

Pine drought

by JOHN MCGRATH

Since the early years of the Blackwood Valley pine plantations, dead tops and some tree deaths have occurred following dry winters.

As early as the summer of 1960-61 the poor survival of *radiata* pine planted in the previous winter was attributed to drought.

Extensive areas of dead tops and tree death occurred in the plantations around Nannup during the 1969-70 summer following the drought year of 1969.

After this drought the introduction of the "Silviculture 70" system of wide-spaced plantations was expected to overcome the problem.

Despite the increased thinning after this change, extensive dead tops and tree deaths occurred in the Blackwood Valley plantations in the 1986-87 and 1987-88 summers following the drought years of 1986-87.

SURVEY FINDS

Two surveys were carried out by forestry research staff from Busselton and Como to

investigate factors that may have helped to cause these deaths.

A broadscale survey examined the influence of soil, plantation and environmental factors on the occurrence of symptoms.

An intensive study of tree health was carried out in Ellis plantation to determine if insects or diseases were involved.

Major site factors that influenced the pattern of symptom occurrence were soil depth, topographical position and aspect.

Shallow soils, upper slopes and north-east facing slopes all increased the proportion of trees showing symptoms. Increasing the density (basal area) of the plantations also led to an increase in symptoms.

Of the insects and pathogens found in the tree health survey, only the bluestain fungus *Sphaeropsis sapinea* and the bark beetle *Ips grandicollis* appeared to be involved.

However, it appeared they were contributing to the decline and death of trees that were severely drought-stressed, rather than being primary causes.

Tree height growth

was related to the same environmental parameters related to the occurrence of drought symptoms.

By dividing the assessment plots into four site classes on the basis of height growth, it was possible to predict the relationship between the basal area before the drought and the basal area remaining after (see below).

Plots classified as site class 1 showed little effect of the drought and increasing the initial basal area had no effect on the proportion of trees affected.

The occurrence of symptoms increased successively from site class 2 to site class 4 and increasing the initial basal area increased the proportion of trees affected.

Development of the system is continuing to determine if it is possible to predict the drought risk before planting and thus predict the stocking that can be carried.

It may also be possible to determine the carrying capacity of current plantations by measuring tree height and thus predict the current site class.

