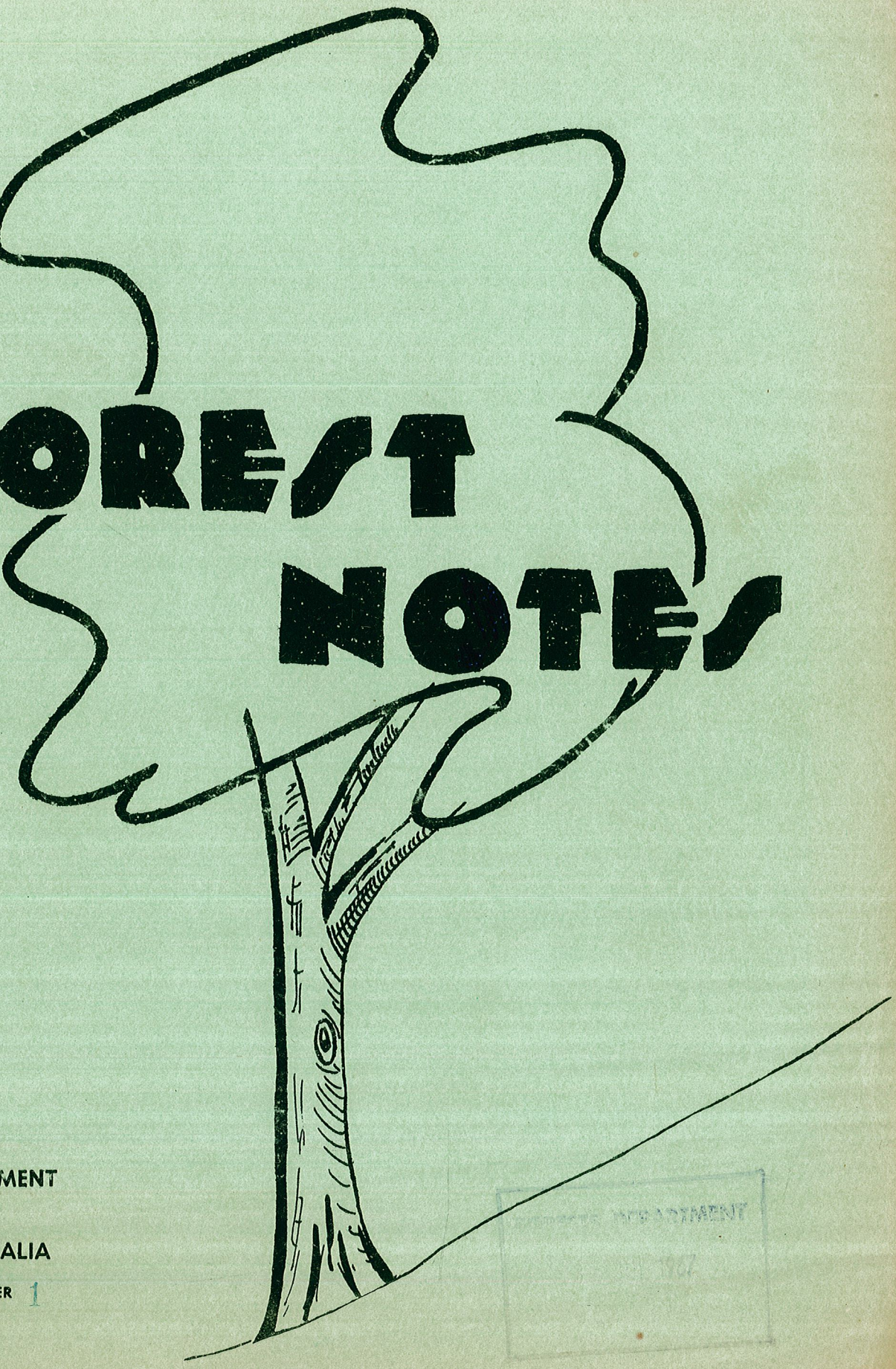
FOREST NOTES



FORESTS DEPARTMENT
PERTH
WESTERN AUSTRALIA

VOLUME 5 NUMBER 1

CONTENTS

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EDITORIAL

The editorship of Forest Notes has once again changed hands. The new Editor would like to take this opportunity to thank Mr. P.N. Hewett and Mr. J.A.W. Robley for their enthusiastic work over the last four years.

At the same time, an apology must be made for the failure to produce a March issue of this publication. Since only three contributions were on hand at the time of publication, it was decided to save them for this issue.

A note to potential contributors. Preparation for the production of the format for each issue would be greatly assisted if contributions are made on quarto paper and, if possible, typed.

With the publication of this issue, no further articles are on hand, and anyone interested in the survival of Forest Notes is requested to submit an article before the closing date of the next issue (August of this year).

R. J. UNDERWOOD

Editor

KARRI SEED HARVESTING FOR REFORESTATION

by O.W. Loneragan

Methods of harvesting karri nuts are being investigated to increase seed availability and reduce costs of collection when seed is available in greatest quantities. Collection is cheapest during the prime seed years. These occur at irregular intervals of between four and thirteen years. Previous to the present prime crop, 1956 was the last prime year.

Two hundred million seeds are the annual requirements of the Department for seeding karri forests following trade cutting. Foresters during treemarking retain adequate seed trees so that seed supply is no problem during an average seed year. Four years, however, is the length of the floral cycle to produce ripe seed from bud inception. Artificial sowing, therefore, is required to keep forest areas fully stocked in those years when the trees are in bud or blossom and carry too lean a supply or no seed for natural seeding or regeneration.

