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The Editor,

"Forest Notes",

PEMBERTON

Boronia and Spring and Autumn Burning

Dear Sir,

Further to the Report on Boronia by J. A. Thomson in Forest Notes Vol. 8 No. 2 (June 1970), the following may be of interest.

Early in May 1970, F. R. O'Leary accompanied by Mr. R. Bowra of Plaimar Ltd. located some small Boronia plants approximately 6" to 9" high in a swamp South of the Old Griffin and Wyvern mines near Collie.

The area had been burnt in April 1969 but some patches remained unburnt and it was in one of these patches that the plants were growing.

No sign of small seedlings germinated by the Autumn 1969 burn could be found.

Prior to the burn in 1969 the area was burnt on the 6/10/66, this being a fairly hot burn, and it was this spring fire which successfully germinated the Boronia.

Yours, etc,

P. N. Shedley.

PINES OR APPLES?

by

Roger Burke.

Recently a study was carried out in the Donnybrook area to compare costs and returns from Pinus radiata and Granny Smith apples.

This was done from the point of view of an orchardist with about 30 acres of spare land, suitable for orchard and therefore, also suitable for P. radiata.

In view of the complex nature of the subject a certain number of assumptions have to be made to avoid becoming too involved.

The method used was to obtain Capital, Maintenance and Production costs for both crops, over a full rotation, - taken as 40 years for both.

The figures quoted on orchards are average figures based on actual costs and returns from a number of orchards in the Donnybrook area; and the pine figures are current Forests Department figures at Grimwade.

If the farmer decides to grow apples, he will go as far as picking the crop. From there it is handled by the packers. If he grows pine, he will sell the timber standing, to be removed by the buyer.

Being an orchardist he already has a tractor, plough, irrigation equipment, spraying equipment etc.

A. COSTS

Are covered under Capital, Establishment, Maintenance to initial Production and Production costs.

CAPITAL

APPLES			PINES		
Tractor	2600/2	$1,300	Tractor	2600/2	$1,300
Plough	1500/2	750	Ploughs	1500/2	750
Rotary Hoe	500/2	250	Tractor Firefighter		400
Spray Plant	1600/2	800	Chainsaw	300/2	150
Fork Lift	400/2	200			
Irrigation Equipt.	1200/2	600			
Sundries	600/2	300			
30 Acres		$4,200			$2,600

OR $140 /acre OR $86.67/acre

Items shown divided by 2 are items he would already have for his orchard

ESTABLISHMENT/ACRE

Cost of Plants	75	Cost of Plants	11.50
Cost of Planting	20	Cost of Planting	11.00
Fertilizer	3	Fertilizer	
Rabbit Fence	100	Rabbit Fence	100.00
	$198		$122.50

MAINTENANCE/ACRE/YEAR To First Production - *Not Annual

8 Years		13 Years	
Cultivation	19	Fire Breaks	0.50
Pruning	30	* Pruning 1	1.00
Irrigation	25	* Pruning 2	1.00
Spraying	50		
	$124		$2.50

$124 x 8 years = $992/acres $2.50 x 13 years = $32.50/acre

PRODUCTION/ACRE

Irrigation, spraying, fuel labour packing, freight & cartage, cool storage, repairs and maintenance. Licence, Insurance Commission and Levies and Depreciation Capital.	$614	Fire Breaks Controlled Burning Depreciation on Capital	0.56 1.00 5.50 $7.06
$614 x 32 years = $19,648		$7.06 x 27 years = $194.26	

TOTAL COST PER ACRES OVER 40 YEARS

Capital	140	87.00
Establishment	198	122.50
Maintenance	992	32.50
Production	19,648	194.26
	$20,968	$436.26

B. RETURNS

(1) APPLES

Apples are in the main bought from the growers by the Packing Companies, of which there are about six. The grower picks the crop into 30 bushel bins which are picked up by the packers from the orchard.

They then sort, grade and pack the fruit. The grower receives so much per case from which the packers deduct fees for cartage and packing.

At the sheds the fruit is sorted for three markets - Export, Local and Processing at a ratio of 75%, 20% and 5% respectively,

The order of cash return is Export - $2.68/Bushell
Local - $3.06/Bushell
Processing - .45/Bushell

This varies considerably each year.

As the average tree in this area produces 3 bushells per year and there are 100 trees per acre this gives and average yield of 300 bushells per acre/year.

300 Bushells per acre/year	Export	75% -	$603.00
	Local	20% -	$183.60
	Processing	5% -	$ 6.75
			$793.35/acre

(2) PINES

The price paid by sawmills for pine will affect the value of the returns considerably.

It is hard to set a price that would be obtained because insufficient pine is bought by local mills. The prices used in this study are prices paid in the round in Perth, less deduction for freight from this area.

Prices

4" - 7" Logs - $ 6.00/load
7" - 9" Logs - $ 9.00/load
9" - 15" Logs - $12.00/load

PINE RETURNS BY THINNINGS

Thinning	Loads Acres	4" - 7"	7" - 9"	9"+	Return
1. 13 years	30	100%			30 x 6 = $180
2. 20 years	30	50%	30%	20%	15 x 6 = $ 90 9 x 9 = $ 81 6 x 12 = $ 72
3. 28 years	45	10%	20%	70%	4.5 x 6 = $ 27 9 x 9 = $ 81 31.5 x 12 = $378
4. 35 years	50	10%	10%	80%	5 x 6 = $ 30 5 x 9 = $ 45 40 x 12 = $480
Clear Falling 40 years	80	10%	10%	80%	8 x 6 = $ 48 8 x 9 = $ 72 64 x 12 = $768
					$2,352

Thus the return/acre over 40 years is $2,352 or $58.90 acre/year.

	APPLES	PINES
Total Return over 40 years	$25, 387	$2, 352
Total Costs over 40 years	$20, 968	$ 436
Net Profit per acre over 40 years	$ 4, 419	$1, 916
OR Net Profit per acre/year over 40 years	$110. 50	$48. 00

C. CONCLUSIONS

However as the costs are incurred over a period of 40 years and the returns are received over the same period this reduces the actual value. For example in the case of the return from Apples of $25, 387, this figure discounts back at 5% to $9, 007.

This means that $9, 007 invested now at 5% would amount to $25, 387 in 40 years time.

Thus the discounted profit per acre is - Apples $350/Acre, Pine $255/Acre over 40 years. OR Apples $8. 75/acre/year, Pine $6. 30/acre/year.

PROFIT PER DOLLAR INVESTED

APPLES	PINES
$0. 04	$0. 89

However there are other factors to be considered when viewing these figures. Some of these are as follows:-

(a) For the purpose of this study, it was assumed the land to be planted was pasture. If it was native forest, clearing costs would be higher for orchard than for pine. Orchard $150/acre, Pine $65.

(b) To establish and maintain 30 acres of orchard, to first production, would cost $39, 900 compared to $7, 200 for a plantation.

(c) Pine planting might not be acceptable to a small investor in view of the longer wait for first returns, and subsequent waits between thinnings.

(d) In discounting back costs and returns in this survey, the figure of 5% was used. Using different percentages would make big differences to the figures obtained. It is hard to state a definite figure, and here, 5% was taken as an average. The pine costs are current Forests Department costs at Grimwade, and the returns are prices paid in Perth for round pine, less freight costs from this area.

(e) The future market from pine seems to be fairly certain in view of the rising consumption of softwood in this state. More certain in fact that the future for apples.

(f) It was assumed in this summary that the methods of silviculture used in the pine plantation would be the same as currently used by the Forests Department.

However, a farmer may wish to use different methods.

LAKE MARINGUP - A RISING LAKE

F. J. Bradshaw and S. J. Quain

Following reports of some years standing, that there were cut karri stumps visible well out into Lake Maringup, we visited the lake in early April to investigate further.

Lake Maringup is a fresh water lake of about 320 acres and is situated about 15 miles south of Northcliffe between the Gardner River and the Deeside Road and about two miles inland from the south coast. To the north of the lake is flat country interspersed with karri "islands" and pockets of low jarrah country. To the south are stabilised sand dunes carrying peppermint and with odd areas of karri. To the east of the lake is a large area of swamp country, much of which is under water in winter. (See figure 1 for a sketch of the area and general drainage patterns.)

A track joins the lake at the north west corner and from this point we were able to see that there were indeed stumps in the lake. The water level was probably as low as it has been for some time and a number of stumps, about fifty in all could be seen along the northern shore. They started about a chain from the shore line and extended out to about five chains. The top of the stumps protruded about two feet above the water line and at this point were six feet and more in girth - some appeared from a distance to be about nine feet in girth.

In attempting to reach the nearest stump it was discovered with great surprise and to Steve Quain's extreme distress that the water was not in fact six inches deep as it appeared, but six feet. Apart from the surface layer of clean water the rest was a suspension of vegetative matter of the appearance and consistency of pea soup. This was something of a set-back but with the aid of a tractor tube to which a tarpaulin had been lashed the nearest stump was eventually reached. This stump was about six feet in girth, about six feet in height, of which four feet was submerged. The stump had in fact rotted off at the usual water level. Examination of the sample taken indicates that the species is Warren River Cedar (Agonis juniperina). This could be expected but nevertheless the girths of the stumps are a good deal larger than are commonly found. It was not possible with the craft at our disposal to reach the other stumps through the ooze. However an attempt was made from the southern side where the lake bottom was quite sound and water clear. After paddling about two thirds of the way across we were again turned back by ooze. From this vantage point more stumps could be seen along the northern shore. The interesting feature of this part of that the portion of the lake we saw appeared to be little more than six feet deep.

The conclusion must be drawn that the lake has risen at least six feet in very recent times since although cedar will grow very close to waters edge it never grows even in shallow, permanent water. One can also conclude that

because the deeper portion of the lake is only a little over six feet, then the area of the lake has also increased considerably in recent times.

The reason for the rise in water level provides opportunity for speculation.

