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FOREST NOTES

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PERTH
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CONTENTS

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EDITOR'S NOTE.

Manuscripts are still being forwarded at a pleasing rate, and our thanks go out to authors and to Editorial Whips. There is a small carryover of articles for the December issue, so please don't be discouraged if your article does not appear this time.

You will notice the addition of a "date of issue" on the front cover and this page; the constructive criticism which brought this about has led to the consideration of a "Letters to the Editor" section. Our next issue will include letters to the Editors so long as they are not abusive, have less than 200 words, and include the author's name. We trust that the anonymous "Blossom" will consider re-submitting his short items with name attached.

Raw Research has died a natural death. We pray that this tragedy is limited to the pages of Forest Notes, and is not widespread throughout 13 Divisions. This section will be revived when contributions to it are received.

The December issue (Vol.2, no.4) should include a section from at least one of our foreign correspondents, and will become a feature for two or three issues under the title "Perry in Portugal". To make sure you don't miss it, send in an article yourself to help guarantee that Vol.2, no.4 will be produced.

P. N. Hewett C. J. Edwards

JOINT EDITORS

OBITUARY

W. H. "TAFFY" EDWARDS.

The death occurred at Collie on 14.7.64 of W.H. "Taffy" Edwards at the age of 63, only a few months after his return from a long service leave trip to his home county of CAEN'S NORTH WALES.

Taffy first came to W.A. in the early twenties and worked for a time on various farms in the Southwest.

Following the general depression of the late twenties he joined the Forests Dept. at Willowdale in 1935 and was employed for some fifteen years at Harvey. Part of that time was at Harvey Weir.

Taffy first came to the Collie Division during the 1940s. His great love of horses soon led to his being appointed to the horse drawn grader and plough. Despite the fact that he spent the greater part of his life during the next ten years camping alone in the bush, he quickly became a well known and popular figure in Collie which he visited at regular intervals for stores.

For several years before his retirement, early this year, Taffy had been assisting with nursery and plantation work at Palmer Plantation where his experience and reliability were of great value.

He is best described by someone who knew him well "A thoroughly dependable, generous man with a natural straightforward honesty".

Well known throughout the Department he will be missed, especially at Collie. His kind are increasingly difficult to replace.

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THE FLAMETHROWER.

N. Percival.

The idea of the flamethrower was first thought of in the late 1930's, following the use of a Hauk torch, which was first used in nurseries to burn off weed.

The torch was then tried at controlled burns to put a face on a burn, but was found to be slow and costly.

Another means of lighting, which was used in the Karri areas, was the blow lamp, which was quite successful for burning mill tops, but faded out after several burning accidents due to the neglect by the operator of the blow lamp.

Another step towards the flamethrower, was to squirt kerosene onto the fuel and light, this gave us results, but again was too slow and costly.

However, we now knew what was required, heat and fuel at the same time.

Several things were tried with the Hauk torch and finally with a pack spray, using several kinds of burners, until finally the cone shaped funnel was found satisfactory, using asbestos string to keep the flame going at the mouth of the cone.

These have been used successfully for many years and with a flame thrower working properly, fires can be lit from utilities and jeeps at speeds up to 30 m.p.h.

In recent years improved types of flamethrowers and P.T.O. pumps used on tractors are highly successful.

The tractor with P.T.O. flamethrower is one of the most versatile machines we have, these can be used in difficult terrain either boggy or steep, or along prepared walking lines.

The flamethrower has come into its own and if used in the proper manner, under the right conditions, it will greatly increase the area of burning at a much reduced cost per acre.

A. The advantages:

1. Puts an edge on all proposed burns - minimizes mopping up and patrolling.

2. If done at the right time and with the right wind, can burn large areas scorch free.

3. Two or three units can do the work of 50 men.

4. Cuts costs - more burnt - less patrolling.

B. Disadvantages:

1. Under too hot conditions - get bad scorching and get a lot of country alight with increasing temperatures.

2. Under too cold conditions - poor edge burns waste of time and spoils edge for another time.

3. Increases cost if not done properly.

C. Ways of doing it.

If we are going to carry out our programme of controlled burning say approx. 750,000 acres per annum, we have not sufficient manpower to carry it out without the aid of the flamethrower.

Early in the season every outfit should be used to full advantage, to cover as much ground as possible, before the weather gets too hot.

Where edges are not good enough - (because of being too thin or too dense) - These should be widened out by the use of drip torches under warmer conditions.

Care must be taken when using flame throwers on the spacing of the lighting.

On a cold day you may need an almost continuous line of fire, whereas on a warm day you may have to widen the spacing to suit the conditions.

This is where a good operator with a sound knowledge of his job can carry on, on his own.

However, where the operator is uncertain of his job, an officer or O/Seer should stay with him, until he is sufficiently trained.

All flamethrowers and P.T.O. units must be in good condition before the start of the season.

When to do it.

To successfully carry out controlled burning with the flame thrower the operator must have a good knowledge of the suitable weather conditions required, and the type of forest he intends to burn.