Two years in three is the average occurrence between seed years when artificial regeneration may be required. Two hundred million seeds per thousand acres of prepared seed bed are the annual requirements in these years simply by broadcasting the seed for reliable establishment at a plant percent of 0.5% or 1,000 seedlings per acre. Seeding per acre requirements in karri forest sites are 50,000 strongly viable seeds on a good site, 100,000 on an average site and 150,000 on a prepared poor quality site. The annual requirements are calculated for seeding rates on the poor sites to achieve overall success in the regeneration of karri. This is 100 times the number of seeds required by planting out seedlings from a nursery. Aerial seeding requirements with new techniques in grading and pelleting the seed will lie somewhere between these extremes.

One ton of two million karri capsules yields 10-15 pounds of pure seed, or a minimum of three million seeds or three seeds per two capsules. Therefore about fifty tons of capsules for full scale artificial operations between seed years during one decade will provide the calculated total requirements by improving the plant percent from 0.5% to 5.0%.

Hand methods of collection have been carried out so far in the summer, and one man collects about 10,000 capsules per hour. The fruiting branches are cut from freshly felled trees and the foliage is trimmed off them. They are dried out either in the bush or put into bags and taken to headquarters. Drying in the sun consists of making a loose heap of the branchlets and capsules on a tent fly for 2 or 3 days, then shaking the capsules and sieving out the seed together with the inert material called chaff.

For the large quantities of seed required, automatic methods of capsule harvesting, curing and extracting seed are necessary. Mr. Max Finch of Manjimup donated an old harvester for testing initially the possibilities of collecting the capsules. The suggestion was made by his son, Steve, when employed on seed collection during the school vacation. Modification and testing of this 60 year old harvester by Workshops showed that bagging of capsules is eighteen times the

work rate of the hand methods. The harvester also collected twice as clean a product, which comprised 73 percent of green capsules compared with 35 percent of the material bagged by hand. Improvements in product purity were sought and achieved by both methods. Stripping by hand provided 90 percent capsules but took a disproportionately longer time to collect than before. The latest improvement through the machine raised the proportion of capsules to 82 percent. Valuable guides from the test have been obtained of the requirements in a modern harvester for collecting karri capsules. Further developments also will be tested to make the best use of the available seed source. These include the provision of drying facilities and automatic extraction methods for collections in the winter time.

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NANNUP GOLF DAY

Elsewhere in this issue is an entry for the Golf Day to be held at Nannup on Sunday, 13th August. The Day is open to all Staff of the Forests Department, their wives and children.

Events will be :- 18 hole stroke for men

9 hole stroke for women

You are expected to provide yourselves with a picnic lunch; Nannup will provide afternoon tea and a barbecue after the game.

Remember, you don't have to be a player to attend!!

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BOTANICAL COLLECTIONS

A Source of Revenue and an Advertisement for the State's Wildflower Wealth

by A.L. Clifton

Western Australia is renowned for its wildflowers. However, beauty is not the only remarkable attribute of our flora; it is also of considerable academic interest. From the times of the earliest explorers, naturalists have been excited over the botanical wealth of this State. Today, visiting botanists from all over the world continue to eulogise the diversity and beauty of our flora.

Pretty posters attract tourists, but the real plants, as pressed specimens, will bring the intellectuals - university folk and museum curators. These people will advertise for us, having contact with thousands of students who in turn go out into the business world with ideas that will influence the course of tourists and travellers. A collection of attractive wildflowers properly preserved will last for centuries and will continue to advertise for this State for many years to come.

Why are our wildflowers of such importance in the academic world? To answer this question we would have to refer to the Botanical sub-branches of plant geography, plant genetics, plant ecology, evolution and so on. Climatology, soil geology and geomorphology would also have to be brought into the picture.

The surface of South-Western Australia is one of the oldest in the world. It has been stable for millions of years, with very few of the abrupt climatic changes which have altered the course of evolution in other parts of the world. The effect of this long period of climatic and geological stability upon native plants is of vital interest to members of these and other disciplines.

How can we reach all these people? There should be a collection of Western Australian flora in the botany departments of every University in the world.

Collections could be standardised and mass-produced by the Forests Department. A pre-selected range of plants in flower would be collected, positively identified, poisoned, mounted, and given brief descriptive notes. A reasonable, profitable figure could be charged for the collections. Two sizes of package-deal collections could be compiled. For instance, a small collection of say 100 representative specimens would comprise a basic unit. Another size representing more detail at say 500 specimens could be then made available later. The prices charged could be about $30 for the smaller collection and about $200 for the larger. Larger collections would have to be made on a contract basis. These are prices which are far below the cost of an individual institution making the collection. They would sell well.

This is not prostituting the Department's duty as warden of the Flora; it is providing a very important service to science and serving Western Australia into the bargain.

PINE PRUNING WITH LIGHT-WEIGHT CHAINSAWS

by A.B. Selkirk and R.J. Underwood.

The wide spacing and initial vigorous growth of a young P. radiata stand at Clifford's Plantation in the eastern portion of the Mundaring Division has presented a problem in having this stand economically low pruned. The plantation is in the 20 - 25" rainfall belt and is planted on an abandoned farm about 25 miles east of Mundaring Weir headquarters. Early losses due to summer droughting has resulted in the remaining trees assuming the poor form and branchiness of open-grown trees. Axe pruners were consequently faced with the formidable job of removing limbs up to 3" in diameter at their point of junction with the tree bole. To get a clean job, "scarfing" and "backing-down" were required on virtually every limb on every tree. The job proved very costly.