The most likely possibility for such a dramatic rise would seem to be that something has occurred to alter the drainage pattern to cause an increase flow into the lake. Since there has been only minimal activity of any sort in the area by man a natural cause must be suspected. In examination of aerial photographs to determine the drainage pattern into the lake a most interesting feature was noticed about three miles south east of the lake. At this point a flat ends abruptly in a vee shape pointing in a southwesterly direction and surrounded on both sides by steep stabilised dunes. A narrow gully continues in this direction for about 10 chains. A short saddle about 5 chains long stops it here, but beyond this a narrow gully again continues for about 5 chains before opening up into a flat. This flat opens up to about 10 chains in width with steep dunes on both sides before entering a non stabilised drift about 10 chains from the shore-line. This feature has every appearance of a substantial creek system which has been blocked by a sand drift. This theory is further enhanced by the fact that the dune across this point has a completely different appearance on the aerial photos and would appear to be much younger than the dune immediately south of the Lake. The boundary of this dune is shown in Figure 1. (It seems almost certain that the lake at its original level was produced by the older dune to the south and west of the lake.) If this supposition is true then it means that the catchment of the lake has been increased by some 1 - 2,000 acres. It would be difficult to establish an accurate figure in this regard because the blockage could well have caused some of the flow to be diverted to another main stream flowing easterly across the Deeside Road.

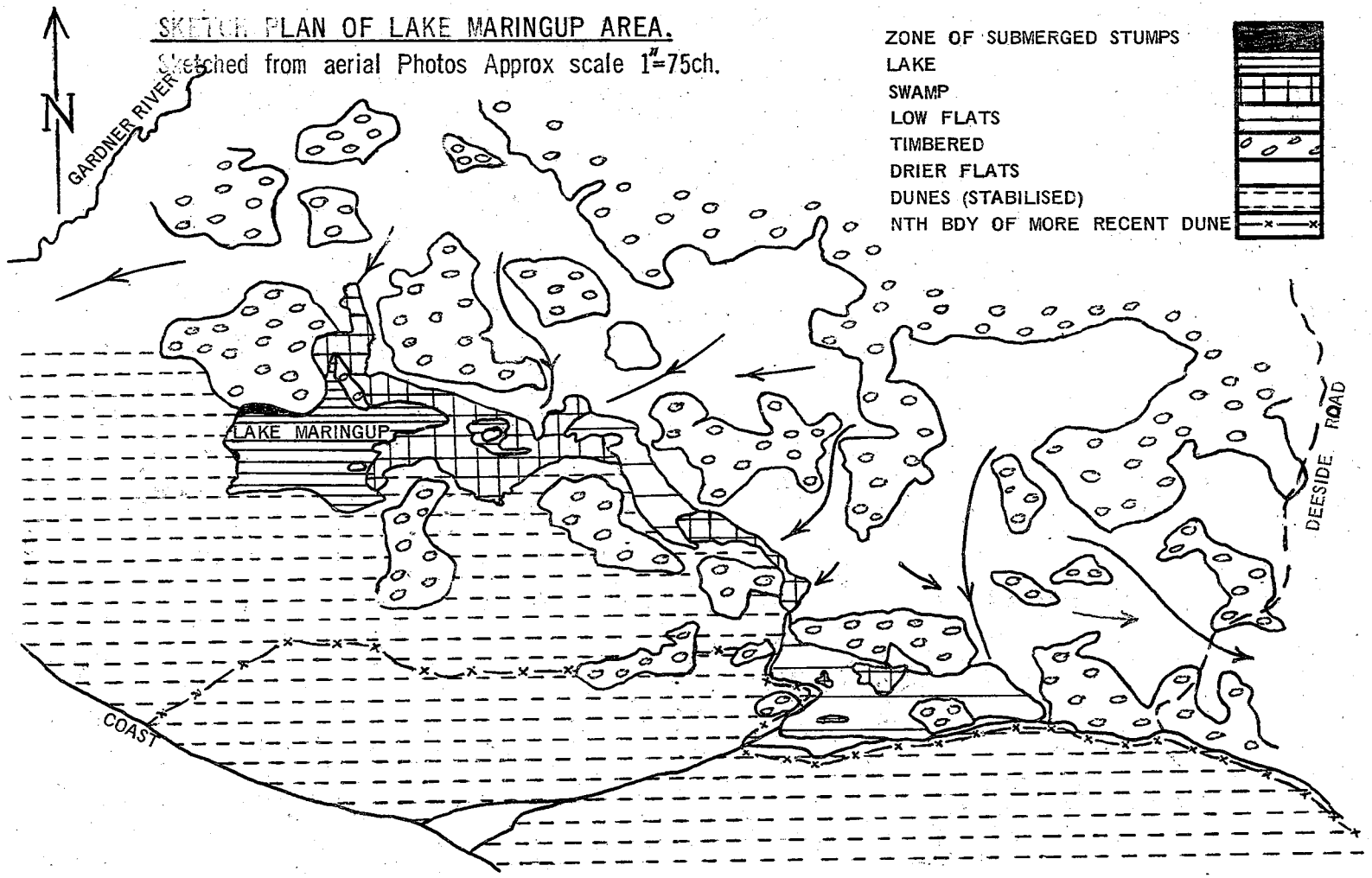
At least that's one theory, what's yours?

Further investigations in the lake and the dunes would be well rewarded in this truly fascinating area. Equally interesting is the abundance of bird life, the association of karri and yate growing to within feet of the lakes edge, and the beauty of the lake itself.

However a noteof warning to any would-be naturalists - Beware the ooze!

SKETCH PLAN OF LAKE MARINGUP AREA.

Sketched from aerial Photos Approx scale 1"=75ch.



EFFECTIVENESS OF WASHING-DOWN PROCEDURES.

by

F. Batini and J. Cameron

INTRODUCTION

Results from a previous study have shown that the equipment commonly used in the Jarrah forest may carry large volumes of diseased soil for considerable distances. The potential for initiating new infections varied greatly between the units tested. Where transfer of logging units from diseased to healthy areas becomes necessary, washing down with a high pressure hose has been recommended. As the effectiveness of this technique has not been tested under operational conditions, it was decided to investigate the quantities of soil carried and spread by washed equipment and to compare these results with those obtained using unwashed units.

METHOD

The tests were run on the following units:

1. Caterpillar D7 Tractor.
2. Caterpillar D4 Tractor.
3. Michigan Tractor Shovel (fitted with fork lift arms).
4. Bedford 7 ton tip truck (one set of duals).
5. Chevrolet 15 cwt. ex. Military truck.
6. Land Rover (Short wheelbase).

The soils were loams in plantation areas not affected by P. cinnamomi. Each of the units was bogged in a wet creek crossing and then moved onto a nearby road. They were then thoroughly washed by the driver using one of the standard Heavy Duty pumper units. Where necessary, large clods of earth were chipped away with a crowbar and the units moved forward so as to wash the remainder of the tracks.

The washed units were then walked or driven in second gear for seven chains along a gravelled road. A 50% sample (one track) of all soil falling onto the road was collected, air dried and weighed. At the seven chain mark, any readily removable soil was collected into bins, the unit was washed and scraped thoroughly and the soil removed collected on a tarpaulin. This was subsequently air dried and weighed. The tests were run in the same localities and using the same units as those used in the previous study involving unwashed equipment.

RESULTS

The weights of soil carried and dropped by different types of washed equipment are shown in Table 1. For comparison, the weights carried by unwashed equipment are shown in Table 2.

TABLE 1.

WEIGHT OF SOIL (AIR DRY) CARRIED BY DIFFERENT TYPES OF EQUIPMENT, AFTER WASHING WITH A HIGH PRESSURE HOSE.

UNIT	SOIL WEIGHT ON UNIT AFTER WASHING (lbs.)	SOIL WEIGHT LOST BETWEEN 0 AND 7 CHAINS (lbs.)	SOIL WEIGHT ON UNITS AT 7 CHAINS (lbs.)
Caterpillar D7	160	6	154
Caterpillar D4	105	9	96
Michigan Tractor	0.5	0.1	0.4
Bedford 7 Ton Truck	0.2	0.1	0.1
Chevrolet 15 cwt. Truck	Nil	Nil	Nil
Land Rover	Nil	Nil	Nil

TABLE 2.

WEIGHT OF SOIL (AIR DRY) CARRIED BY DIFFERENT TYPES OF UNWASHED EQUIPMENT

UNIT	APPROXIMATE SOIL WEIGHT ON UNIT AT BEGINNING (lbs.)	SOIL WEIGHT LOST BETWEEN 0 AND $7\frac{1}{2}$ CHAINS (lbs.)	SOIL WEIGHT ON UNIT AT 10 CHAINS (lbs.)
Caterpillar D7	1629	172	1457
Caterpillar D4	697	357	340
Michigan Tractor	181	45	136
Bedford 7 Ton Truck	270	260	10
Chevrolet 15 cwt. Truck	26	19	7
Land Rover	12	3	9

These tables indicate the very substantial weight of soil which can be removed by thorough washing with a high pressure spray. In the case of the D7 and D4 respectively, the weights of soil retained after washing were 10% and 15% of the original soil weights on the unwashed units. With the rubber tyred units, less than half a percent of the original soil weight was retained after washing.

Washing of the D7 was completed in 75 minutes, the D4 in 30 minutes and all rubber tyred units were washed in less than 15 minutes.

DISCUSSION

Once again, the data presented should be used to obtain trends rather than quoted as absolute values. Some soil loss occurred in the washing and collection processes, but these losses were not large and would not materially alter the trends obtained.

Overall, washing down greatly reduced the weight of soil retained on these units and, as a consequence, would reduce their ability to initiate new centres of infection in areas of healthy forest. Rubber tyred units were relatively easy to clean due to their construction and their height off the ground. In contrast, the D7 and D4 retained a considerable weight of soil after wasing. Tracked equipment is difficult to clean completely due to the collection of soil in locations such as under the track adjustment spring covers, the top of the engine and transmission underside protection plate, the track shoes and the area around the track pins.

Nevertheless, washing has reduced the weight retained by these units by between 85 and 90% and the actual weight of soil falling onto the road was reduced by over 95%. The greater percentage retention observed with the D4 is probably due to its smaller size which created difficulty in access whilst washing.

The high pressure wash was carried out by the unit's driver. In a number of cases, some readily removable soil on the treads, the rear of the dozer blade and the track pins was missed in the original washing process. It is considered that these results would be quite typical of a reasonably thorough wash carried out under operational conditions. Minor structural modifications to some of these units should be considered, so as to reduce the weight of soil collected and assist the washing process.

CONCLUSIONS

1. A washed caterpillar tractor will still carry some diseased soil, but is much less likely to initiate new infections than is an unwashed tractor.

2. From a hygiene viewpoint, rubber tyred logging units are to be preferred. These units will collect less soil, are more efficient at self cleaning and are much easier units to wash thoroughly.

3. Minor structural modification to the tracked units should be considered in order to facilitate the washing process.

4. Washing down should only be used where absolutely necessary. It is much more efficient and less costly to plan the operation so as to avoid cross travel rather than to rely on washing as the only hygiene measure.