Burning with the flamethrower is usually carried out in early spring, say August, September, and October, unless it's an exceptional year, it is usually too hot after these months. If used in the autumn it must be late in the season and after heavy rain.

Burning with the wind - this is important. When a suitable day occurs, officers or O/Seers should select suitable burns, get the wind direction and possible changes.

Light only one side of the proposed burns using the wind, then wait for the right day and wind to burn the other side.

By lighting against the wind early in the season will only result in a patchy burn with no depth. Means more patrolling and the danger of the final burn escaping from the Compt.

Dont's.

Don't light if it is too hot - or if you are already committed - stop lighting and cut your losses.

Don't persist if it is too cold - you will only spoil the edge for another day.

Don't light against the wind - as above.

CANVAS HOSE PATCHES.

Fire Control Notes - July 1962 Vol 23, No. 3, contains an article on stainless steel hose patches. These could prove very useful to the Dept., and an effort should be made to obtain or make them. They are cheap and simple of design, are easy to fit, require no tools for fitting, seal tears up to 2" long, and according to the article remain securely in place.

Below are exact measurements to fit:-

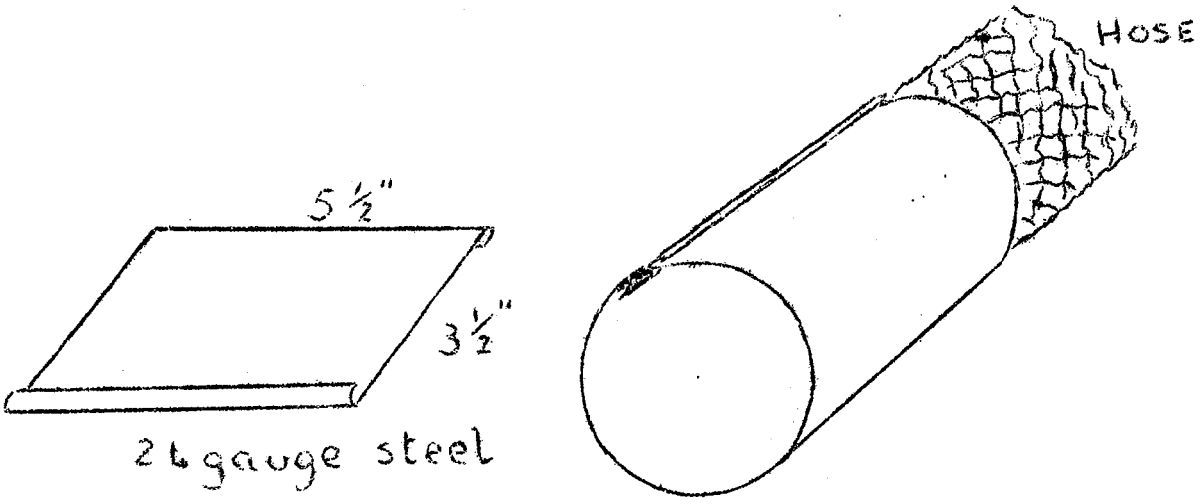
1. Drop pressure in hose - or kink same.

2. Press hose flat - slip patch into place - and snap shut, (with hole on opposite site to join).

3. In-crease pressure.

The patch is slightly smaller in diameter than the hose, and the water pressure holds it firm.

H. E. QUICKE.
Forest Guard.



A FIRE DANGER RATING FOR THE JARRAH FOREST REGION

By G.B.Peet

Both fire suppression and controlled burning are dependent on a daily personal estimate of fire intensity. A fire danger rating has been calculated, designed to assist local forest officers in the northern jarrah forest with daily estimates of fire intensity. This article provides some preliminary information on the fire danger tables.

The fire danger rating is built around fire hazard. The concept of the two measures must be clear. Fire danger is an estimate of fire intensity while fire hazard is an estimate of fuel inflammability. Fire hazard has proven a reliable regional forecasting medium, because of reasonably constant levels of fuel inflammability during the usual fire weather, and the correlation between fire hazard and the profile moisture content of jarrah leaf litter. Fire danger is not a regional forecasting medium. It must be applied to specific forest areas in which the factors affecting fire intensity are constant e.g. wind velocity and fuel quantity.

Fuel inflammability affects fire intensity, hence it is a logical step to link the forecasting medium (fire hazard), to fire danger, by providing loadings which will enable local officers to define fire danger for specific forest areas.

Fire danger is forecast from three variables:-

Fuel inflammability.
Fuel quantity.
Wind velocity.

A basic fire hazard index defining fuel inflammability is loaded with fuel quantity, and wind velocity, to obtain the predicted rate of forward spread of headfire, the measure of fire danger.

The range of fire danger covered in the tables is 0 to 75 ft./min. rate of forward spread of headfire. This range of fire danger is divided into nine classes, based on a colour code.

The rate of forward spread of headfire is a suitable measure for defining difficulty of suppression and method of lighting in controlled burning. The fire danger rating is provided in two parts.