Following an idea by a local officer, advantage was taken of a demonstration given by a chainsaw company representative to test the suitability of a light-weight chainsaw to the low pruning of these heavily limbed trees.

In a trial run on the largest trees at Clifford's, seven trees were pruned to seven feet in just under ten minutes. Allowing for normal delays and operator fatigue, it appears reasonable to expect a tally of up to 200 trees per day from an experienced operator - a tally similar to that obtained from a gang of six men using axes in this particular stand.

The lightness of the saw (about 12 lbs.) and its great power would appear to make the application of the machine to low pruning open-grown trees a feasible, safe and economical project. However, a larger scale trial, together with a properly conducted cost analysis would be necessary before any firm recommendations could be made.

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A NOTE ON FORESTRY OVERSEAS

by D. Lejeune

Below is an extract taken from "The Progress of the Forests Department (Sudan) since Independence" :-

> "The following is a summary of the main achievements of the Forests Department and its progress after Sudanisation in 1956 and until the Ninth Anniversary of Independence. The rise in standard in quality and quantity of work is attributable mainly to decentralisation whereby the Forests Department seceded from the old combined Agriculture and Forests Department, and is also due to Sudanisation bringing young enthusiasts to work with devotion and determination in this difficult field, the work centres of which are in the hardest and remotest terrains of the Sudan's nine Provinces. The foresters whose working day starts at 6 a.m. and usually continues long after official working hours, do not ask for annual leaves except in sickness and the like. The Director of Forests, as an example, has not taken one day of his entitlement for leave since 1953 and so did several of his colleagues."

The P.S.C. would no doubt be interested to learn that this is not unusual for foresters.

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THE EFFECT OF MILD BURNING ON JARRAH GIRTH INCREMENT

by J. McCormick

An experiment was established near Dwellingup in 1963 to find the effect of burning on Jarrah G.B.H.O.B. increment. One part of the experiment showed no significant effect of mild Spring and Autumn burning on girth increment.

A total of 30 plots were established. Five trees were selected in each plot and fitted with dendrometer bands. Six plots were treated with a mild Spring burn (Nov. '64); six plots with a mild Autumn burn (Apr. '65), and a further six plots held as a control thus giving 30 trees in each of the three categories for comparison.

Dendrometer readings were taken at monthly intervals and the total growth of the 30 Spring and 30 Autumn trees was compared with that of the control trees for a 12 month period both before and after burning. The results were:-

Measurement Period	Mean G.B.H.O.B. Increment					
	Spring Trees	Control Trees	Diff.	Autumn Trees	Control Trees	Diff.
12 Months before burning :	.463"	.446"	.017"	.422"	.407"	.015"
12 Months after burning :	.507"	.423"	.084"	.453"	.432"	.021"
Difference between means were found to be not significant.						

The data was corrected to a standard 30 day period and a statistical test applied to 48 growth periods in an endeavour to locate any significant alteration in G.B.H.O.B. growth due to the burning treatment during the 12 months following Spring and Autumn burning. This test was also applied for the 12 months prior to burning.

Results. (i) Spring Mild Burn 12 months after burn.

Of the 12 periods examined (Fig. 1) only three periods (20, 21 and 26) showed any significant growth difference between treatment and control trees. These differences amount to a significant increase in increment on the control trees as compared with the treated trees at the beginning of the main growth cycle and a significant increase in increment on the treated trees over the controls at the end of the main growth cycle.

It was observed that the same thing occurred during the 12 month period before burning (Fig. 2 periods 8 and 15). A possible explanation is that these differences are a growth characteristic of the two groups of trees involved and are not, therefore, a result of the burning treatment.

(ii) Autumn Mild Burn 12 months after burn.

Of the 12 periods examined (Fig. 3), none showed any significant difference and only one significant period before burning (Fig. 4 period 15).

The original G.B.H.O.B. and bark thickness measurements of the 90 trees considered were taken on the 26th February, 1963 and the most recent measurements on the 13th June, 1966. The measurements are compared thus:-

	26/2/'63	13/6/'66	Increment for period
Mean G.B.H.O.B. of 30 Spring trees	2'7¼"	2'9¼"	2"
" " " " Autumn trees	2'9¾"	2'11½"	1¾"
" " " " Control trees	2'7¾"	2'9½"	1¾"
Mean 4 x B.T. of 30 Spring trees	.685	.737	.052
" " " " Autumn trees	.718	.775	.057
" " " " Control trees	.667	.740	.073

From these figures, little of significance arises which could affect the analysis save a slight increase in G.B.H.O.B. on the Spring trees over the Autumn and Control trees.