5. To be effiecient, washing down must be carried out conscientiously and large clods should be chipped away with a bar.

It would be preferable to wash tracked units on boards, moving the unit forward during the washing process so as to clean the portion of the tracks previously in contact with the ground. The unit should then be moved one or two chains in order to dislodge any soil missed in the washing process and this soil should then be removed by a short rewash. Using this technique it should be possible to remove over 90% of the original soil on even the most difficult units.

ACKNOWLEDGEMENT

The writers wish to thank the D. F. O. 's and staff of the Mundaring and Dwellingup Divisions for their assisstance with this study.

DOUBLE TIERED CANOPY

by

T. H. Wood.

In the Kelmscott Division three totally different areas of planting are normally in progress at one time. These are located approximately 20 miles West of Jarrahdale at Peel Estate where Pinus Pinaster is planted, 5 miles North of Jarrahdale (Rehabilitation of areas mined for Bauxite) planted with both Pinus Pinaster and various species of Eucalypts and 20 miles South East of Jarrahdale on the Albany Highway adjacent to Mt. Cooke where Pinus Pinaster is planted.

The Pines are transported from Gnangara and the Eucalypts from Hamel. Due to the distance involved and the limited carrying capacity of the normal truck it has sometimes necessitated the use of two trucks each day to meet the demand for plants at all three areas.

The eliminate the use of two trucks, a double tiered canopy was designed and built at Jarrahdale. This then doubled the carrying capacity of one unit to approximately 75,000 pine plants per trip depending on the size of the plants. This then decreased the need to travel to either Gnangara or Hamel each day so that the one truck could travel to each centre on alternate days.

The canopy has been designed to fit a truck with a tray approximately 8' wide and 15' long with a finished inside height of 6'1" to allow the average person sufficient room to work at a comfortable height. Another requirement was that the second tier was designed to fold up out of the way allowing walking access to the full length of the truck body.. The total length of the truck was divided into 4 sections lengthwise and 2 sections in width for convenient loading and unloading, raising and lowering of each tray by one man. The individual trays are held in the up position by straps mounted on the top support rail of the canopy.

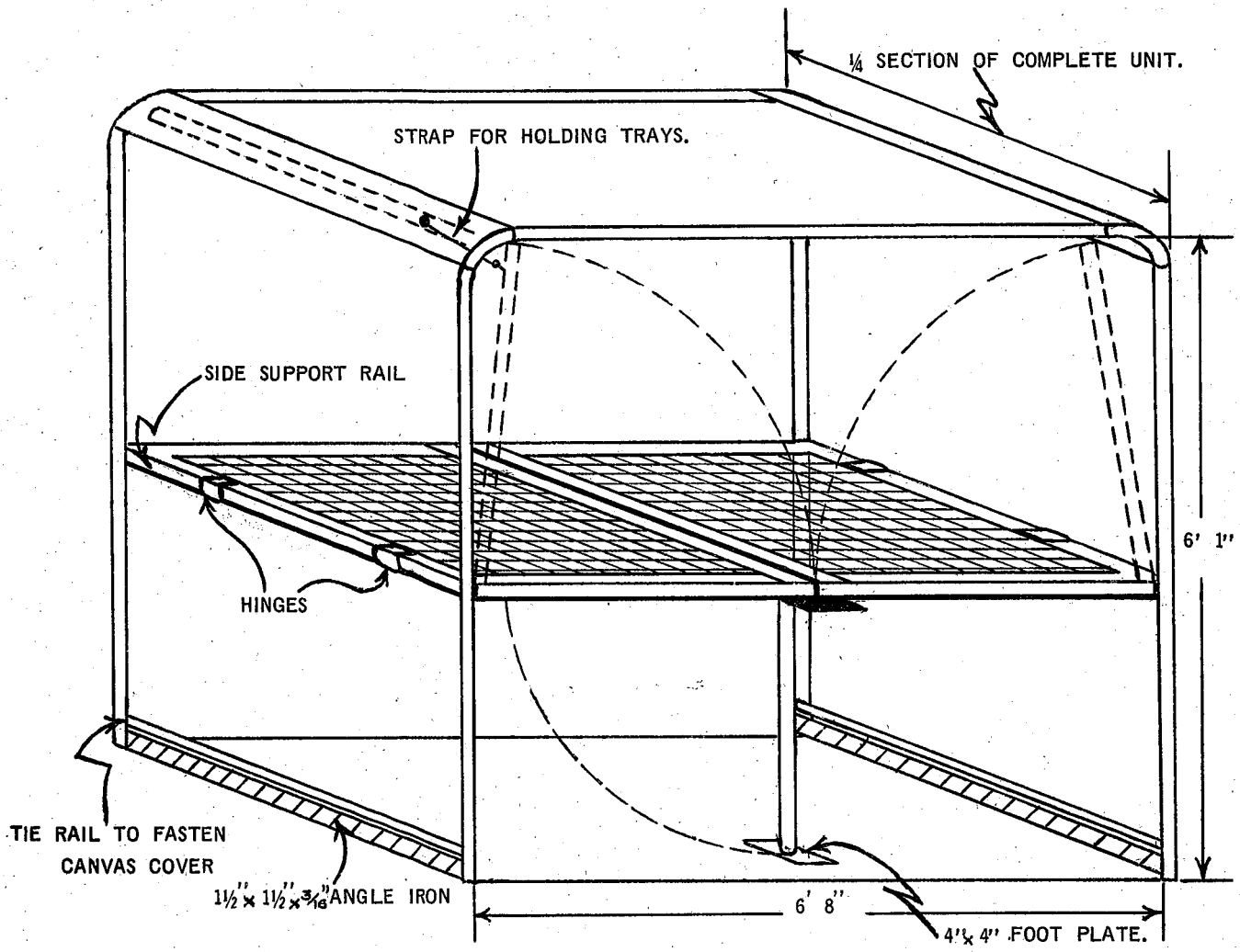
The frame of the canopy is 1" black steel piping shaped and welded to $1\frac{1}{2}$" x $1\frac{1}{2}$" x 3/16" angle iron which is in turn bolted to the truck floor. Each tray is covered with reinforcing mesh for strength and lightness and easy cleaning. Each tray is then individually fastened to the side support rail with post and gate hinges and supported in the middle of the double span by a support leg which also folds out of the way when the trays are folded upwards.

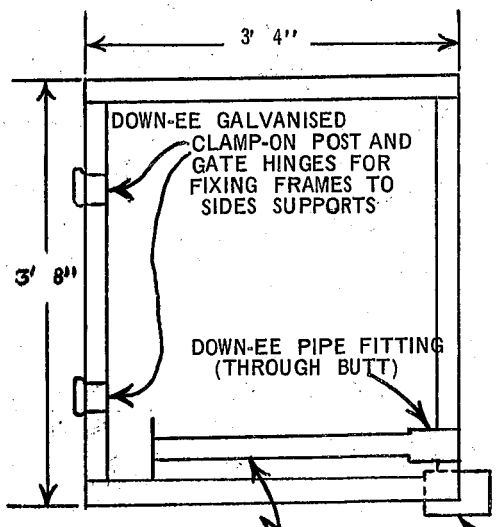
The Jarrahdale Canopy was successfully used during the 1969 planting season.

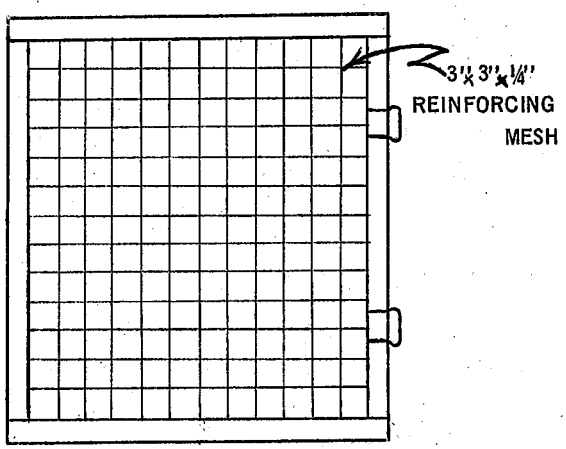
A similar unit has now been built in the Wanneroo Division for use at Gnangara during the 1970 planting season.

DOUBLE TIERED CANOPY

JARRAHDALE







SCALE 1" = 20"

T. H. WOOD.

REGENERATION BURNING IN KARRI

by

P.S. Christensen.

I wish to make it quite clear from the start that this article only examines Karri regeneration burning from the silvicultural point of view. No consideration has been given to any of the management factors that may affect the problem.

Karri is regenerated by leaving seed trees and burning in a seed year. The burn, if reasonably hot, causes total seed fall within a few weeks (see fig. 1). It also creates favourable conditions for germination.

There is usually a period of two to three years without seed, between Karri seed years. The quality of consecutive seed crops also varies considerably.

Also under the clear-felling system far fewer trees are left standing than was the case when the group selection system was in use. These factors have necessitated a greater knowledge of seed supply. A system currently in use (see Ref. 1) allows predictions of future seed years and their quality. The forester can then plan accordingly, i.e. breaks can be prepared in advance around areas it is wished to regenerate. If a good seed year is forecast, the normal 1 to 1.5 trees per acre should provide sufficient seed for successful regeneration. It is also possible to prepare for seed collection during good seed years. If a mediocre seed crop is forecast it is wise to leave slightly more than the usual 1 to 1.5 seed trees per acre to ensure success. If a poor seed year is forecast, it is possible to make preparations for artificial regeneration if this is desired.

Thus preparations for regeneration burning can now be made two to three years ahead with much confidence as we are ever likely to achieve under the present regeneration system.

But the problem of which season to burn in still remains. The situation as regards seed supply is illustrated in Fig. 11.

Fig. 1. SEEDFALL IN KARRI STANDS AFTER BURNS OF VARYING INTENSITY.
Seed crop was approximatly the same in all areas.

