HALF YEARLY PROGRESS REPORT

by J. J. Havel

In the period under review, the final report on site quality studies has been submitted. A summary of the report has been published as a contribution to the 1968 Commonwealth Forestry Conference in New Delhi.

The findings of the study have been applied on a large scale to delineation of future planting areas in the western sector of Wanneroo Division. Future planting areas up to the year 1971 have now been demarcated on the ground through co-operation between research and administrative staffs. Recently taken aerial photographs will be used to map the boundaries.

The methods developed in the Wanneroo Division are now being applied to northern jarrah forest between Julimar and Collie. In addition to suitability for pine planting, the susceptibility to jarrah dieback is also being investigated. There is already an indication that the sites characterised by high proportion of monocotyledons (Liliaceae, Restionaceae, Cyperaceae) are most susceptible to dieback. It appears that poor internal drainage, which limits the growth of many dicotyledenous shrubs, is also the predisposing factor in the case of dieback.

The report on the first stage of nursery research is now complete. The detailed stocktake carried out during the 1966-67 season, was analysed by multiple regression and stratified sampling methods, has yielded much useful information. It has been shown that medium size seedlings, 7 - 14" tall, are the best stock in terms of survival, form and rate of growth. The chief factors affecting the production of planting stock were found to be organic matter, seed stratification and density of sowing. Very marked response has been found to increases in organic matter content of up to 3% - 4% : beyond this point the response is relatively slight. Withdrawal of nursery beds with organic matter content below this level from production, and continuous cropping of beds markedly above this level, have been recommended. Stratification of all seed, and avoidance of stocking above 10 plants per linear ft. of drill have been also recommended. The effect of organic matter content has been shown to be mainly due to its influence on water retention, and to a lesser degree on holding of nutrients against leaching.

Sprinkler irrigation was shown to give much better development of lateral roots and hence better top/root ratio. A minor effect was the lower content of potassium and nitrogen in the seedlings, indicating that irrigation accelerates the leaching of these nutrients.

Partial sterilization of soil with formalin drench resulted in increased numbers and size of seedlings, attributable to better uptake of nutrients from the soil. It also greatly reduced the initial crop of weeds.

Of the four weedicides tried, Grammoxone, applied post emergently was found to give the best control of weeds, but also caused the greatest amount of damage to pine seedlings. Pre-emergent application of Dacthal at 18 lbs./acre gave adequate control of weeds without any injury to pine seedlings, and the highest production of seedlings of suitable size.

Re-examination of the routine kerosene weed control revealed that its decreased effectiveness was due to too low a level of aromatic hydrocarbons in the proprietary brand. Tests of three levels of aromatics and three rates of applications on cool and warm days early and late in spring were carried out. The effectiveness of the treatments increased with the increase in the level of aromatics and in the quantity applied. However, at highest possible level of aromatics severe damage to seedlings occurred later in the season. The aromatic content of 32%, obtained by 80 : 20 mixture of power and lighting kerosene, applied at 70 or 105 galls. per acre, combines adequate weed control with a low level of damage to seedlings and has been recommended for routine practice.

As a continuation of nursery studies, experiments dealing with green cropping and continuous cropping, and with optimum methods of formalin application, have been established in the current year.

A pot trial has been established to study the effect of soil type x fertilization x irrigation interaction on the growth of pine seedlings. A large scale field trial has been established to study the optimum methods of fertilizer application on grey sands. The effects of various forms of phosphate, and of split application, are under study. The possibility of boron deficiency in young plantations is being examined in the light of recent overseas publications.

A recommendation dealing with new method of site appraisal has been submitted following a visit to the Busselton Division, but cannot be implemented due to lack of field staff.

In the field of computer calculations the programme for thinning plots, originally compiled by Mr. McKinnell for P. radiata, has been adopted for use with P. pinaster. The pool of proven computer programmes applicable to silviculture, has been built up to a point when most problems can be handled by this efficient method. Work is in progress on developing a chain of programmes which will handle the full range of operations involved in site assessment on the ecological basis, from processing of field data through the principal component analysis to the graphical screening of indicator species.