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Fig. 1. Spring After Burn

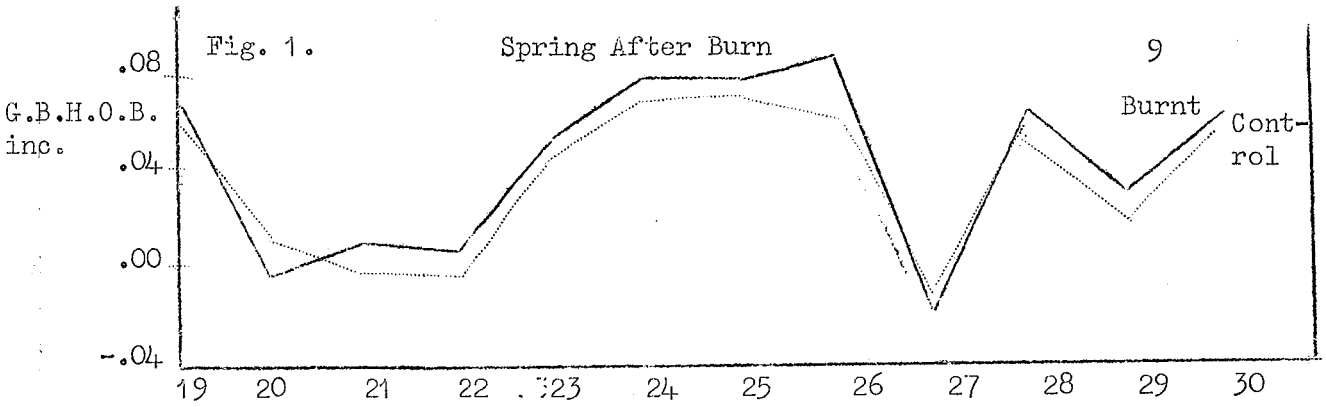


Fig. 2 Spring Before Burn

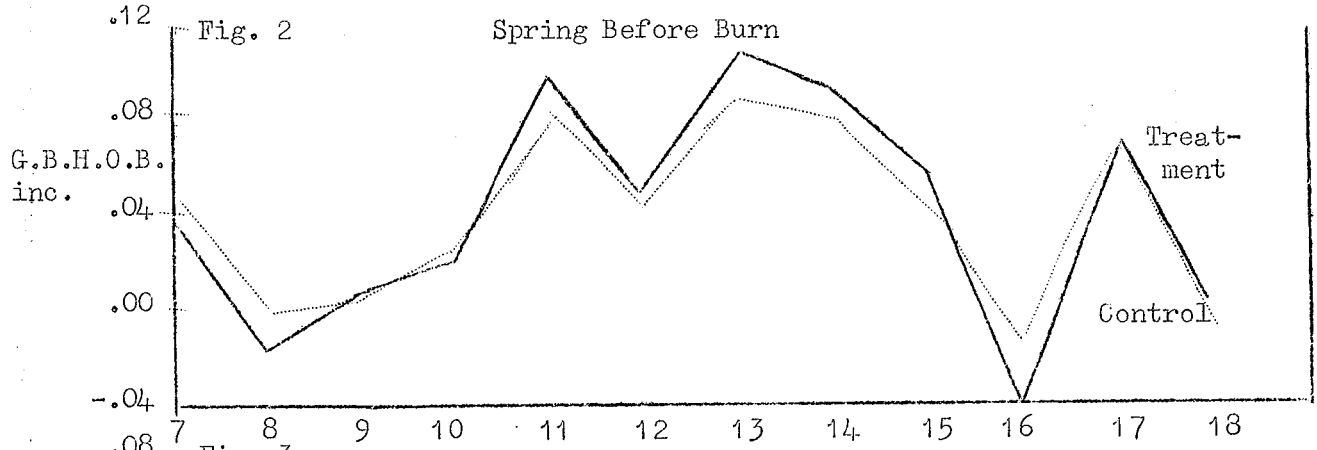


Fig. 3 Autumn After Burn

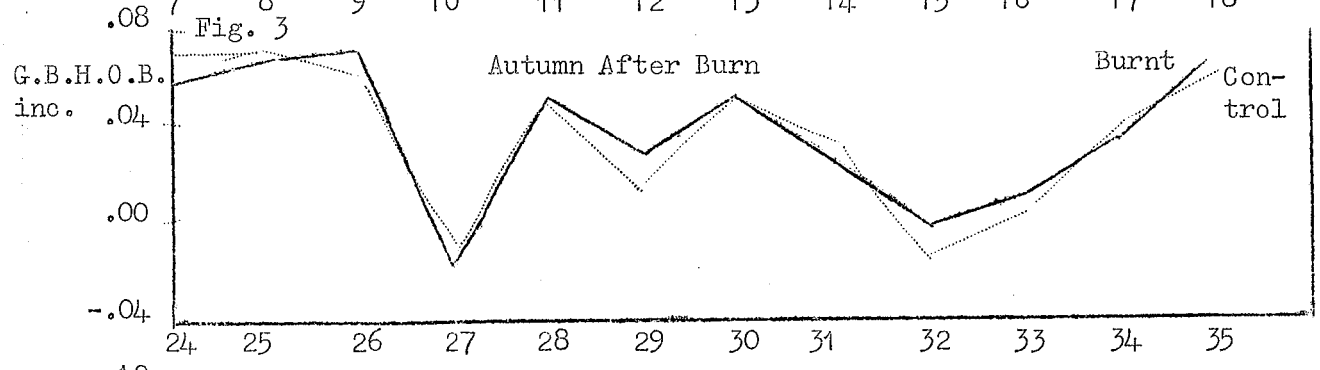
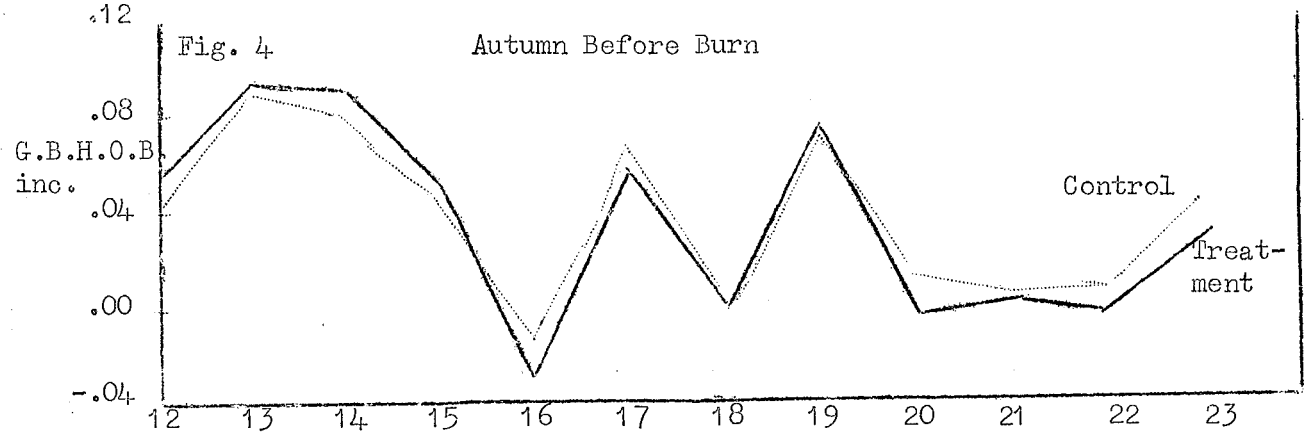