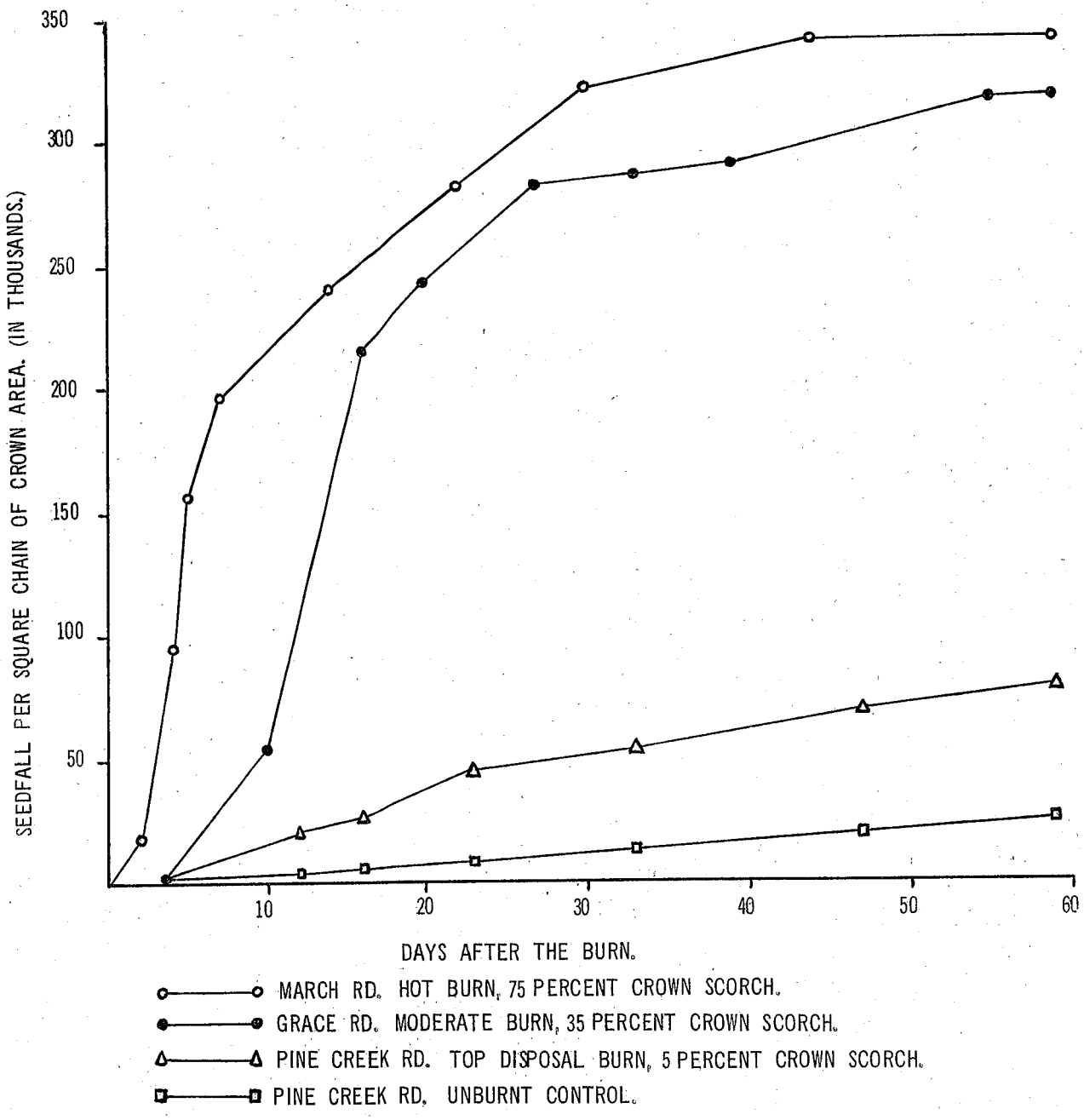
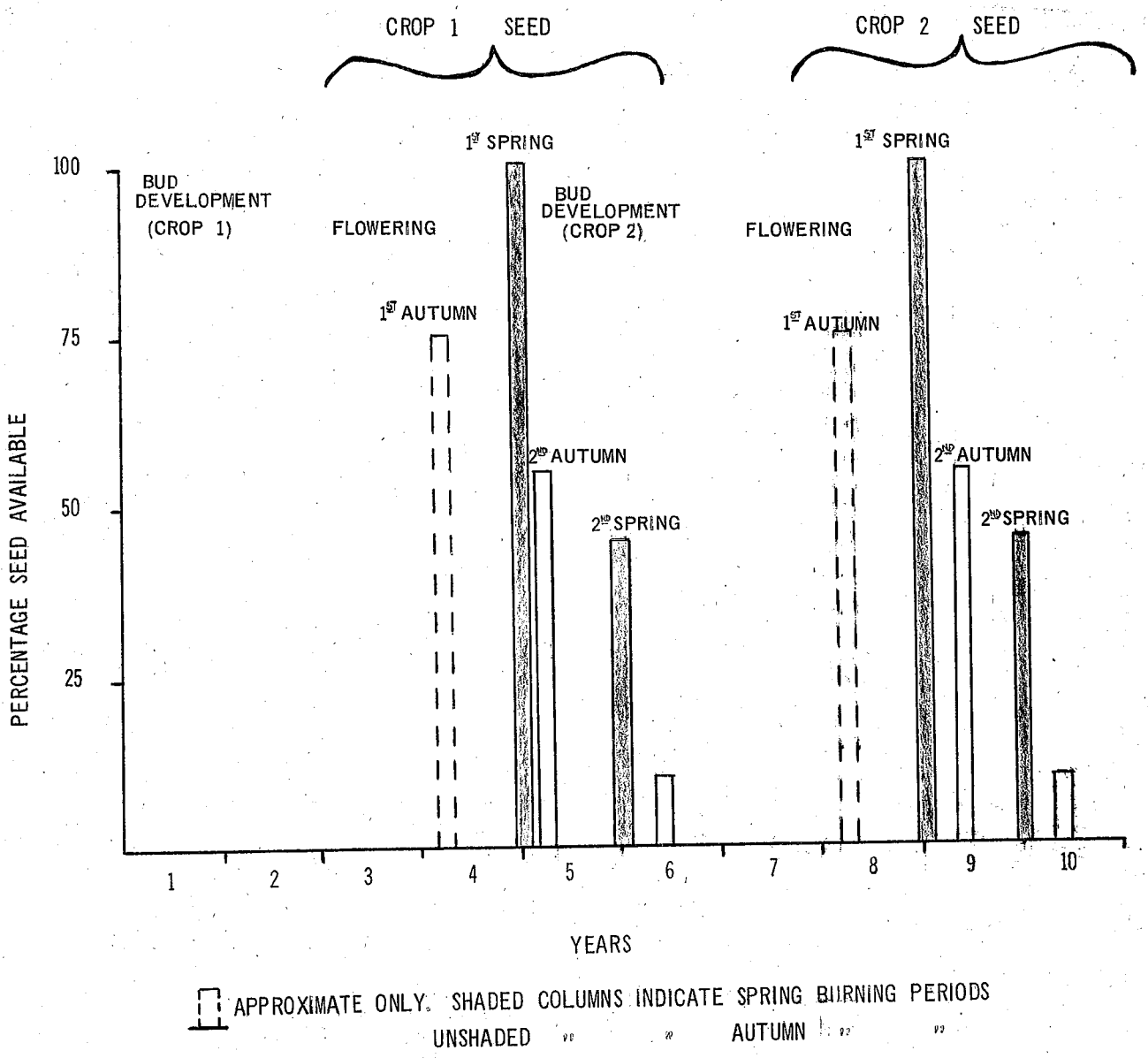


Fig. 2. RELATIVE AVAILABILITY OF KARRI SEED FOR TWO HYPOTHETICAL CROPS DURING REGENERATION BURNING PERIODS.

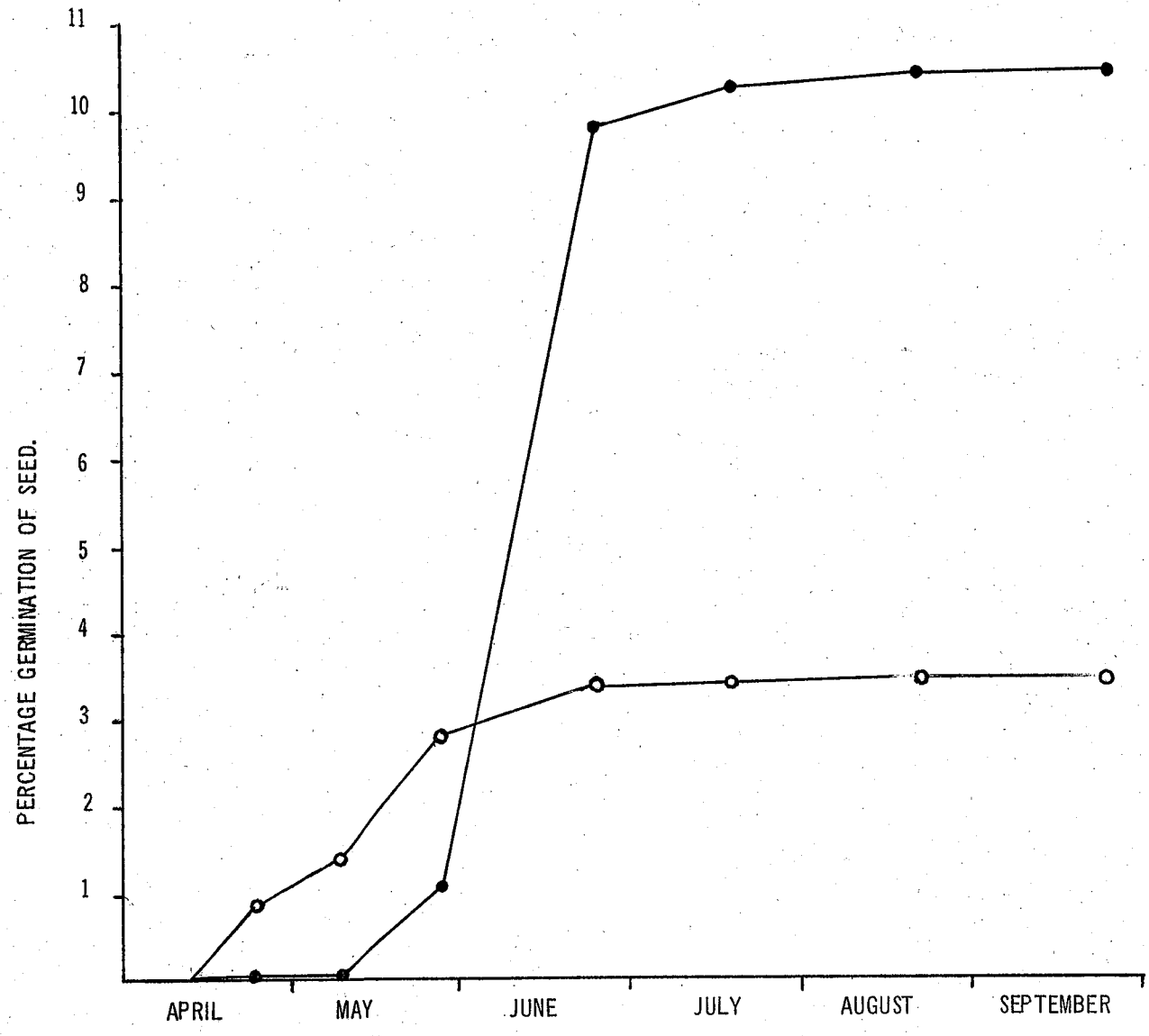


Two crops are illustrated in Fig. 11. Small crops sometimes develop between the main crops, but these seldom reach maturity. If they do then they tend to merge with the main crop. In the first autumn of a crop, it is believed that approximately 75% of the seed only is ripe. This is not yet certain and needs to be confirmed. In the first spring all the seed is ripe., and the maximum amount is available for regeneration. 45 - 50% of the seed is shed over the summer, so that by the second autumn only 50 - 55% of the seed is available. A further 10% may be lost over winter so that only about 40 - 50% is left by the second spring. Most of the remaining seed is shed over the second summer. The best time to burn would then appear to be during the 1st spring or 2nd autumn of a crop. The 1st autumn, if investigations bear out our present beliefs, would also be a good time to burn. Crops are seldom large enough to allow successful burning during the 2nd spring since a large seed supply is required for spring burns. *

*Spring burns 120, 000 seed/acre. Autumn burns 80, 000 seeds/acre.