1. Fire Danger Tables.

These tables are designed to cover the weather conditions which may be experienced during a fire season, and are designed primarily to assist in fire suppression. Nine fire danger classes are shown, based on the predicted rate of forward spread in five-year-old fuel; but fuel age corrections are available.

2. Fire Behaviour Guide for Controlled Burning.

This guide is limited to three fire danger classes, Purple, Green and Blue, which represent the controlled burning range of weather conditions.

These tables are designed to provide a standard for preliminary planning, and the daily forecast of fire intensity, which will enable the planned results to be achieved.

A predicted maximum scorch height has been allocated to each fire danger class. Preliminary planning involves allocating an acceptable scorch height to each proposed area and tabulating the specifications. The daily burning programme is implemented by relating forecast fire danger to these specifications.

D.F.O. Campbell is conducting an intensive preliminary planning programme for controlled burning in the Dwellingup Division, and his comments on method of application would have great value as a follow up to this article.

For method of burning the controlled burning guide provides an estimate of the correct strip width and spot distance, to obtain maximum area production and quality of burn.

Scorch Height.

Burning under small size poles and saplings will usually be confined to the Purple fire danger class and Spring conditions, because low scorch height is critical.

Experimental evidence indicates that the moisture content of the outer dead bark of jarrah plays a part in regulating scorch height. Where scorch height is critical it is important to ensure that dead bark moisture content is high enough to prevent flare.

Bark moisture content follows a seasonal trend and is usually higher in Spring than in Autumn. The moisture content of the outer dead bark is related to amount of recent rain.

In addition to a Purple-Spring specification for critical low scorch areas the following is suggested:-

1. If the critical scorch height is 10 ft., the rainfall in the past 14 days should exceed 300 points before the burn is attempted.
2. If the critical scorch height is 20 ft., rainfall in the past 14 days should exceed 100 points before the burn is attempted.

CONTROL OF BLACK BEETLE (Heteronychus sanctae helenae Blanchard) AT HAMEL NURSERY WITH DIELDRIN SPRAY.

By A. J. Hart.

SUMMARY

1. Control was achieved in P. pinaster and P. radiata seedling beds using aluminium irrigation pipes and standard rotating sprinklers (Rain Spray type) with Dieldrin 15% at the estimated rate of .025% concentration in 1800 gallons of water per acre.

2. Control of the initial attack in early summer removes the possibility of a second attack in late summer by killing parent insects.

3. The cost of control is estimated at £18.9.6 per acre being cost of Dieldrin only, water used being also an irrigation measure and not charged.

4. It is not known whether control could be effected by use of knapsack sprays only but considered unlikely due to inadequate wetting of soil.

GENERAL NOTES.

Pine seedling beds were treated on 20/9/63 with Dieldrin at the rate of 1¾ gallons per acre (15% concentrate). Dilution rate with water is unknown, as is the effect on Black beetle population present at that date.

Full scale attacks commenced about the beginning of December 1963 and on 9th December, caterpillars of various species including those of Black beetle were found in seedling beds confirming the cause of increasing deaths of seedlings by cutting near ground level.

METHOD OF ERADICATION.

Standard 2" aluminium irrigation pipes and "Rain Spray" type sprinklers were used with a pump which is estimated to deliver 120 gallons per minute.

A suction valve allowed Dieldrin 15% to be drawn into the system at the rate of about 1 gallon per two minutes through a plastic tube placed in the Dieldrin.

Having drawn the insecticide into the line, fifteen (15) minutes watering followed to disperse Dieldrin from the line. At the above rate of pumping this is estimated at 1800 gallons of water, and using three gallons of 15% Dieldrin represents a concentration of 0.025%.

Prior to sucking in insecticide sprinklers were run for 15 minutes to dampen the soil.

Following dispersion of the insecticide (which appears white with water) sprinklers were run for a further 10 minutes to wash same into the

ground. This treatment was repeated once.

Penetration of the insecticide was estimated at 1½ - 2" as evidenced by the dampened soil. This is probably the most critical factor in achieving success in control of the beetle and caterpillars. For local conditions, this was evidently sufficient because the attacks ceased and dead caterpillars were to be found in the surface soil.

As mentioned, the second attack late in summer, which is a feature of the life cycle of this species, did not eventuate hence it is considered that local eradication may be possible or at least a very high level of control attainable using this method.

It is not known whether knapsack sprays could achieve the same result, but most likely application rate (1800 gal/ac.) would prove too costly for such a method of application of insecticide alone.

Cost of control achieved is estimated at £18.9.6 per acre on the basis of 61/7 per gallon of Dieldrin. Water is not charged as this was also a convenient treatment irrigation of seedlings; also labour is not charged for in this cost.

Time to carry out spraying was about 2½ hours with 2 men, two shifts of piping being involved.

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QUOTABLE QUOTES.

Extracted verbatim from Trainee exam papers, Grimwade 1964.

"The MAI of Grimwade Plantation is 7 loads per annum."

"The effect of zinc on unhealthy pines is fantastic!"

"Rosetting is a disease which makes a tree disorderly."

On sub-division to assist fire control - "Try to have all compartments with a S.W. or S.aspect."