Fig. 4 Autumn Before Burn



ROOM FOR PINE.

by M. Kokir.

There are many forested areas in the Manjimup Division which present the forester with a problem in prescribing a suitable method of treatment. An area described below is considered typical.

The A.P.I. Map Sheet describes the particular area as a KMA V SFD Stand. In order to obtain a more detailed knowledge of the area, five independently located one-acre assessment plots were established within the stand. The results of the assessment are very interesting - they are presented in the Table on the following page.

It can be seen from the table that Karri is the predominant species in the stand, averaging 37.5 loads/acre. However, of this 37.5 loads, only 11.1 loads can be considered useful growing stock, 25.1 loads are merchantable and require immediate cutting and 1.2 loads have no potential merchantability. The useless volume is mainly in cull trees.

Volume per acre of Marri is 14.2 loads of which 11.7 loads is not merchantable.

An important and undesirable fact is obvious in the Table. In the 12"-60" GBH class, Marri contributes an average of 33 stems per acre while Karri contributes only 7 stems per acre. Although there are about equal numbers of Karri and Marri in the >60" GBH class (which is also undesirable), the figures for the 12"-60" girth class are most alarming - particularly since about 80% of the Marri has no marketable potential.

Since the area is still virgin, a trade cut is inevitable, both to pay for the upkeep of the area and to convert the site into productive forest. However, a heavy trade cut involving removal of static volume plus severely fire-damaged trees must immediately expose the area to Marri dominance. What then of the chief aim of silviculture - the obtaining of regeneration of a desirable species? With so much Marri in the smaller size classes it seems unlikely that satisfactory Karri regeneration would develop.

A possible solution to the problem is the poisoning of Marri to liberate Karri. However, this would necessitate heavy expenditure on an area which is not a first class Karri site.

A better solution in my opinion would be to plant such areas with pines. The per-acre value of pine well exceeds that for the native hardwoods either Karri or Jarrah. The royalty derived from clear-felling the Karri should cover the costs of clearing, cultivation and preparation of the area for pine planting.

The advent of a pulp and paper industry in the lower South-west would be a great asset to our economy. The planting of pines would encourage such an industry to move into this area, as well as increasing the productivity of the forest.

ACRE.	TOTAL VOLUME. Lds. Per Ac.			NUMBER OF STEMS > 60" K & M		CLASS OF KARRI (Volume in Loads)			MARRI VOLUME IN LOADS		NUMBER OF STEMS 12" - 60"		
	K	M	J	K	M	Growing Stock	Available for Cutting	Unmarket-able.	Satis-factory	Unsatis-factory.	K	M	J
ONE	50.3	14.6	-	12	11	22.0	27.8	0.5	2.1	12.5	13	35	-
TWO	40.8	20.2	7.9	5	6	1.1	39.7	-	1.4	18.8	8	32	-
THREE	27.2	15.3	-	7	7	7.7	14.6	5.9	8.5	6.8	9	44	1
FOUR	42.4	16.1	1.9	8	7	13.3	29.1	-	-	16.1	5	39	1
FIVE	26.7	4.6	-	6	7	11.4	15.3	-	0.4	4.2	2	14	-
TOTAL FOR FIVE ACRES	187.4	70.8	9.8	38	38	55.5	126.5	6.4	12.4	58.4	37	164	2
AVERAGE PER ACRE.	37.5	14.2	2.0	7.6	7.6	11.1	25.1	1.2	2.5	11.7	7.4	32.8	0.4

WHY PUT FERTILISER ON FORESTS?

by A.L. Clifton.

In Western Australia where soils available for forestry have generally been poor, it was found necessary to use fertilisers in the establishment of plantations. However, world thought in this field is turning more and more toward the need for fertiliser applications in the maintenance of plantations.

The application of fertilisers in the establishment of plantations in Western Australian forestry has been the practice for a long time. It is rare in other parts of the world, even unheard of in some circles. Locally, the application of "fortified" superphosphate on P. Pinaster at planting time, and the use of zinc foliar sprays on P. Radiata are well known. More recently, super has been used in the maintenance of our coastal P. Pinaster plantations.

Significant responses to other fertilisers have not been reported until recently, but the search for "balanced fertilisers" which will give trees a range of required nutrients at optimum levels has been carried on by small groups of patient workers. West Australians have long been regarded as authorities in this field.

The search was dramatised recently by the results of work by C.S.I.R.O. and Forests Department officers in W.A. pine forests. The work was done on a pilot trial established in 1964 at Gleneagle in failed P. Radiata and poor P. Pinaster. Nitrogen and phosphorus fertilisers were tested. Used separately, applications of these nutrients did not produce significant responses, but used in combination, the results were spectacular. Both species responded significantly to the applications. The work on these pines showed that the whole plant system was vitalised by the treatment - needle length increased, crown colour improved, photosynthetic activity increased, height growth stepped up; as a result wood production increased.