However it is not that simple. Autumn sown seed in a well replicated trial last year gave 160 - 180% better germination than spring sown seed (see Fig. 111).

Fig. 3. GERMINATION OF SPRING AND AUTUMN SOWN KARRI SEED. MARCH ROAD PLOT.



* GERMINATION OF AUTUMN SOWN SEED IS DELAYED BECAUSE IT WAS SOWN AFTER THE FIRST RAINS, ON 10 / 4 / 69.

AUTUMN SOWN SEED, 10 / 4 / 69

SPRING SOWN SEED, 21 / 1 / 69

DIFFERENCE SIGNIFICENT AT 0.01 LEVEL.

The poor performance of spring sown seed is attributed to the activities of insects over summer, since dieldrin treated seed shows significantly improved germination.

Autumn burning then, even though 45 - 50% of the seed has been lost over summer, should prove better than spring burning. i.e. A 90 -100% improvement in autumn sown seed will make up for the 45 - 50% loss over summer. This is amply made up for by the 160 - 180% gain in germination achieved with autumn sown seed. The 2nd autumn should thus be the best time to burn, and if it is confirmed that 75% of the seed is ripe by the 1st autumn, then this will be by far the best time to burn.

After detailed investigation it has been found that accurate estimates of seed supplies prior to regeneration burning are difficult to achieve. Seed fall has been found to vary by 50 - 60% from the estimated figure. In some cases poor results have also been achieved even though adequate seed was available. This appears to be due to some physical characteristic, as yet unidentified, of certain soils. Because of this it is extremely important to try to burn under the most favourable conditions. A certain percentage of failures is inevitable under the present system, however it pays to reduce this percentage as much as possible, as failures present a number of problems.

Because the seedlings are not big enough earlier it is not usually possible to do a regeneration count till early spring, (see Fig. 1V).

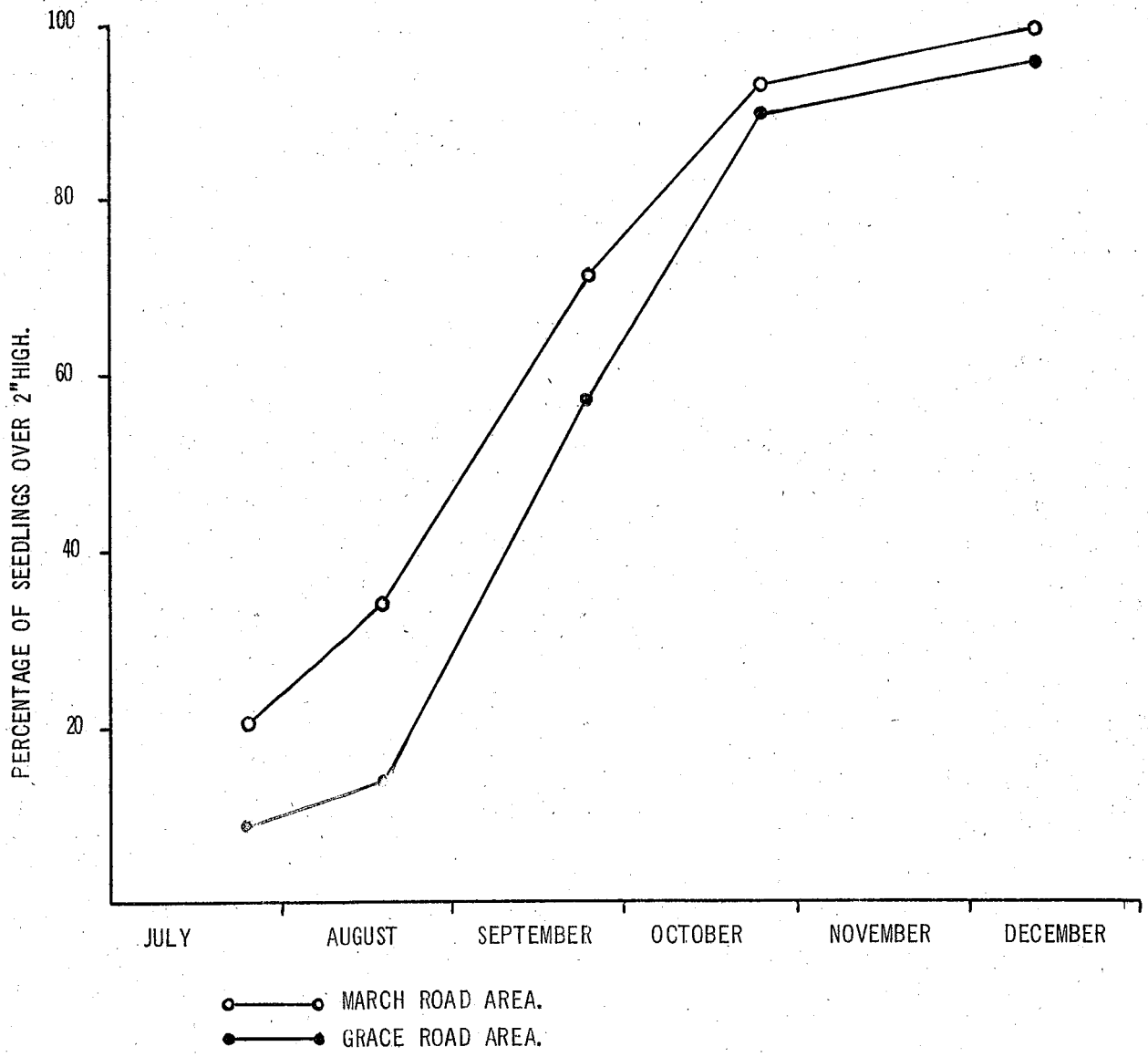
This means that if the area is a failure it cannot be artificially re-stocked till the next winter. The result is a scrub problem. If Karri is planted into scrub it has difficulty suppressing it and may remain 'scrub bound' for some time. Spraying can of course be carried out, but this is an expensive procedure.

Thus from this point of view it pays not to burn unless satisfied that the result is going to be satisfactory. However, not burning in a seed year means planting or leaving the area till the next seed year. As can be seen from Fig. 11, the next seed year is likely to be two to three years away. This time wasted is expensive in terms of lost growth. It could also mean that the area would have to be scrub rolled before it could be burnt.

Thus there is not simple answer to the question, "Shall I burn now or wait?" It is virtually impossible to guarantee success with a seed tree system of regeneration. However, the chances of executing a successful regeneration burn can be increased by proper utilization of the available information on seed crops and germination.

A certain percentage of burns are still destined to be failures, and a certain amount of artificial regeneration will always be necessary.

Fig. 4. PERCENTAGE OF KARRI SEEDLINGS OVER 2" HIGH ON TWO REGENERATION BURNT AREAS IN 1969.



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REGENERATION BURNING IN KARRI

A COMMENT FROM AN ADMINISTRATIVE FORESTER

R. J. Underwood

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.

ROADSIDE SCRUB CONTROL

by

O. W. Loneragan.

Further to a letter received from the D/F. Pemberton, the following notes may also help other if circulated through Forest Notes.

Information of value in practice obtained in the initial experiments show:

1. Economic control with chemicals is obtained best during the first dry season following burning and regeneration of the weeds.
2. 2, 4, 5-T Ester at $2\frac{1}{2}$ lbs/acre ($2\frac{1}{2}$ pints, 80% concentrate) controls the main fireweeds, Acacia and Bossiaea sp.
3. Thorough wetting of foliage is important:
   - 3.1 The best dilutant is water, and the addition of the wetting agent Superior Summer White Oil or Plus 50 is essential at 1:80 (2 oz/gal.).
   - 3.2 The mixture is applied at the rate of performance of the machine. This is measured:-

$$\text{Gals/ac.} = \frac{43560 \times \text{gallons used}}{\text{area sprayed (length x width)}}$$

$$\text{Gals/min.} = \frac{\text{gals/ac x strip width (feet)}}{\text{speed m.p.hr.}} \times \frac{\text{speed m.p.hr.}}{495}$$

   - 3.3 One acre is covered by a strip eight feet wide by one mile long.
4. Eradication is not practicable, and control of scrub requires follow-up treatments:
   - 4.1 In rotational burnt areas, reburning and respraying, until the composition of the weeds at the roadsides has been changed, mainly to monocots and herbaceous dicots.
   - 4.2 In regeneration areas, two runs in opposite directions (between one and two times faster than speed of application in one direction) is recommended for most reliable control of weeds, rather than spraying from one direction only.
   - 4.3 Slasher control of scattered large woody scrub where necessary, supplements chemical control methods.
5. Important factors in costs are machine and operator efficiency. - Low volume mist spraying is feasible at a reliable minimum of about 10 gals/acre at

present, with total costs at less than $1 per gal in the supply of the materials and the application of the mixture.