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EUCALYPTS ON DIE-BACK SITES.

By J. B. Campbell

It has been noticed at Willowdale where we have an arboretum of Eastern States eucalypts, established in 1937, that both Tallowwood (Euc. microcorys) and Sydney Blue Gum (Euc. saligna) are beginning to satisfactorily colonise (colony-wise) the nearby Bullich (Euc. megacarpa) gully. Some keen forester transplanted some of these "wildlings" in a die-back site in Nanga block and on a barren site at Tallanalla, and it was noticed that they grew with no further treatment.

Following on these observations it was decided to establish a small plot of Tallowwood on an exceedingly poor "die-back" site between Harvey and Tallanalla. A small area of about two acres was duly cleaned up, burnt, ploughed and planted in 1961.

At the end of one year survival was good and the plants looked healthy, however one half of the plot was given 2 oz. of superphosphate per tree. Today these trees are four to six feet high and those on the supered are more vigorous.

Each year since 1961 a further one or two acres have been cleared and planted. On two plots Saligna has been planted and strangely enough these look even more vigorous than the Tallowwood and show a similar response to super. In 1963 planting copper-zinc super has been tried but we have no results to date.

Because of the nature and appearance of the leaves and the branch formation it is suspected that potash is deficient in these soils and it is intended to establish a plot this year to test this theory.

These trials are by necessity very small but they have shown Harvey foresters that it is definitely worth pursuing these trials further. It is especially hoped that the Tallowwood will continue to live and grow as it produces such high quality wood and we are sure that they can be control burnt. In addition it is proving at Willowdale that it can colonise.

One point that has been shown is that establishment is poor unless the area is ploughed. This is unfortunate as it is costly to prepare the ground ready for ploughing.

This year it is hoped to plant about ten acres mainly in one of the worst die-back areas in Nanga block near the Murray River. Trials will be commenced with other likely species and one that is hoped and thought will be successful is Spotted Gum (Euc. maculata). Mr. Wallace tells us there could be quite a market in this State for wood from this species by way of tool handles.

One of our Editors will be pleased to learn that the Euc. saligna that he helped to measure when he first joined the Department are growing at the rate

of between 15-18 loads per acre per annum to a 4" crown. These figures are very approximate as the areas are so small on the old Willowdale plots.

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FROST DAMAGE.

By S.J.Quain

The severe early frosts this year damaged the crowns of the various tree species in the Gleneagle Division. It also had a very variable effect on understorey species, but these remarks refer to the tree species. Because this frost damage is scattered throughout the forest region both in time and area I do not consider that as foresters we appreciate the effect frosts have on our forests.

All the low lying areas in the Division were badly hit by frost this May and a complete kill of sapling crowns was common. In some areas in the eastern part of the Division the frost damage extended up to the mature tree crowns.

Although all species suffered it was seen that jarrah and marri suffered worst and blackbutt and wandoo a good deal less. Also as could be expected the growing shoots suffered more than the older leaves.

This raises the question as to whether the malformed sapling stands along some sections of the main rivers and creeks are the result of continuous past fires or a combined result of frost and fire. Also has frost been one of the climatic factors affecting the distribution of the tree species in the Jarrah Forest Region.

The opinion that the clear falling operations of the jarrah resulted in malformed saplings rather than a lighter cutting may also be influenced by the effects of frost.

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"BULLION BOXES"

By A.L. King.

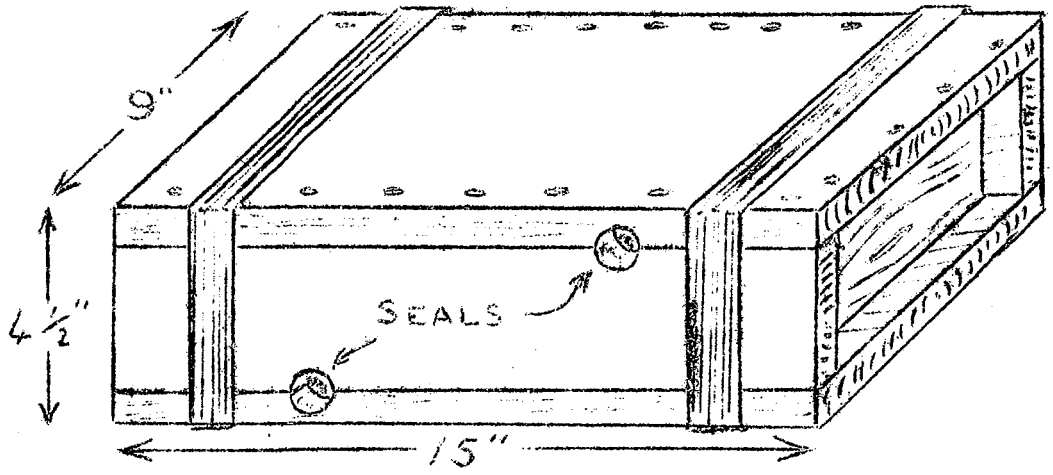
At a recent pine mill-landing inspection in Perth someone happened tobe collecting a consignment of unusual looking boxes which induced me to ask questions, and led me on to an interesting use of a forest product.