Cross-sections of trees taken from the plots were placed on display in the newly opened C.S.I.R.O. building in Perth. The sections clearly demonstrate the stimulating effect of a combination ofnitrogen and phosphorus fertilisers on these pinos .

Let us look briefly at the background to the search for balanced fertilisers.

It is true that a large proportion of nutrients taken from the soil by plants are returned to the soil from the breakdown of leaves and slash, but it is not generally realised that important amounts of essential nutrients are removed in logwood and bark.

In a recent article by T.E. Maki in Unasylva V. 20 (3), it was pointed out that nutrient loss through this drain must be replaced by fertilisation, or productivity of the site will decline. A table given by the writer is very

enlightening, even though it does not include P. Pinaster. A modification of the table is given below:-

Trees	Nutrient Drain in Pounds per Acre by Various Trees through bark and wood removal.					
	Age	Ca	K	P	N	Source
Pines	100 yrs	250	95	19	?	Rennie (1957)
Hardwoods	100	266	279	56	?	Rennie (1957)
P. silvestris	55	135	58	9	101	Ovington (1957)
P. radiata	35	170	230	30	200	Will (1964)

Nutrient status of the soil is one factor of the environment over which the forester can gain effective control to increase productivity. Here is a challenging field. Increasing the productivity of existing plantations, extending the area of plantable land into areas hitherto considered non-productive and the possibility of rehabilitating disease-ravaged forest land, offer tremendously rewarding fields of study. Such work offers the prospect of great economic gains and of heightening the status of the forestry profession.

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TOES

I think that I shall never know
A poem as lovely as a toe.
A toe that is so firmly pressed
Within my shoe, where five congest.
A toe that takes me on my way
With speed and sureness, through the day.
A toe that grants me freedoms stride
And keeps me walking tall, with pride.
Upon whose tender nail could drop
Loose objects that might crunch or lop;
No fool am I - I'll always choose
To kepp my toes in safety shoes.
"Anon"

(Extract from a commercial safety pamphlet, contributed by J. McCoy).

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THE COURT HOUSE.

by P.N. Hewett.

Despite the efforts of various pressure groups, Historical Societies, and the National Trust, the 1960's have been marked in Western Australia by many types of historic vandalism ranging from the opening of "time capsules" that are all of 25 years old, to the removal of old buildings to make way for modern earth and concrete works of doubtful importance. However, there is an awakening in progress and the small Court House in a corner of the Supreme Court Gardens appears to be safe for the future.

The Beginnings

The Swan River Colony had a small Court in the very early days but this was not a substantial structure and the Civil Engineer drew up a specification , dated 3rd February 1836, for the construction of a new Court. The original specification has been preserved and, like its modern counterpart , varies from careful detail to broad simplicity e.g.

"All sand used for the mortar shall be got from a sufficient depth to be coarse and free from vegetable matter and dirt."

"The three architraves of the porch shall be double being formed of two seven by thirteen pieces bolted together with half inch screw bolts mitred at the angles and having the inner ends cogged into a wall plate and loaded with the superincumbent wall".

"The roof shall be well and tightly shingled overall."

The contract was let for the sum of $1396 plus $77.50 for the gallery, and the first court sitting occurred on January 2nd, 1837. The building was designed for use as a Court and as a Church, and besides being (probably) the oldest building in Perth, it is the only example in Perth of Georgian architecture.

The History.

The Court House was used for many things since the shortage of halls, etc was apparently as great in the 1840's as it is in the 1960's and in many respects it was almost a Civic Centre.

From the 20th of September 1847 until 1850, it was used as the first home of Perth Boys School, and since it was still in use for legal purposes at that time, the school continued in the gallery whilst the Court convened in the main portion.

The Immigration Department used the Court House from 1856 to 1863 and then it reverted to Court use again until 1879. From 1879 to about 1900 the building housed the Government Gardener, and then in 1901 the first Arbritation Court was held in it.

The building remained the centre of Industrial Arbritation - until the creation of the Arbritation Commission in 1964, and it is now occupied by the

Legal Aid Society.

The Press.

The Colonial press in this State was never backward when offered the opportunity to criticize the Government, and most West Australians will have heard of the bitter attacks on the Goldfields Water Scheme. Similarly, the old Court House came under fire at regular intervals with comments about the high temperatures and their effects on Legal minds, and some sharp witticisms about the judge (circa 1870) who had to be protected from the leaky roof by an umbrella held by a clerk.

Apparently the ventilation was not very effective as will be seen in this extract from the "Inquirer" on Wednesday, March 25th, 1874. The Court House was said to be

> "---- an edifice constructed without any reference to foul air, as a visit to it when court is in its criminal jurisdiction, will speedily convince the most skeptical."

The Renovation.

The Court House is still owned by the W.A. Government, and the Architectural Division of the P.W.D. has recently commenced to restore the building to its original condition. A major part of this work involves re-shingling the roof.