6. Motorised misting of the foliage of the above fireweeds (**), indicate reliable performance (*), at 2% or 2½% 2, 4, 5-T, operating:
   6.1 Solomister at 10 gals per acre (or per mile (*) per hour) with 5 refills of the 2 gal. tank each (half pint of 2, 4, 5-T of 80% concentrate, and 4 oz. white oil) misting at 1½ feet per second along the roadside. Add refilling time; and alternate operators when refilling to remove fatigue.
   6.2. Omnimist tank of 200 gals (with 5 gals of 2, 4, 5-T of 80% concentrate and 2½ gals of white oil) misting to the limit of 5 m. p. h. along the roadside covers 6 miles per tankful or 9 acres of 12 foot strip (*). Add refilling time.

Note - (*) 1. Effective width of control is half the distance of penetration of misting.
2. The hormone is volatile, must be directed downwards to the roadside edge, and applied on calm days or in light air movement less than 5 m. p. hr; and not within two hours of rain.

(**) For control of resistant broad leaved species, (hazels and eucalypts) the concentration of the 2, 4, 5-T needs to be increased up to 4% pending improvements in efficiency.

Control by hand methods only by slashing, cost $20 per mile/acre, four feet wide on both sides of the treated roads in 1959-60. Without increasing cost over ten years, $20 of chemical spraying from 1970, may be expected to provide from 2 or 3 times the width of the treated roadside, in strips from 8 to 12 feet wide: these strips will last longer and require less frequent retreatment than slashing only.

Most important is the safety and protection, provided in maintaining clear vision for travelling along the forest roads.

BUSHFIRES, BRUSHES & ROOS -

A STUDY OF AN AERIAL BURN.

P. C. Kimber.

INTRODUCTION

There has been some criticism, both by spoken word and in the press, of the Forests Department burning policy. In particular the ignition of large blocks of forest from the air has caused grave concern among a sector of wild-life enthusiasts.

What happens to the larger animals in an aerial burn? Are they killed? Do they escape? Are they injured? In an attempt to answer at least some of these questions the Dwellingup research section conducted a survey before, during, and after an aerial burn in Dwellingup division that covered an estimated area of 16, 000 acres.

The burn was started at 11. 40 a. m. on 10 October 1969, and by 2. 00 p. m. the whole area had been lit in strips 14 chains apart. The area was located to the eastern side of Dwellingup division and included good to mediocre jarrah forest and some fairly extensive flats.

ANIMAL POPULATION BEFORE THE FIRE

An estimate of the number of animals in the area was made one week before the burn. All the tracks traversing and some bordering the area were covered by Landrover with a spotlight between 7. 30 p. m. and 10. 45 p. m. The total distance travelled was 1, 950 chains (24. 37 miles) and a strip 4 chains either side of the track was covered by the light. This gave a total area of 1, 560 acres, and in this area 11 grey kangaroos and 19 black gloved wallabies (brush) were seen. It was estimated by simple proportion that the population of the 16, 000 acre block was of the order of 113 grey kangaroos and 195 brush.

ANIMAL MOVEMENTS DURING THE FIRE

At 10. 00 a. m. on the day of the fire 8 men were stationed on the track bordering the eastern, windward edge of the area to be burned. Each man was positioned to have a great a length of track visible as possible. A total of 3, 920 yards (2. 23 miles) of track was kept under observation in this way. The total boundary length of the area was 28. 5 miles, so in fact 8% of it was covered by the observers.

Observations were confined to the windward side of the burn for two reasons. Firstly, ignition was to be started on the leeward side and the boundary on that side would rapidly become obscured by smoke. Secondly, there was considerable activity by fire suppression patrols on the leeward side. This was expected to cause some disturbance, and the presence of observers there was likely to hinder the suppression patrols in their work.

The observers maintained their positions until the fire was within two or three chains of them. The number of animals seen leaving the burning area and the time and manner in which they left was recorded.

A total of 8 kangaroos and 1 brush was recorded leaving the fire in sight of the observers. The first kangaroo left the area at 1.05 p.m. when the nearest line of fire was 500 ~~years~~ YARDS away. It loped out in a leisurely manner following a pad. The rest of the kangaroos were recorded as leaving between 1.45 and 2.10 p.m. when the fire was from 200 yards to within 50 yards of the boundary. In most cases they were moving fast and not apparently using well worn pads. The solitary brush moved out at high speed when the fire was about 50 ~~years~~ yards from the boundary.

An estimate of the number of animals leaving the area can be made on two different bases. If it is assumed that they were able to leave the burning area anywhere along the whole boundary of 28.5 miles, then the observers covered 8% of the possible exits. By simple proportion the estimate of animals leaving the fire is 100 kangaroos and 12 brush. A more likely assumption is that due to smoke, disturbance, and to the pattern of ignition the majority of animals would leave by the 15.0 miles of windward boundary. The numbers leaving on this basis are estimated at 54 kangaroos and 7 brush.

It was concluded that half to two thirds of the grey kangaroos left the burning area while only a very small proportion of the brush did so, possibly less than 5% of the number in the area. In no case was any injury observed.

POST-FIRE INSPECTION

By 4.00 p.m. on the day of the burn it was estimated that about 40% of the area remained unburnt and was unlikely to burn. It was planned to light up the unburnt patches by hand on the following day. Those doing the burning were asked to watch out for animals, and particularly for any dead or injured ones. A number of kangaroos, brush, and pig were reported, none showing any sign of injury and all well inside the boundaries of the aerially ignited block.

DISCUSSION

The exercise was disappointing in that the burn was far from complete. 40% unburnt area represents a vast haven for animals to move into from the fire, and it seems likely that most of the brush population did just this.

The only conclusion that can be drawn from the present study is that it is extremely unlikely that any mortality or injury to the larger animals resulted from this particular fire.

Further studies are planned for next burning season. If a 100% burn is achieved, then the area will be sampled a week or 10 days after the burn with dogs to detect any corpses.

MANJIMUP REGION

Staff

Frank McKinnell has resumed duty with the Department as Silviculturist at Manjimup Research Station.

Jim Shugg, recommenced at Pemberton following 2 years National Service.

Dick Speldewinde is back with W. P. O., Manjimup after $8\frac{1}{2}$ years spent in the Northern Territory.

K. A. Phillip-Jones and G. J. Jenkins joined the staff of Manjimup W. P. O. as Junior T/A's.

Additional T/A's at Manjimup Research are G. Liddelow, C. Ward and J. Pearce.

Transfers:

John Kitt to Dwellingup Research.
Ron Kitson to Northcliffe as Assistant Forester.
Jim Loverock to Pemberton.
Frank Townsend to Busselton.

Transfer of Shannon River Settlement to Walpole is practically complete. Divisional operations have been conducted from Walpole since July.

BUSSELTON REGION

Staff

(1) Forest Ranger Colin Bradbury resigned on the 10th June.

Mrs. Paula Raper resigned on the 31st July. .Both Officers are from Kirup Division.

(2) Forest Assistant John King retired on 24th July and a buffet dinner was held on that date attended by some 30 officers associated with Mr. King. Mr. King is going on an extended trip to the eastern states and is retiring in Perth. F/A Frank Townsend has been transferred from Pemberton to take his place.

UTILIZATION

(1) Grimwade Sawmill is now operating on a piecework basis and the No. 1 bench is producing 0.8 loads of sawn boards per hour, The baulk bench which has been on a Piecework Basis for three years produces baulks at the rate of .9 loads per hour.

(2) Structural Grade P. radiata or Glulam has been produced at the Keenan Mill for use in laminated beams and trusses for Bunning Bros.

(3) Logging in the Nannup Plantation has recently recommenced after a break of about 10 months. All material is being sent to Westralian Plywoods. The operations is being conducted by the Company through a sub-contractor (R & N Palmer).

(4) A 100 acre area of pine in the Blackwood Valley which had failed due to grass competition in the summer 1969-70 was replanted in 1970. The area was sprayed with Vorox using a Cessna Pawnee aircraft at a charge of $1.25 per acre. The aircraft flew between 30' and 50' above the ground over one in three slopes and coverage appeared excellent. It is hoped to employ a aeroplane to spray Euccalyptus succers on the steep country this season. This would greatly reduce the cost of the operation and would eradicate the ill effect of diesel sprays on the operators skins.

RECREATION

(1) The Nannup Golf Day was held on 26th July. Apart from one very heavy shower in the afternoon, conditions were pretty good. The main event was won by Alf Wetherly from Nannup and the runner-up was Lyn Marshall on a count back from Bill Buchanan.

The ladies competition was won by Betty Grace (her fourth success), on a count back from Pat Phelps. The teams event was won by the Nannup Division. The afternoon tea, barbecue and keg, were very well received and topped off a successful day.

METRO REGION

Staff — Charlie Kelers has moved from Mundaring to become D. F. O. Dwellingup.

Ian Scambler has transferred from Harvey to become A. D. F. O. Mundaring.

Charlie Broadbent has transferred from Carinyah to Collie.

John Hawkins has transferred from Mundaring to Jarrahdale.

George Barham has transferred from Narrogin to Pemberton.

Equipment — A mounding plough designed and built in Queensland has been used effectively for wet site preparation in the Kelmscott Division. With the use of this machine it is also hoped that more efficient use of wet sites in the Bassendean Sands at Gnangara will be possible.

Agricultural Economics

One of the lateral effects of a slump in the agricultural economy is the marked fall-off in sales at the Narrogin nursery. This nursery produces some 100,000 plants per year, principally for inland farmers, who were of course, affected by the 1969-70 drought and it is expected that there will be a big carry-over this year.

Survival Counts

One recent customer at Narrogin wants his plants ready for delivery in late August. When it was suggested to him that survivals might be poor he explained that he also planted in late August 1969 and did have a few deaths, possibly due to the drought. Closer investigation revealed that from 200 plants used, two deaths were recorded.

Late Les O'Grady.

It is with deep regret that I report the passing of Les O'Grady on Saturday August 1st. 1970 at the age of 62 years.

Les will be long remembered by those who knew him both within the Department and among the general public, for his friendly personality and eagerness to get on with the job.

He joined the Department as an apprentice in January 1924 and worked in several Divisions in the far South before coming to the Metropolitan area.

In recent years Les has been involved with pine log supplies to Metropolitan mills and with fire control in the Metropolitan plantantions.

At one stage when his two sons were still in their teens the O'Grady fire fighting team became quite famous in Collier plantation. Indeed hundreds of plantation fires were put out by Les and his sons, having been spotted from his hill top home in Todd Avenue.

A large gathering of past and present foresters attended the funeral and it was appropriate that Les is buried beneath a spreading titree.