The diagram below represents one of the consignment of boxes collected by a representative of a Perth Bank. They are called Bullion Boxes, and are made to order in a furniture factory for the mill, which sells them to the Perth Bank.

Each box is constructed of Pinus radiata timber and contains approximately 2.3 super feet of timber in knot free, whole boards. No joints are wholly apparent on the outside of the box. No nails are used in the construction except to secure the $\frac{1}{2}$" metal straps around the box. The lid is screwed down. Two one-inch holes on each side of the box are for filling with sealing wax thus sealing the top and bottom with the sides. Only knot free timber may be used as knots when drying out cause cracks which weaken the box. The internal cubic capacity of the box is approximately 224 cubic inches and the box weighs up to $5\frac{1}{2}$ lbs air dry.

Each box when filled holds 4 ingots of gold, placed side by side in the box with an averdupois net weight of 118 lbs. Sawdust is used as a packing material between and around the ingots. The gross weight of a packed box would therefore be approximately 126 lbs weight (including sawdust).

Bullion Box



Upon enquiring further at the Bank concerned, after obtaining their confidence that I was not after gold the quick way, I learnt that gold in these Bullion Boxes would be exported by sea and air to any one of four or five gold buyers in the world, e.g. Switzerland. The boxes had to be strong enough therefore to survive handling on a voyage half way round the world; light enough so that freight charges would be kept to minimum; as invulnerable to theft as possible either by breaking open or stealing as one unit; cheap and dispensable and yet appeal to an insurance broker when the consignment came to be insured for the journey.

Metal containers and even single ingots in sacks have been used in gold transfers but the former are expensive and the latter easier to lose and require more handling.

The bank pays 25/- each for a box which encases approximately £27,935 worth of gold, at a current price of £15.12. 6 per ounce. Surely no other Forest Produce has such a high value attached to it per cubic inch as the Pinus radiata in a Bullion Box.

GROWTH CONSIDERATIONS IN CONTROLLED BURNING OF THE JARRAH FOREST

by G.B. PEET

The reasons commonly associated with favouring Spring above Autumn as a season for controlled burning include: inflammability of the ground wood, difficulty in holding an edge, and lack of soil and bark moisture.

Perhaps a more important consideration lies in the form of annual growth of jarrah, and the ability to conduct controlled burning when the trees are most able to withstand fire damage.

Three growth factors are thought to influence the period when maximum benefit is obtained from controlled burning:-

(1) Periods when growth is at a peak.
(2) Period of leaf replacement.
(3) Period of maximum fire resistance.

It is probable that (3) is dependent on (1) and (2) and this hypothesis is discussed below.

(1) Peak Growth Periods

Work by Podger and Loneragan indicates that jarrah forms annual growth rings. The form of annual growth could be an important factor in limiting damage from controlled burning.

The expected form of annual growth is shown on Graph 1. The graph was drawn from the average monthly growth of 30 plots located in a dense jarrah pole stand near Dwellingup. Each plot contains five dominant or co-dominant poles, fitted with band dendrometers, and mean plot GBHOB growth is recorded every month. The term "monthly growth" is not strictly correct as the measurement period fell on the 13th. day of each month, e.g. growth in May is the period between 13th. May and 13th. June. However listing by month will serve these purposes.

Growth data obtained by Podger has shown a flush in Spring and Autumn, and the trend is further supported by results from the Willowdale sample tree (Loneragan).

Accepting the trend in Graph 1, annual growth can be described as follows:

(a) Growth at some level is maintained throughout the year except in December when there is evidence of dormancy.
(b) Most of the growth occurs in two flushes, one in Spring with a peak in October, and one in Autumn with a peak in May.
(c) Growth is maintained, but at a low level, during the Winter and Summer months.

(2) Leaf Replacement

Graph 2 shows a monthly trend in terminal leaf moisture content of jarrah saplings. The sudden rise in December is associated with leaf replacement, i.e. the young leaves are succulent and have a high moisture content.

(3). Period of Maximum Fire Resistance

Hare(1961) states - "season of burning may influence not only direct fire damage but the ability of the plant to recover from injury by sprouting or refoliation". He also states "food reserves seem to have a direct effect on heat resistance as well as on sprouting capacity." Julander concluded that any treatment that increased food reserves improved the resistance of the plant to heat.

The annual growth trend in jarrah indicates build up of food storage probably occurs in the Winter months. This Winter food storage would be released in the energy required for the Spring growth flush, in Summer leaf replacement, and in the Autumn growth flush.

From a controlled burning viewpoint, trees could be expected to be most resistant to fire damage in Spring, and least resistant in Autumn.

Discussion

It is thought that resistance to fire damage resulting from food storage build up will favour Spring burning. The period of leaf replacement again favours Spring burning.

Autumn scorch will probably inhibit wood production for the current year, because leaf replacement is delayed until the following Summer.