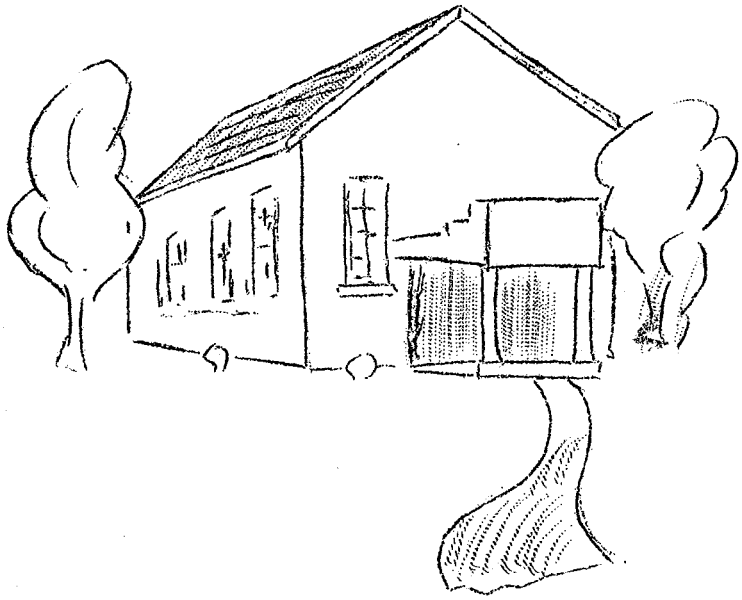
The original shingles and battens were She-oak, each shingle being approximately 10" x 4" and tapering in thickness from 3/8" to 3/16". The writer has one of these original pieces which is remarkably well preserved and which is still attached to a piece of batten by a single, hand made nail.

The new roof is very similar to the original and She-oak is again used as shingles. It is understood that Bunning Bros. supplied the material from Kojonup and from Albany. The shingles are sixteen inches long, tapering in thickness from $\frac{5}{8}$ inches to 5/16 inches and in random widths from $3\frac{1}{2}$ to $5\frac{1}{2}$ inches. Each piece is nailed to battens with a single galvenized nail placed about half an inch below "top dead centre". The shingles are two thirds overlapped which means that every nail is covered by two other boards and every exposed surface is underlain by two thicknesses.

There is unlikely to be a rush from new home builders for shingle roofs, but there is no doubt that a very pleasing effect can be achieved by roofing of this kind.

Acknowledgement. The writer is indebted to Miss McClements of the Legal Aid Society and Mr. Norman Smith of the P.W.D. for the valuable assistance in

providing much of the background material for this note.



A TRANSPLANTED EUCALYPT LIGNOTUBER
by L.D. O'Grady.

An unexpected result with a Eucalypt seedling transplant may interest other foresters.

A seedling established in my garden, (it looks like a Eucalyptus citriodora) was accidently cut off while hoeing. All that was left was the stem approximately 12" high with an attached lignotuber approximately 1" in diameter but no roots.

This was planted about 9" deep with stem protruding 3", the ground kept moist, and in 12 months I have a tree 5 feet high. It appears certain that the lignotuber produced new roots to enable the plant to survive. Incidentally another lignotuber approximately $1\frac{1}{2}$" in diameter has formed at ground level.

The point arises in my mind, which no doubt some forester can answer, is whether a lignotuber is a complete plant, i.e. we know it has buds which develop into stems and now apparently buds which can also produce roots. Therefore has the lignotuber the growth properties of a potato ?

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FIRE BREAKS IN PINE PLANTATIONS.

by J. McCormick.

Whilst firebreaks serve purely as a protective measure against possible fire outbreak, their cost and maintenance is high and in spite of necessity, they can be regarded as so much dead land. It would seem therefore that productive firebreaks would be more desirable, provided of course they serve their major role satisfactorily.

Those experinced in high rainfall forests will know the benefits accrued from the planting of oak and larch firebreaks. Firstly, both of those trees are deciduous and their leaf litter decomposes rapidly. In the green state they are fire resistant; also they are maintained by sustained yield cutting thus providing a valuable source of timber.

In selecting a firebreak tree suitable for local plantations the following attributes must be sought:-

(a) satisfactory growth;

(b) leaf litter with low combustion rate;

(c) leaf litter with rapid decomposition rate;

(d) utility value of timber.

The tree primarily fitting into this category is of course poplar since it appears to grow fairly well throughout the forest region and satisfies the above requirements admirably.

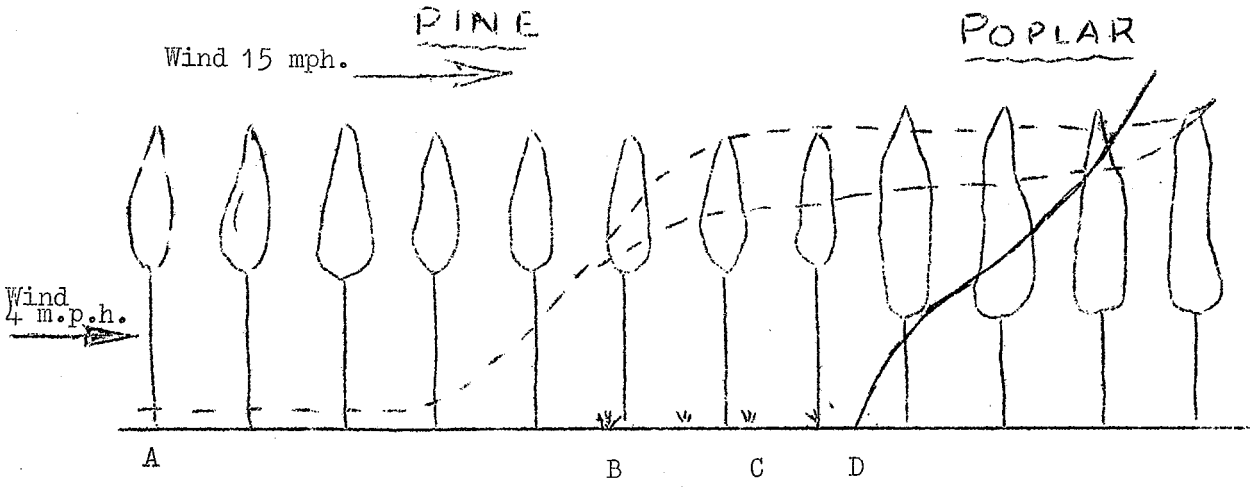
In litter burning trials carried out at Dwellingup the fire rate of spread for poplar litter was one third of that recorded for Jarrah and this rate could be maintained only by relighting the poplar fuel at three minute intervals. It is important to note that difficulty was experienced in trying to ignite the poplar fuel with the aid of fusee matches even after it had been exposed to direct sunlight in late December.