WORKER SAFETY 1969-1970

Practical safety awareness throughout the Department continues to grow and on the completion of this, our third year of intense accident prevention activities, an all time low safety record has been achieved.

During the year 70 disabling injury accidents occurred resulting in a frequency rate of 37 and a time loss of 721 mandays.

These figures compare favourably with 96 disabling injury accidents last year for a frequency rate of 48 and a time loss of 1701 mandays.

A number of divisions have achieved excellent results in reducing their frequency rates from that of last year.

Outstanding performances were those of Dwellingup and Harvey.

Dwellingup worked a period of sixteen months, February 1969 - May 1970 accident free and were within two days of making it seventeen months when unfortunately a workman was fatally injured by a falling limb.

Harvey has now worked a period of nine months D. I. A. free for a total of 200, 132 man hours and appear certain to reach the coveted quarter million accident free manhours. Congratulations are extended to both Dwellingup and Harvey, and to all other divisions who by their efforts have played a big part in reducing the incidence of injury accidents to an all time low.

The divisional summary appears on page 39.

From a combined review of the above summary, divisional accident investigation reports and S. G. I. O. forms 1 it is apparent that those divisions that have made little or no progress during the past year have yet to realise the success that results from management control of the worker - Particularly the injured worker. An article on this extremely important function of management appears elsewhere in this edition of Safety News.

As already mentioned we are now enjoying a record low disabling injury frequency rate. However many accidents necessitating medical attention are still occurring, and greater co-operative efforts will be required during 1970-71 to reduce our all injury incidence still further.

Remember - Safety is no accident.

The life that is saved may be yours.

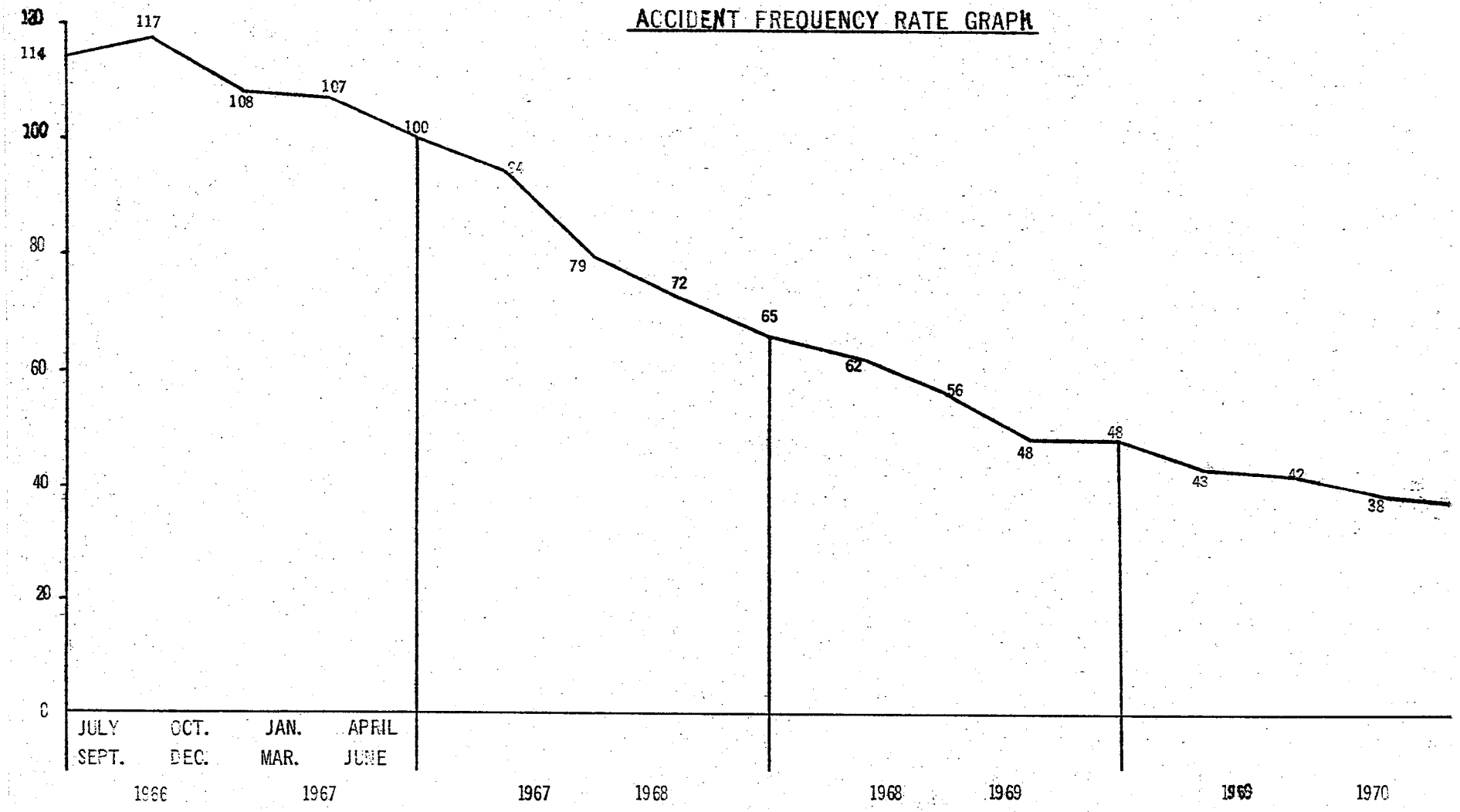
	DISABLING INJURY ACCIDENTS.	
	1969-1970	1968-1969
BUSSELTON	7	8
MUNDARING	3	4
DWELLINGUP	1	6
COLLIE	4	7
KIRUP	14	9
MANJIMUP	4	13
NARROGIN	1	NIL
KELMSCOTT	6	5
COLLIER-SOMERVILLE	3	5
WANNEROO	7	12
HARVEY	3	12
PEMBERTON	3	1
NANNUP	6	5
SHANNON	4	1
TRAINEES	NIL	NIL
W. PLANS	1	3
RESEARCH	3	3
HEAD OFFICE	NIL	1
KALGOORLIE	NIL	1
	70	96

TOTAL MAN HOURS WORKED -
1,901,020

F.R. = 36.8

WESTERN AUSTRALIAN FORESTS DEPARTMENT

ACCIDENT FREQUENCY RATE GRAPH



STAY ON THE SAFE SIDE.

It's not the hard hat, the specs and the gloves
That bring you home safe to the family you love.
The guard on the grinder, the chain on the hose,
The safety load binder, the foul weather clothes,
The latch on the load hook, the outrigger block,
The emergency brakes, and the standard wheel chock;
The Safety valve feature on the high pressure tanks,
The cave-in protection on the vertical banks,
The well-installed belt guard, the safety-toe shoes,
And the fire extinguisher, ready for use;
The seat belt that holds you inside your car,
The road signs of safety wherever you are -
These things are mere tools, like a carpenter's plane;
They won't produce safety or minimise pain.
Your health and your safety depends upon you-
On whether you think about things that you do.
So think before acting; make thinking a rule.
Make use of your brain - your best safety tool.

SNOWY CHIEF LAUDS USE OF SEAT BELTS.

The compulsory use of suitable types of seat belts in all road vehicles while in motion would result in well over one thousand less widows in Australia each year.

The Commissioner of the Snowy Mountains Hydro-Electric Authority, Sir William Hudson, said this at the South Australian Industrial Safety Convention in Adelaide recently.

Sir William said road accidents were not only the concern of industry but the whole community.

More than 3,000 deaths occur each year on Australian roads. This is an average of eight or more a day, while the number of serious injuries is many times that of deaths.

Sir William continued: "I claim without fear of contradiction from any one who has thoroughly studied the position, that the adoption of one simple measure would reduce by 60% to 70% or more, the death toll from accidents on our roads and would result also in much greater reductions in the number of people maimed and permanently disabled."

"In other works, the adoption and use of seat belts in all moving vehicles would avoid on the average four or five families being deprived of their breadwinners tomorrow, four or five families the next day and the next and so on."

Sir William said studies carried out in Sweden and Britain confirm the correctness of his estimates.

"Surely all organisations in the community which have the authority to institute regulations covering the use of motor vehicles, including government and public bodies as far as the general public is concerned, and executives of industrial organisations in the case of vehicles used by private companies, must see the great responsibility they are carrying the longer they delay in bringing in this measure" Sir William declared.

Without imposing severe penalties for failure to use seat belts the effectiveness of the life-saving measure would be greatly reduced. The counter argument was that by adopting penalties Australians were being deprived of freedom.

"In other words" said Sir William, "it would appear that opponents to the compulsory use of seat belts place more store in freedom - really

meaning by freedom, of course, lack of discipline - than they do in avoiding wives becoming widows and children becoming orphans."

COMPULSORY USE

"That fact that by avoiding the compulsory use of seat belts we condone preventable, fatal injuries is something I have never been able to understand."

Although he had quoted overseas research claims on the effectiveness of seat belts, Sir William said his personal experience on the Snowy Mountains project during the past seven years had confirmed these reports.

The Snowy Mountains Authority operated over 600 vehicles which travelled over five million miles each year, mainly over winding mountain roads.

Since 1958, when the wearing of seat belts was made compulsory, with penalties of dismissal for those ignoring the regulation, there had been a number of serious accidents involving head-on collisions, vehicles running into trees and other obstacles at high speed and vehicles rolling down hillsides.

"Since that date" said Sir William, "not one serious injury to driver or passenger has occured."

He commended the South Australian Government for taking the initiative in requiring seat belt anchorages to be installed in all new vehicles registered in the State.

"I also understand the Government is considering legislation which will require seat belts to be attached to these anchorages. I suggest strongly to leaders of all public and industrial organisations in South Australia that they follow the Government's lead by insisting on drivers and passengers wearing seat belts whenever the vehicle is in motion."

"What an example this State would provide to the rest of Australia if all your firms and Public bodies adopted this safety measure. There is no easier way of saving lives" Sir William concluded.

FIRE DANGERS OF BLASTING AGENTS.

The use of ammonium nitrate blasting agent has expanded considerably in recent years. There are fire dangers relating to the storage of ammonium nitrate and care is necessary in storing this substance.

Ammonium nitrate was used for many years as an ingredient of various explosives, mainly for military purposes, but also as mining explosives. The nitrate was available only in a crystalline form, which made very insensitive explosive mixtures. The production of this chemical in a pelletised or "prilled" form has revolutionised explosive practice. The small pellets are covered with an inert substance which renders storage and transport safer and the pellets are so porous that they will absorb sufficient liquid fuel to make a balanced explosive mixture. Three pints of diesel fuel oil is sufficient to mix 50 lb. of the prilled ammonium nitrate.