Reasonable normality of growth could be expected after a late Spring burn. This burn will only affect the tail of the Spring growth flush, and it takes place before leaf replacement.

Assuming these hypothesis are correct every effort should be made to complete the major part of the burning programme in late October and November, i.e. at the tail end of Spring growth and before leaf replacement.

Trees are probably least fire resistant in Autumn, and a scorch before the Autumn - early Winter growth flush is likely to inhibit growth during that year. It would follow that Autumn burning is an unsound silvicultural practice, although some burning is undoubtedly necessary for fire protection e.g. cleaning out flats and gullies which won't burn in Spring.

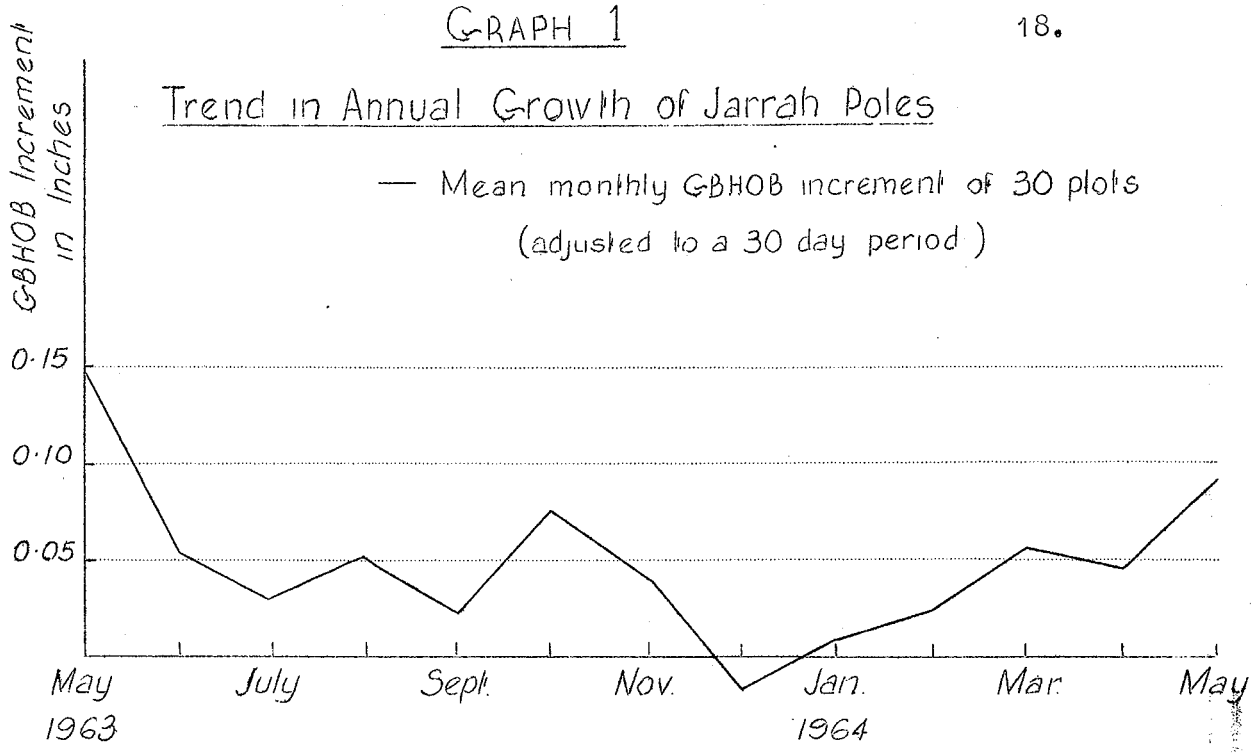
REFERENCES

Loneragan, O.W. and Podger, F.D. (personal communication)

U.S., Agric., Dept. of. Sthn. For. Exp. Stn. Occ. paper 183 "Heat effects on living plants". by R.C. Hare.

