REGENERATION BURNING IN KARRI

A COMMENT FROM AN ADMINISTRATIVE FORESTER

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Per Christensen, in the most recent (see page 16) of his excellent series of papers on karri silviculture, discusses problems associated with regeneration burning. His paper is written from the standpoint of the silvicultural research officer, so a comment from an administrative officer may, perhaps, be of interest.

Before making this comment, I might take the opportunity to briefly describe current procedures involved in karri regeneration, for the benefit of officers who may not have visited or worked in the karri in recent years. The steps can be summarized as follows:

1. Selection of Cutting Areas. Since the advent of clear-falling, pure karri types only are now being cut. Karri-Marri and Marri-Karri stands are completely avoided.
2. Treemarking. This involves selection of seed trees, the spacing between which varies slightly according to predictions of seed supply. About 3 chains between seed trees is aimed for.
3. Trade Cutting and Cull Falling. Millable logs are removed and cull trees felled.
4. Srub Rolling. Advanced karri regrowth, Casuarina and scrub species are rolled flat by a bulldozer. Debris is cleared from around the bases of seed trees and a tanker track constructed around the proposed burn if existing roads are not suitably located. Scrub rolling is done a minimum of six months before burning.
5. Edging. Where possible, spring edging is carried out, but there are certain difficulties in this operation. Not the least of these is the fact that the scrub-rolled areas, one usually finds that as soon as the edge lights, the whole area will go off. Edging outside the burn is desirable but frequently impossible in karri-marri types which will not dry out sufficiently to burn, anyway, until about Mid-December. Normally, early edging outside the burn is only possible when the area abutts jarrah and jarrah-marri types.
6. Regeneration Burning. The burn itself is carried out either in December-January (i. e., "Spring" burning) or March-April (Autumn burning). The fire is an extremely intense one and requires a major fire organization to cope with it. This involves the full complement of Fire Boss, Sector Bosses, Gangs and Dozers. Northern officers can appreciate the situation best by

imagining their plantation clearing burns, dotted with 200' tall trees right up to the perimeter, carried out in mid-summer and adjoining areas of 12 tons plus per acre fuel.

7. Regeneration Surveys. Burnt areas are surveyed and mapped for germinant numbers and distribution in the spring following the burning season. On the basis of these surveys, areas are classified as "Successful", "Require Planting" or "Require Repeat Treatment". The great success with karri wildling planting in recent years and the normal high degree of fire damage sustained by seed trees in the burn has given rise to a school of thought opposed to classifying areas in the 3rd category. It is probable that very little repeat treatment of regeneration areas will be done in future. Most D.F.O.'s now accept that some wildling planting will be necessary every year.

8. Removal of Seed Trees. Seed Trees are removed in the first two years after the burn. Extremely close supervision of the operation is necessary to ensure adequate protection of seedlings from logging machinery. Most contractors are now well disciplined and perform this operation most skillfully. The average bush workman has become highly interested in the regeneration process and even takes a pride in "his regen".

Of the 4000-odd acres regeneration burnt in the Pemberton Division in the 1968-69 period only 65 acres required planting. Seed Tree removal is completed and the sea of lush green seedlings now about 6 feet tall is a gratifying sight. Total costs are usually less than $20.00 per acre.

To return to the main point of Mr. Christensen's article: problems associated with the regeneration burn.

In the latter stages of a seed cycle, the D.F.O. is presented with two vital questions - (i) assuming seed supply is adequate, should he burn in spring or autumn? and (ii) assuming seed supply is doubtful, should he burn at all or hold until the next cycle?

Dealing with the second question first, I believe the correct decision is to burn rather than hold. In the Pemberton Division alone, roughly 3000 acres are cut-over each year and one is faced with some 6000 acres of regen burning every 2 to 3 years. Therefore unless you are really sure that the seed supply is totally inadequate, you must burn. The result, with a below-average seed crop, will certainly be disappointing and involve expenditure on planting. But this is preferable to the alternative which involves sitting on large areas of cut-over bush, often already scrub-rolled and carrying up to 30 tons per acre of fuel, for up to 4 years - and on top of that, being faced with double the acreage of burning by the time the next crop ripens. Other factors, such as crown deterioration and

wind throw of seed trees and accelerated white ant attack of seed trees must also be taken into consideration.

If the necessity to plant arises, planting must be completed by the end of the 2nd winter after the burn. Otherwise massive scrub development leads to both increased planting costs and decreased growth rate on the planted seedlings.

With respect to the question of when to burn, the D. F. O. has 4 opportunities to programme this work:

(a) Autumn of Summer 1
(b) Spring of Summer 2
(c) Autumn of Summer 2
(d) Spring of Summer 3.

Of the above, there is little question that utilization of (b), but more particularly (c) leads to the best results. Nearly all the evidence, from current silvicultural research to simple observation of past burns, indicates that the best time to burn is in the autumn of the second summer the seed is ripe. However, there are two "administrative" problems which must be weighed against the silvicultural desirability of this season. Firstly, the Autumn burning season in the karri region is notoriously unreliable. The opening rains in March can continue into the closing rains of winter, leaving one with virtually no burning weather at all in Autumn. Secondly, the Autumn burning season is our worst for "cocky fires". Fires out of control on private property or fires escaping into State Forest from private property average about 6 per year for the autumn burning season at Pemberton. Autumn fires are both more difficult to contain and more time-consuming to mop-up than spring fires. Year after year we find ourselves so involved in these suppression operations that the autumn burning season slips away before any serious control burning or regen burning can be attempted.

Therefore if you gamble on getting all your regen burning done in the desirable Autumn of Summer 2, and then for reasons of weather or suppression problems you miss out - then you are faced with having to do all your burns in the spring of Summer 3 with only 40-50% of the seed crop left in the crowns, and nothing left at all if you miss this one.

For these reasons I feel that the D. F. O. should aim to get at least 50% of his proposed regen burning completed by the Spring of Summer 2. ("Spring" is, of course, rather a misnomer, because the burning is normally done under season-extension in January). This usually means curtailment of the spring control burning programme and calling on additional manpower in the form of northern gangs, dragged kicking and screaming from their fire

gang competitions. Then, every effort must be made to complete the programme by the end of the next autumn.

On the other hand, it is recognized that the innovation of the scrub-rolling technique has allowed some regeneration burns to be done immediately after the first rains in March or April because the bulldozed scrub and debris will, unless saturated, still burn fiercely. There is a gap in our knowledge on the subject of the fire behaviour of scrub-rolled fuels and some work in this field may reap dividends.

CONCLUSION

To achieve a successful marriage between the silvicultural ideal and the practical reality is one of the challenges of the administrative forester. In the field of karri regeneration it could probably be fairly said that two are at least engaged at this stage. The high quality of work coming out of the Manjimup Research Station combined with the enthusiasm of our field staff and men makes this undoubtedly the most exciting and interesting field in West Australian hardwood forestry at the moment.

There is little doubt that there are still problems associated with the current system - a small percentage of our regeneration burns are still destined to be failures. However, I consider wer are in front at the moment and with further work on the most vexing and significant of our problems, the successful prediction of seed supply, further progress must come.