

The Place of Thinning in Wattle Silviculture and its Bearing on the Management of Exotic Conifers. (Zeitschrift für Weltforstwirtschaft, Bd. 1, Heft 2/3. Tharandt, Saxony, 1934).

By I. J. CRAIB, M.F., Ph.D.

This article, which appeared in the *Zeitschrift für Weltforstwirtschaft*, has attracted much attention. The author is a Research Officer of the Forest Department of South Africa and the article under review is apparently the outcome of a period of investigation of the deterioration of the black wattle (*Acacia mollissima*) stands, which are stated to have yielded £2,000,000 annually from an area of 500,000 acres. This yield of £4 per acre is, however, the value of the manufactured, marketable products, and no information is vouchsafed on the matter which is more interesting to the forester viz., the annual return per acre to the grower for the produce on stump. Forestry has suffered much from such unqualified statements of gross money returns of manufactured produce, which all too frequently conceal an infinitesimal return, if not an actual loss, to the grower of the raw material; and one regrets that the author did not see fit to disclose what proportion, if any, of the £4 per acre per annum was the true forestry or the grower's return. The article, however, deals mainly with silviculture, and the monetary yield was mentioned only incidentally.

The author narrates the standard cultural practice prior to 1928, when dense natural reproduction (or regeneration from sowing) was planted out and thinned to 750—900 regularly spaced trees per acre by the 3rd year and the stand was then left to carry this stand unaltered until the end of the 8 year rotation. His initial experimental improvements followed orthodox lines, e.g., closer initial spacings, soil cultivation and weed control, gradual and continuous thinning. By the use of 400 lbs. of superphosphate per acre, yield improvements of up to 41% of volume per acre at the end of the 7th year were achieved; but dissatisfaction with the vigour of even these improved stands drove the author to attack the problem from a very different angle. Abandoning the orthodox view that the light factor is the paramount factor influencing growth in a wattle stand, the author decided that root-competition for soil moisture controlled the situation and he endeavours to make a case for a general substitution of "tolerance" (defined as capacity of a species for survival, growth and development under overwood of varying densities) for "light requirement" in general silvicultural theory. To the reviewer, the arguments presented are unconvincing and it seems that nothing is to be gained by rolling all of the well known locality factors of orthodox silviculture into the ball of "tolerance." One is willing to accept Dr. Craib's assurance that in wattle orchard practice—for it is surely a degradation of silviculture to apply the term to 8 year rotation work on cultivated soil!—the soil moisture demand controls the situation; but the special case does not justify the general assumption

that the well-worn doctrine of light requirements as the controlling factor in silviculture needs revision. The practical result of the argument is that the recommended thinning practice for wattle is as follows :—

Age	1 month	2 months	6 months	1 year	1½ years
Stems per acre	40,000 or more	1,000	500	250	170

This table alone should suffice to warn any forester that the article deals with horticulture, not with silviculture ; and successful as the procedure may be for wattle culture, the extended application of it to eucalypt and pine silviculture as propounded by Dr. Craib is to be treated with the greatest caution.

As regards eucalypts, the reviewer must class himself as one of Dr. Craib's "few who would care to suggest that there is not a high degree of similarity between the growth of wattles and that of eucalypts." In the footnote to the first page it is stated that the oldest age recorded for wattle is approximately 40 years. Does it not seem that this extremely short life span of the wattle is a fundamental silvicultural distinction between "the growth of wattles and that of eucalypts ?" The short paragraph on eucalypts appears to accept as ideal for the genus the retention of the high increment of early youth right through a rotation to produce "mature eucalypt timber of large size." One would like to hear the views of a forest products officer faced with utilisation problems for such eucalypt timber.

The section on exotic pines has much of interest in fact and figure, but the figures given are so different from any stand of which one has knowledge that criticism or review is dangerous. A stand of *P. patula* (806 trees per acre) was 26 feet high at an age of 4½ years and was in "what appeared to be a vigorous condition." Eighteen months later it was 32 feet high and was "extremely non-vigorous." The figures are beyond those of any stand within New Zealand experience. *Pinus patula* evidently out-radiates *radiata* ; but even so, one may beg leave to doubt the power of even the most experienced eye to detect a change in 18 months from a "vigorous condition" to an "extremely non-vigorous" one when the average height was increased 6 feet in that time, unless the non-vigour was due to an epidemic disease. Arguments drawn from such cases are not conclusive when they are used in an attempt to subvert the doctrines and usages of firmly established practice. The layman and possibly many young foresters will find them specious ; but the forests will suffer if they ever find general acceptance.

C.M.S.