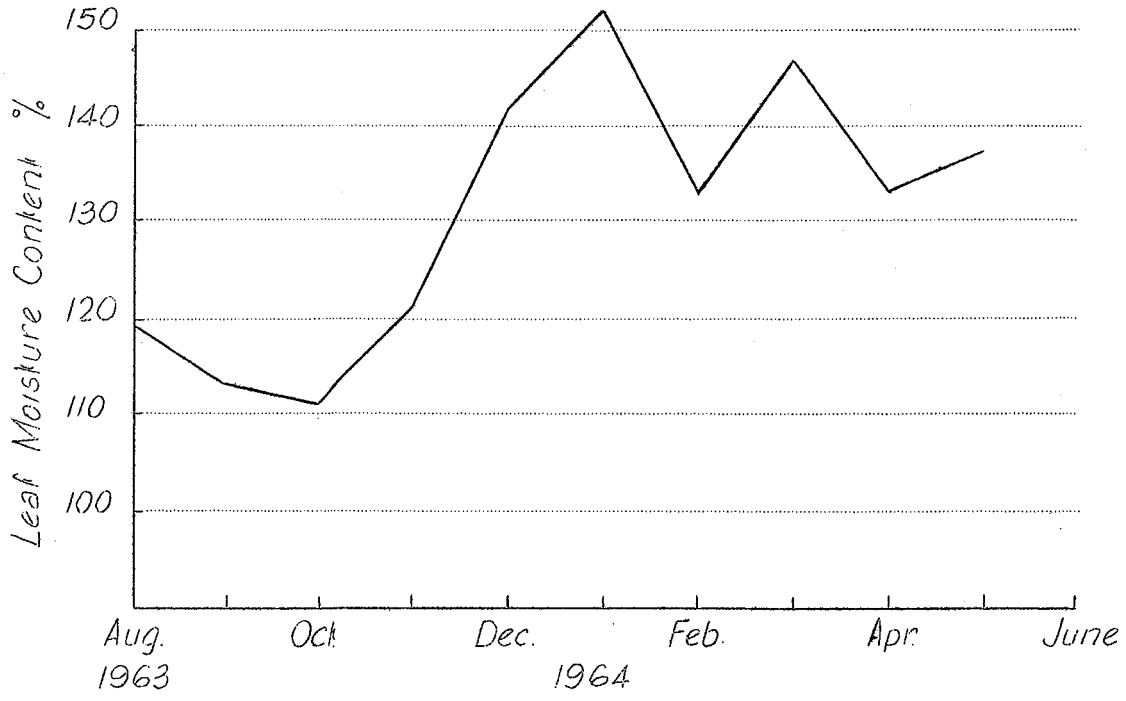
GRAPH 1

Trend in Annual Growth of Jarrah Poles



GRAPH 2

Monthly Trend in Terminal Leaf Moisture Content of Jarrah Saplings



EVOLUTION OF P. RADIATA SOIL SURVEY IN W.A.

By A. L. CLIFTON.

Soil survey for P. radiata growing is highly specialised. Hence there is ample justification for breaking away from the standard method of soil classification, based on colour and texture of profiles, and using local names for the types identified.

This breaking away has been going on piecemeal over many years.

The earliest soil surveys of P. radiata plantations were carried out by J. O'Donnell in 1935*, using the standard method. However correlation of types with P. radiata site quality was not generally consistent.

Four associations and 12 types with several phases in each were identified. This method was used until about 1941 when the work ceased. After the World War, in the 1950's the work was carried out again by Van Noort, using O'Donnell's four associations for broad scale reconnaissance surveys.

Detailed surveys, using systematic grid followed, with variations being mapped as phases. After 1956 the "Alluvial" association was dropped, and "Metamorphic" included with the other three - (Basic, Granitic and Lateritic.)

These association names are still used, and refer to the nature of the parent materials from which the solum is derived.

In 1960 a convention was introduced on soil plans to indicate 3 grades of suitability for P. radiata in addition to existing information. The grades were suitable, doubtful and unsuitable.

The inclusion of the "Plantable Limit" or "Soil Boundary" came in a year or so later.

This information on the soils is all that the man in the field requires.

The system worked very well in the northern divisions where differences are quite clear-cut. However it has been a headache in the Karri forest belt, where nearly all laterites are in an advanced state of truncation and there is bewildering variation in the parent rock types, to say nothing of anomalous chemical analysis figures and recent-lateritisation effects.

This would have made the soil plans for the Southern region very complicated, so another method was developed.

This divided the association up into phases based on suitability and is currently in use. It eliminates unnecessary phase boundaries which had little bearing on suitability. Thus deep sands and pale shallow clayey soil can be lumped together in a single phase unit i.e. granitic - unsuitable. Lower case letters after the association capital letter denotes these phases. e.g. the above is "G(c)" while a suitable phase is "G(a)".

The table below should indicate the use of this convention - and further details can be obtained from my dissertation 'Soil Surveying for Pinus Radiata in Western Australia' available from the Forests Dept., Library.

However this writer feels the need to subdivide the classes into more groups for the use of planners, hence the use of half-phases e.g. "G(a-b)", and the use of 6 suitability groups, and a total of 14 phases to be used.

Productivity Class	Genetic Class (type or association).	Present Phase Symbol.	Probable SQ	Broad Suitability Range. (Present system).	Symbol used on soil plans.	Proposed future nomenclature of phases
Excellent	Basic Granitic	B(a) G(a)	1 - 11			A
Good	Basic Granitic	B(a) G(a)	111	Suitable	None	B
Satisfactory	Basic Granitic	B(b) G(a-b)	1V			C
Doubtful	Basic Granitic	B(c) G(b)	V and poorer	Doubtful	o	D
Submarginal (May be worth experimenting with fertilizer treatments etc. in future).	Basic Granitic Lateritic	B(c) G(b-c) L(a)	Probable Fail.			E
Useless	Basic Granitic Lateritic	B(c) G(c) L(b),L(c)	Certain Failure	Unsuitable	ø	F

It can be seen from the table that the present phase symbol scheme is unsatisfactory - e.g. "B(c)" occurs in 3 different groupings.

Obviously a simpler system would be to adopt the 6-phase system shown in the right column of the table - it uses Capital letters and corresponds to the 6 suitability ratings.

