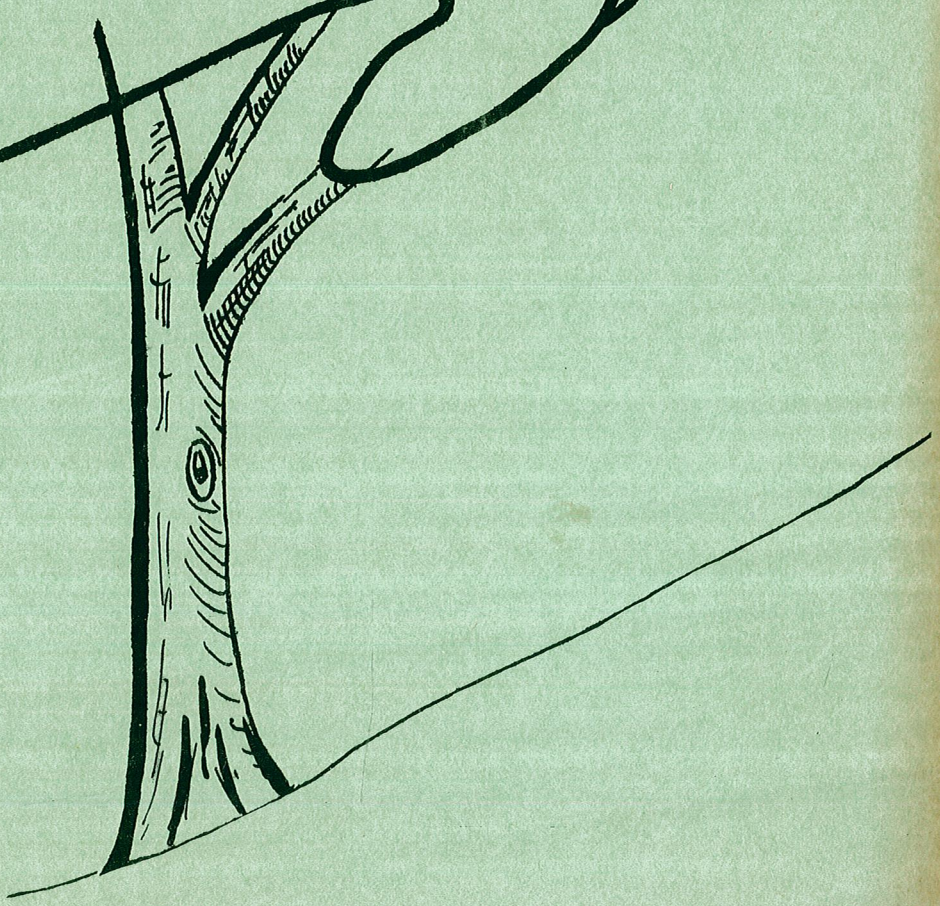
FOREST NOTES



FORESTS DEPARTMENT
PERTH
WESTERN AUSTRALIA
VOLUME 3 NUMBER 2

CONTENTS

Vol. 3, No. 2.

EDITORS NOTE

June 1965

At the time of going to press it appears that we are once again running short of articles for 'Forest Notes', the excellent response to our previous calls seems to be on the wane.

After the encouraging results from our calls over the last few months this is rather disappointing and we hope it is only a temporary 'hibernation', perhaps both blood and ink will flow more freely at the prospect of spring!

As we promised in the March issue of 'Forest Notes' we have reserved a section for letters to the editors, the letters received so far are included in this issue and it is hoped that we will be able to make this section a regular feature - so keep the letters coming in.

Remember the closing date for the next issue is 1st September 1965.

P. N. Hewett J. A. W. Robley

JOINT EDITORS

OBITUARIES

W. M. Cusack

Old officers may be interested to learn that Forester W. M. Cusack passed away on the 24th March, 1965, aged 93 years. Mr. Cusack commenced duty with the Department on the 1st April, 1914 and retired on the 31st March, 1932. He was subsequently employed as an Overseer at Collier and Gnangara plantations, and continued with the Department, until 10th December, 1936.

