REGENERATION OF TUART

by

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The bulk of the Tuart forest at Ludlow forms State Forest No. 1 and 2, and has been dedicated for over 50 years. During this time, efforts to foster the establishment of Tuart regeneration, have met with little success.

Quoting from "Forestry in W.A."

"The establishment of seedlings is an haphazard process of which the story is only partly known. Very little regeneration is found in the Tuart forest and has not been apparent for many years.

Seedlings generally die before they reach any appreciable size, and those that survive do so on an ashbed where a heavy pile of debris or a log has been burnt.

With this background, thought was given to the problems of achieving Tuart regeneration. These could be listed as follows:

1. Seed supply
2. Damage from stock in the forest
3. The effect and necessity of ashbeds
4. Competition for moisture and light from

    a) Peppermint understorey
    b) Existing Tuart forest
    c) Native and introduced grasses

5. The effect of fire in achieving regeneration
6. Attacks from insects subsequent to germination
7. The possibility of using artificial means of regeneration

Each of these is discussed in turn:

1. SEED SUPPLY

A general seed year does not occur often and is difficult to predict. Between every fifth and eighth year has been suggested as usual. In the current attempts, an area

was selected that appeared to have sufficient matured capsules containing seed using an ocular estimate. More research into estimating the quantity of seed required to achieve regeneration, appears warranted.

2. DAMAGE FROM STOCK

For many years, grazing leases have been auctioned over the Tuart forest to reduce the fire hazard from native grasses. It was felt that any Tuart seedlings which did germinate, were damaged by stock. This was then proved in an area burnt in 1970. Cattle were excluded from the current trial.

3. EFFECT OF ASHBEDS

Communication with officers conversant with Tuart, indicated that the presence of an ashbed was essential to successful germination. Observations in the karri forest indicate that ashbeds are of great benefit, but not necessarily essential. To achieve the best possible ashbed, all peppermint understorey was pushed down and left broadcast over the area. Tops and other falling debris from Tuart milling operations also was available for burning. The beneficial effect of an ashbed, apart from one of fertilizing, was considered as an aid to eliminate competition from grass and insects.

4. COMPETITION FROM COMPETING SPECIES

a) Earlier attempts at regeneration recorded that germination achieved, did not persist. It was felt that the dense peppermint understorey and remaining Tuart standards created light conditions incompatible with development of the regeneration. Open forest conditions were aimed at.

b) Peppermint regeneration is most prolific after fire in autumn, and to minimize later competition between Tuart and peppermint seedlings, care was taken to push the peppermint while it was flowering to reduce the possibility of mature seed being available in autumn.

c) It was also planned to fall the mature Tuart overstorey once regeneration was established to aid in allowing light to the developing seedlings.

d) Experience with pine planting on the limestone based Wonnerup sands showed that there is extreme competition for moisture in late spring to the extent that many pines died from drought. The curing of native and introduced grasses remove most water from the profile. It was felt that this could be a reason for the lack of success away from ashbeds.

The use of Vorox A.A. sprayed over young pines and tuart open rooted stock, has proved effective. Further work to test the succeptibility of wildlings to Vorox, is needed, together with the optimum time and rate of spraying.

5. THE EFFECT OF FIRE

The use of fire as an aid to achieve a desirable seed bed and in opening all mature seed vessels at one time, is well known.

The test area of 35 acres was burnt with a fire of only moderate intensity on 19.5.1971 (an incomplete scorch of the mature Tuart stand resulted).

An inspection in July 1971, showed very little regeneration, those which had germinated were about 2" high.

A further inspection in November 1971, showed a prolific germination over most of the area, particularly on ashbeds. However, regeneration of smaller height was also achieved away from ashbeds. An average height of 8" was noticed. In January 1971, the seedlings on ashbeds had reached 12-15" (maximum 24"). Off the ashbeds, many seedlings had perished while the rest were unthrifty and up to 4" high. Grass competition was intense.

Theorising, it is felt that spraying of grass during early winter months, will assist.

6. INSECT ATTACK

Generally, the Tuart forest has been completely protected from fire over a very long period. This could be one of the reasons for a build up of a large population of insects capable of attacking Tuart. It was noted that seedlings produced in 1970 trials, subsequently were severely attacked by insects and became malformed. It was also noted that grasshoppers will attack and kill young karri seedlings in the Margaret River nursery. Grasshoppers exist in large

numbers in the Tuart forest.

The area was sprayed with a 0.6% solution of dieldrin in water using a conomist. To date, no insect damage is apparent apart from inaccessible areas missed with the spray.

Leaf curling is apparent here.

7. PLANTING OF NURSERY RAISED STOCK

Some success has been achieved in the past with planting Tuart in plantation type conditions using jiffy potted stocks. However, this method of raising plants would be most expensive if large scale planting was to be undertaken.

In association with the Nannup nursery, trials to raise open rooted seedlings were instituted in 1970. Various methods of root pruning and topping were tried. The seedlings were planted in 1970, and a satisfactory survival rate achieved, particularly with root pruned and topped plants.

CONCLUSION

Once the seedlings produced have survived the first summer period, it would appear that success in establishment could be claimed. To date, they have survived a very dry period in which only 115 points have been recorded since October 1970 (80 points fell in the first half of November).

It is the writers' conclusion that much of the Tuart forest is understocked with Tuart. Two methods of obtaining regeneration have been tested, and from initial results, it appears that either is capable of producing satisfactory results.