The old associations need not be dropped, as they are still quite useful checks on the soil surveyor's work.

This system, using 5 classes (A - E) was found to be quite workable in a 25,000 acre reconnaissance of coastal sands in the Pemberton Division.

* See "Soils of the Mundaring Weir Plantations"; by J.O'Donnell. 1935.
$ "Solum":- A and B horizon excluding the overburden of organic matter, litter etc.

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MANUE & DAVEY BORER.

The "Ruddy Twister".

BY A.B. Selkirk.

He was a long lean type with that perpetual problem of having scarcely enough hip section to hold his trousers up and it was always my secret doubt that the machine may not finish its run before a slip occurred.

But there was certainly no doubt in the long lean mind when I said,

"I'm expected to make a report on this machine."

"Make it a ruddy good one then, I don't want to go back to that ruddy hand twister again," came the quick retort.

The words flash immediately to the point; to go back to the slow arduous hand tool after weeks of successfully operating a mechanical tool would certainly be a backward step.

The boring machine has been used over a period of several weeks on the building of a 44 ft. two span, vertical pile bridge. Construction timbers were Jarrah and Wandoo with a maximum cross section of 24 inches.

Most of the boring was done with a $1\frac{1}{8}$" bullnosed type auger, the shank of which had been extended with a length of $\frac{1}{2}$" stainless steel rod giving an overall length of 32".

The bullnosed type auger was found to give better results as it withdrew much quicker than the worm tipped type, and frequent withdrawal seemed to be the secret of successful operation.

The use of this small piece of equipment opens up possibilities in the economical construction of solid stringer type bridges, and large culverts where expensive large size concrete pipes are frequently used but not always with success.

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FLASH BACKS.

By J.B.Campbell

Checking an old report on a Myalup experiment on Minor Elements showed that in 1936 foresters were really keen.

I quote: -

"The treatments were randomised within each block after the trees had been pegged and numbered (1 to 85)

The unit was a single tree and there were five replications.

1% solutions were used resulting in an application of 1½ pints per tree "poured", and ½ pint per tree "sprayed".

A non metal spray, glass containers, distilled water and reasonably chemically pure salts were used.

The "pourings" were done on the 13th February, and the "sprayings" of Boric Acid and Ferrous sulphate were applied in daylight between 6.30 and 7.30 p.m. on the 13th.

The "sprayings" of Sodium Hydrogen phosphate, Copper sulphate, Cobalt chloride, Nickel chloride, Sodium chloride, Zinc chloride and Manganese sulphate were applied by moonlight between midnight and 3 a.m. on the 14th February.

The heights of the treated pines were measured and recorded together with notes describing the general condition of each pine."

On checking the persons concerned I found that the three foresters were Dr.T.N.Stoate, G.Chandler and B.H.Bednall. I questioned Mr. Bednall about this and he remembered the occassion. He said, "Stoate carried the books, Chandler carried the gear and I carried the --- ... (refreshments)."

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A HOT TIP.

By D.R. Doley

An observation which was recently made in the karri forest brought to mind an interesting discussion in these pages two years ago. An experimental felling plot was established in Collins Block, east of Pemberton, in 1958, and logging was carried out on four of five strips, each four chains wide, in the winter of 1959. The fifth strip was retained as a control by which to compare the development of the other treatments. The whole area was burnt for regeneration in January, 1964.

During a girth enumeration in June, 1964, it was observed that some of the aluminium tags, about 1/16th inch thick originally, and located 5'3" above the ground, had partially melted. The offending tags were found on trees in the untreated strip, all others being equipped with copper tags. The aluminium in the tags concerned had melted and run to the lower end of the tag, while the aluminium oxide coating had remained intact, preserving the form of the marker except that most of it was about as thick as cooking foil with a dob of metal at the bottom. The numbers were still visible due to the ridges of metal forced up around the patterns during stamping, a most fortunate phenomenon for the measurers.

The ground burn in the area was not very good, a considerable amount of partially decomposed litter remaining after the fire. Several trees about 200 ft. high, however, were defoliated, and many suffered damage to the bark at the base. Undergrowth and sapling regeneration of karri were relatively thick, evidently carrying the fire above the ground for part of its course up the hill.

In the issue of March, 1962, Mr. Williamson reported the melting of tags during the Dwellingup fire of 1961. The temperature of the fire at 5'3" from the ground was concluded to be at least 1,200°F. Workers at the Southern Forest Experiment Station, U.S. Forest Service, quoted in the same issue by Mr. Wallace, found that temperatures one foot from the ground were three times as high as those at four feet. It seems apparent that the conditions of the experiment in the Southern States differed from those obtaining at Dwellingup in 1961, and at Collins in 1964. A temperature of over 3,000°F is hardly likely at one foot from the ground when part of the litter remains unburnt on the forest floor. Without further information than can be obtained from an inspection six months after a fire it is futile to speculate on conditions in a fire front. That the phenomenon reported here occurs, however, should emphasize the necessity for more work on an important aspect of our forest management.