By way of a deus ex machina I would relate that my own experience of trying to dispose of heaps of poplar leaves in the garden led to the belief that the fires, if so those smouldering hoaps could be named, consumed more matches than leaves and I discovered that by the following Spring the heaps had decomposed completely save for a few leaf midribs.

In the event of a poplar break being established one must consider the possibility of undergrowth. In poplar plantations I have known, the undergrowth is sparse and consists largely of grass-type plants easily burned off without damage to the trees themselves. An alternative would be to undersow

with perennial clover thus having the double benefit of choking weed growth and raising the air moisture content near ground level.

If we consider the nature of a crown fire in pine and the way in which a planted firebreak works, we find (re illustration):-



– – – – – Line of headfire

w w w w Spot fires caused by crown fire.

———— Heat curve - ground fire stopped at point D.

A ground fire commencing at A (wind speed 4 m.p.h.) crowns out at B; thence crown fire takes over with 15 m.p.h. wind speed. At C the crown fire with increased wind behind it proceeds ahead of the ground fire spotting through on to the ground fuel; these spots link up providing the bottom heat which maintains the crown fire, for without this important factor the crown fire could not continue. Now, if we consider what happens when the fire hits the break at D, the first and most obvious thing is the fact that the bottom heat is removed. Secondly, owing to the fire resistant property of the break trees the crown fire is held in check. A combination of both factors will stop a severe fire but much depends on the width of the fire break. I would suggest that a fire break of this nature should measure 50 yards across with trees planted diagonally (staggered in rows) at 10 to 15 feet intervals. A wild fire will of course always spot ahead over a fire break but this sort of thing is much easier dealt with when the sting has been taken out of the headfire. Flank and backfires take little watching where a planted fire break exists.

The uses to which poplar can be put are varied e.g. matches, packing cases, veneers and soft fruit punnets. Poplar lends itself to coppice thinning

which would eliminate the need for replanting. A useful sideline is the sale of coppice shoots about 10' high, bundled up, rooted or otherwise for use in planting weather breaks on farms, recreation grounds, or along roadsides.

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TREE LOOK-OUTS.

by D.W.R. Stewart.

The appearance at Head Office of a small segment from a Marri tree with a section of 2" diameter Karri peg through it, revived memories of our first tree look-out in the main Jarrah forest area. It was felt that some notes on the development of tree look-outs might be of general interest.

Prior to 1936 there were no look-out towers south of the Collie division and no effective means of fire detection from Kirup southwards. A proposal in 1934 to erect a look-out in a pile-sized tree at Yornup was vetoed by higher authority on the grounds that no-one would ever climb it after it was erected. In 1936 a Tuart tree at Ludlow was converted to a tree look-out by Mr. Jack Watson (who was later Superintendent at Kings Park). In the following summer, 1936-37, a Marri tree was pegged some six miles west of Alco Siding on a moderately high ironstone ridge. The view exceeded all expectations, a crow's nest was built in the limbs and the following year a 6ft by 4 ft cabin was constructed, with floor level some 85 ft. above ground. This served for some 26 years before it was replaced by a 110 ft. tower, and it was from this "Alco Tree" that the sample was sent to Head Office, showing the Karri peg in perfect condition, after 26 years service in an exposed position. About the same time a small crow's nest was built in a jarrah tree just south of Kirup headquarters.

Observations from the established "Alco Tree", together with many observations taken by Jack Watson from trees climbed to various heights on many hill tops, enabled the selection of many other look-out sites. In the high forest south of the Blackwood River, constructed towers to give clear vision over canopy from 150' to 190' high, would have been very costly, but a series of tree look-outs were established at very low cost as under:-

Big Tree	1938	146 ft.
Pemberton H.Q. Tree	1939	120 ft.
1st Gardner Tree	1940	160 ft.
Diamond Tree	1941	180 ft.
2nd Gardner Tree (for permanent use - replacing the first tree)	1942	190 ft.

Gloucester Tree (This replaced the small tree at Pemberton H.Q. but its construction had been deferred for 6 years awaiting trade cutting of the surrounding forest)	1946	200 ft.
Beard Tree	1952	160 ft.
Boorara Tree	"	180 ft.
Greenbushes Tree	"	85 ft.

Although the use of sevaral of these trees has been discontinued or is intermittent, five of them are still major look-outs in the southern regions of our forest area, and will apparently give service for many years yet.

Incidentally, the Karri peg referred to in the opening paragraph is in very sound condition after 26 years exposure to the elements.

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Forest Office,
NANNUP...W.A.

NANNUP GOLF DAY

I will Play/Attend the Golf Day to be held on

SUNDAY 13th August, 1967 and will be accompanied by

( ) wife ( ) H'cap

( ) children

My handicap is ( )

Signed .....