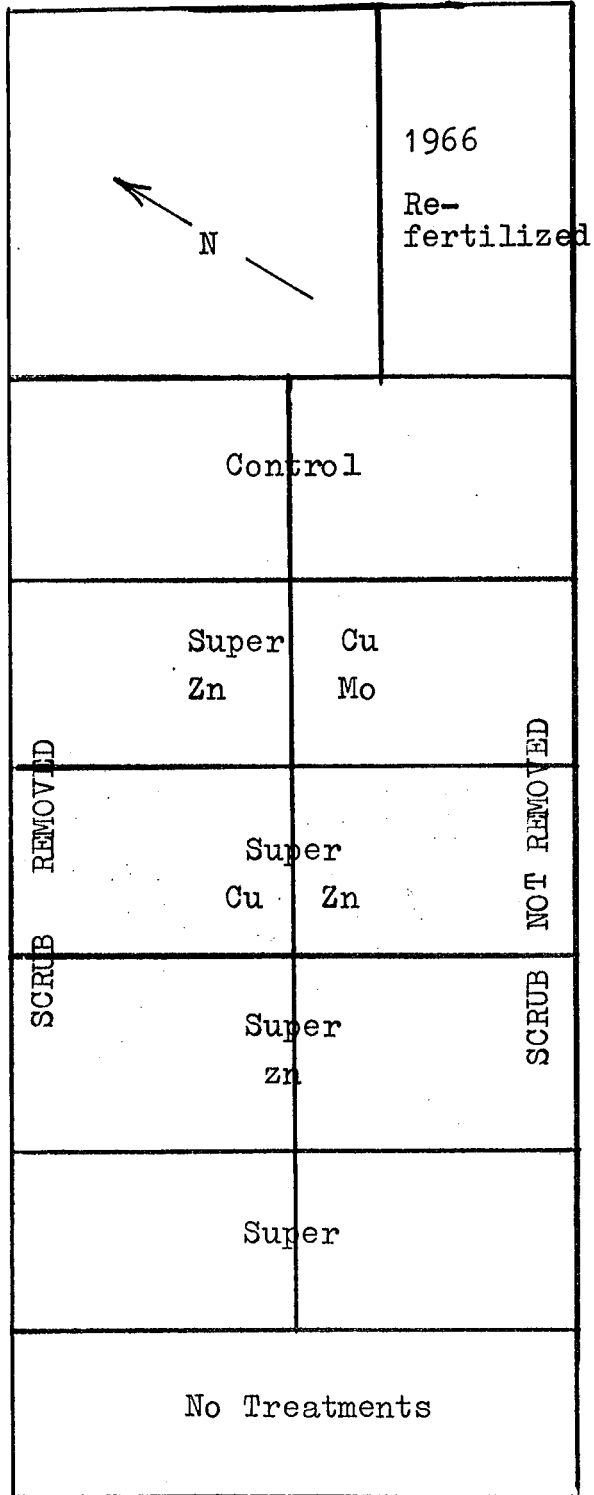
The central 30 trees of each plot were numbered and height measurements taken before any treatments were applied (see Graph 1). Measurements of height growth were made in December 1969, approximately 16 months after the date of inauguration of the trial and these showed definite improvement in the re-fertilized and grubbed sections but virtually no differences in the ungrubbed sections. In February 1974, height measurements were again carried out but in this measurement only 14 trees per plot were measured, equivalent to a spacing of 750 trees per hectare. Diameters at breast height were also measured and a similar pattern was shown (see Graph 2).

Although these figures are not conclusive evidence, owing to lack of replication as a result of the limited area available for trials, certain trends are suggested:

- (1) A second application of fertilizer is beneficial to height growth, providing
 - (a) scrub control is effective, or
 - (b) fertilizer is applied at year 1 or 2 after planting, before scrub competition becomes intense.
- (2) There is a possibility that other trace elements may be needed besides zinc, for example, copper and/or molybdenum.

The benefits gained can be seen by looking at the stand; the trees in the control plot now have a typical unthrifty appearance with tufts of needles on the ends of the branches extending back \pm 200 cm, compared with a comparatively normal needle growth on the treated trees, that is persistent green needles on limbs and upper bole.

Plan of Layout



Scale 1 cm = 8 m approx.