Whilst there is no restriction on the purchase of ammonium nitrate a licence is required to manufacture it into a "blasting agent" by mixing it with fuel oil. The main restrictions on the manufacture of the blasting agent is that it can be mixed only on the property where it will be used and only the quantity required for immediate use is permitted to be mixed.

Ammonium nitrate is classified as an oxidising agent. The greatest hazard of ammonium nitrate is fire. In a fire the nitrate will melt and run and will subsequently decompose to produce oxygen. This can cause the most violent reactions with any combustible material and can result in explosion or blast because of the rapidity with which materials will oxidise.

It should never be stored close to other explosives, nor where it can come into contact with any inflammable materials, such as bags, blood and bone, or other organic fertilisers, feed stuffs or inflammable materials or any kind. Whilst some of these things will only smoulder under normal circumstances they can burn quite violently in the presence of ammonium nitrate.

The ammonium nitrate should always be stores on a cement or other incombustible floor or it can be kept in steel drums or a similar type of container.

DRIVER SAFETY.

S - SPEED must always be taken into account. Suit your speed to circumstances and plan your trip to suit your time. Wear Seat belts.

A - ALERTNESS at all times while driving will pay good dividends. Plan 'refreshment' stops on long trips.

F - FAILURE to repair defects such as faulty lights, windscreen wipers and brakes will lead to .....

E - ENSURE you drive in accordance with the road laws of the State in which you are travelling.

T - TREAD on tyres is important -- smooth tyres have no place in your holiday plans.

Y - YOU, and you alone, are responsible for your faimly's safety on the road. Drive defensively for your own sake and for the sake of other road users.

ROAD SAFETY HINT

The driver who boasts about the speed he travels may soon forever hold his peace.

"DON'T LET YOUR WHEELS GET AHEAD OF YOUR EYES"

Many accident reports state the reason for the accident was "speed too fast for conditions". To the average motorist this usually means wet or gravelly roads, mist, or other hazardous weather conditions. Too few drivers realise that speed can also be too fast for conditions on a clear sunny day. Approaching a blind corner without slowing, too high a speed on narrow or poorly surfaced roads, around Headquarters and built up areas - can result in accidents classified as "speed too fast for conditions."

Have you seen tyre marks on a road leading to a pile of broken glass? This was where the accident occurred. The skid marks tell us the driver had applied his brakes before the accident. He saw the danger but COULD NOT STOP. WHY? HIS WHEELS GOT AHEAD OF HIS EYES. He saw the danger TOO LATE to successfully respond.

REMEMBER that an accident is almost always an unexpected event. If you are "expecting" an accident you will drive to avoid one. This is what a course of "defensive driving" teaches.

DELEGATION : AN IMPORTANT EXECUTIVE TOOL

The dictionary, a frequently helpfull book, tells us that the verb delegate means "To entrust to the care or management of another".

This action, seemingly so casual and simple, is a vital procedure for the executive. It can mean the difference between an executive who is harassed, overwhelmed by his personal work-load, and the one who, because of his skill at delegation, proceeds confidently and effectively to cope with whatever tasks come his way.

No matter how good an executive or manager you are, your responsibilities will always be greater than your personal capacities to carry them out. That's not a criticism. It's an accepted fact. Occasionally you'll find a man who refuses to accept this simple fact of executive life. He won't delegate. He'll strive with all his might to push the inner ring outward in an attempt to make the two circles coincide. And he'll complain:

....."I have to be in three places at once".
....."I don't dare take a day off".
....."I've got ulcers".

You'll also find executives who head for trouble in the opposite direction. They over-delegate. You've heard their cry:

....."Why doesn't somebody tell me what's going on?"

The trick of delegation is to concentrate the most important matters within the circle of things you handle yourself. The less important details can be left to others while you give the weightier problems the attention they deserve.

Delegation is a sanity saver for several reasons. It gives you freedom of action, allows you to turn your attention to the areas of your job that need it most. It gives you more time to spend on important long-range planning.

But greater efficiency isn't the only motive for delegating a part of your job. Enlargement of a subordinate's job can produce three other important results for him - and for you.

.....Develop his sense of responsibility.
You may want to make an assignment purely in the interest of increasing his ability, and value to your activity as a whole.

.....Enlarge his general understanding.
For instance, the best way to stress the importance of customer relations for one of your assistants might be to ask him to take over customers' complaints.

.....Increase his job satisfaction.
Some subordinates thrive on varied assignments. Their interest in the job increases along with its responsibility. Delegation of small projects helps maintain their effectiveness as team members.

Used in these ways, delegation is another means of getting employee co-operation.

Properly handled delegation guarantees that your over-all job will be to remain in control and that the people working under you will keep moving in the right direction. But there are hazards.

You'd be wrong for example, to assume that delegation is a one-shot affair. You can't delegate and forget. Chief reason is that your responsibilities change. New problems come up, make fresh demands on your time. You must be ready to review past delegations. You may have to make corresponding changes in tasks you've assigned to others.

There are specific occasions in the course of your work when delegation is called for. Here, for example are three instances:

.....When you're overburdened.

It's a safe general rule that you simply can't handle all your responsibilities and still do a good job on the important ones.

.....In emergencies.

Your first thought may be to let everything else drop. Yet the temporary suspension of even a routine matter may leave you with too big a backlog when the crisis is over.

.....In your absence.

It might be a two-week vacation - or a series of conferences. But someone will have to provide minimum authority while you're gone.

As a starter, check up on the time you spend now in:

(a) filling out routine reports, requisitions, etc;
(b) making calculations and entries:
(c) checking materials and supplies;
(d) running your own errands;
(e) engaging repeatedly in certain simple mechanical tasks.

If you can reduce any of these tasks to a matter of final O.K., a signature, or dispatch of a messenger, consider handing them over to some subordinate.

There's another side to the delegation coin. Just as there are situations for which delegation is a solution, there are circumstances that make it inadvisable.

Delegation can cause trouble if you hand over the wrong duties. Some of your responsibilities are yours for keeps:

.....Power to discipline.
It's the backbone of executive authority.

.....Responsibility for maintaining morale.
You may call upon others to help you carry out assignments that will improve morale. You cannot ask anybody else to maintain it.

.....Over-all control.
No matter how extensive the delegations, responsibility for final performace rests on your shoulders.

.....The "hot potato".
Don't ever make the mistake of passing a critical and demanding assignment along just to take yourself off the spot.

You must retain some jobs. It's best to hang on to them if:

They are too technical. Computing a floor load or projecting a cost estimate may be routine for you - but may be completely beyond a subordinate's skill.

The duty involves a trust or confidence. For instance, handling confidential cost date, dealing with the personal affairs of one of your people.

To keep things moving at full blast, you may find it necessary at times to delegate duties involving initiative, judgment, and decision. But consider these factors:

(a) the duty to be delegated;
(b) the ability of the person it will go to;
(c) your ability to keep control - that is, to keep posted on progress.

To get the most from delegation, tell your delegate...

.....The Facts.

Give him a clear picture of what he's to do, how to do it, and how much authority he has with which to get it done. "You never told me" is the sorry epitaph on many a well-meant delegation.

.....The relative importance of the job.

You know how important a job is because you see it in the setting of your whole responsibility. Your delegate can't make the necessary adjustments when he runs into trouble unless you have given him the complete background.

.....Whom he must deal with. If the assignment will bring him into contact with new people - for instance - men in other departments - introduce him in these places yourself. And be sure you let everybody involved know that they're to deal with your subordinate.

.....Why you picked him.

In other words, prepare him psychologically. He may feel an excessive weight of responsibility. Lessen the tension by removing his sense of crisis. Show your confidence in his ability - that's why you picked him. Reassure him from time to time. And emphasise your availability whenever he's in doubt.

Get others to co-operate. - Often the responsibility you assign does require a certain amount of authority over others. It may be minor, but even a clerk - trying to collect figures for a report you want to make - is likely to find people with their backs up, slow to co-operate.

To avoid conflict, follow these simple rules;

. . . . . Define scope.

Specify the exact nature of the duties and authority you are delegating. That's essential to keep your delegate on the right track. He may think you're handling over your job unless you tell him what's what.

. . . . . Tell the others.

Define clearly and publicly the limits of the authority you delegate. And take care of complaints about overstepped boundaries promptly.

. . . . . Set harmony as a goal.

Reserve the right to discipline. Don't let your delegate try to enforce co-operation. Impress him with the importance of working harmoniously with other members of your team. Sell your people on the need for delegating the job.

. . . . . Keep control.

When you delegate, you don't really get rid of responsibility. You must still keep control. You'll need it in order to get co-operation - to make sure the assigned task ties in with other objectives you have in view.

Your instructions must include a standard operating procedure - actual rules by which the subordinate can handle the situations that constantly recur. Examination of the results is the easiest kind of control you can exercise. You simply look at the completed performance.

It's a sort of "hands off, men working" policy, used when your assistant is highly capable or where the task is largely mechanical.

. . . . . Follow-up.

Often it isn't wise to wait until performance is complete. Errors may be too expensive, too hard to correct. You may want to check progress by inspecting, sampling, spot-checking. This is especially good where responsibility is new, large, or hard to handle.

. . . . . Progress reports.

For a variety of reasons - time element, location, etc., - you may prefer to have your subordinate report on how he is making out. Such a report may be frequent or infrequent, written or oral, in person or by telephone. You must decide what will be adequate under the circumstances involved in each case.

Occasionally you may find yourself too wound up in controls, too badly snarled in red tape. Ask yourself these questions:

. . . . . Have I delegated duties I can more efficiently handle myself?

When you have to follow up with constant observation, the game of delegation isn't worth the candle.

. . . . . Are my delegations boomeranging?

When you pass a sizeable task to a worker, you may have to give him an understudy. Otherwise, when he's absent, the delegated duty comes home to roost.

. . . . . Have I set up the right controls?

Ability to make controls work effectively - is the real test of executive leadership.

BE PREPARED FOR TROUBLE

Delegation is no bed of roses. So prepare yourself for trouble. It'll range from the trouble that makes you shrug to the trouble that makes you shudder.

Face it. The man to whom you delegate won't do the job the way you would. Even if you've given complete instructions, don't be surprised if many a delegated assignment ends up in unexpected fashion. If you're inclined to throw up your hands, don't. It's probably time for you to re-assess your delegation procedures.