Richard Witnish

Assistant Forester Richard Witnish, formerly of Kirup, who retired from the Forests Department on the 11th August, 1954, passed away at the age of 75 years on the 20th May, 1965.

Officers who were closely associated with him at Kirup in Messrs. G.E. Brookway and A.R. Kelly, attended the funeral at Karrakatta on Monday, 24th May. Mr. Kelly returned to Kirup that day and suffered a fatal heart attack on the night of the 25th May.

The Editors,

Dear Sirs,

I enclose herewith a short contribution to the next issue of Forest Notes, and at the same time would like to express my gratitude to the Editors for extracting me so satisfactorily from the dilemma I was in, in the December issue. Incidentally the bull fighting season has just opened again, and I hope to be able to further my experience of the sport - as a spectator of course.

With regard to Forest Notes, I would like to say that I look forward very much to receiving it and enjoy each number as it comes to me. I have felt ever since this publication was first produced that it fills a real need, and that one of its main advantages is that it offers an opportunity to our staff, particularly my fellow members of the General Division, to practise getting their ideas down on paper. Looking back through old Departmental files at some of my efforts at compiling letters and reports as a young man, makes me realise how much I had to learn. Any improvement anyone can notice since those days is purely the result of practice.

As a member of the staff a long way from home, might I commend the idea of your inclusion of the section Staff Notes. This is a good idea and a section I would like to see enlarged; perhaps you could persuade the Staff Clerk to let you have a note for each issue summarising transfers, retirements and appointments. It is very nice to know where everyone is and what they are doing, and what changes, if any, are taking place.

I have just received the sad news that my old mate and good friend Claude Kinsella has put out his last fire and compiled his final monthly report. He joined the Department some 47 years ago at the beginning of a new era in its activities, that is in 1918 with the passing of the Forests Act. The Department had launched a scheme to train boys, by a system of apprenticeship, to be Foresters, and Claude was amongst the earliest to be selected. He and I worked together as boys and as young men and there was never a dull moment when he was around. The Forests Department was his life's work. Most of us know and have seen the magnificent grove of pines that comprise Compartment 3. Greystones in the Mundaring division. Claude helped to sow the seeds and tend the plants in the old Greystones nursery, and when the time came assisted to plant them out. I do notthink any man could hope to take part in creating a more fitting monument to his sojourn here.

Claude was a good mate, a good friend, a hard and conscientious worker for the Department and a first rate Forester, and we are the poorer for his passing.

Yours faithfully,

D.H. Perry.

The Editors,

Dear Sirs,

BROWN WOOD IN KARRI

Further to comments by O.W. Loneragan and the late A.R. Kelly on "Brown Wood in Karri", readers may be interested in the following extract from an article by P. Rudman (C.S.I.R.O.) on "Durability in the Genus Eucalyptus" in Australian Forestry, v. 28, no. 4, 1964.

"An examination of the relation between colour and decay resistance in E. diversicolor outer heartwood showed that although very pale "creamy" E. diversicolor did tend to be more susceptible to decay, it was clear that, in general, depth of colour did not indicate resistance since the darkest specimen was one of the least resistant and the most resistant specimen examined was classed as lighter than normal in colour".

Rudman goes on to say that in both Karri and Jarrah, timber which is markedly lighter or markedly darker in colour than normal, durability tends to be lower than normal, but that within these two extremes, susceptibility to decay is not related to colour.

Yours faithfully,

R.J. Underwood

MICHIGAN MESSAGE-STICK

The Editors,

Dear Sirs,

It seems that I have absorbed the way of life here so that it doesn't seem unusual anymore. At any rate, I can't think of a suitable item for Forest Notes. I also have quite a few papers to hand in now, so this is keeping me very busy. Perhaps if I see some forested areas this summer I may come across something of interest.

Regards,

Jim Williamson

SAFETY CAMPAIGN

In view of the scarce supply of safety posters with a direct application to Forests Department activities, we offer you, at no extra cost, the drawing below and its caption.

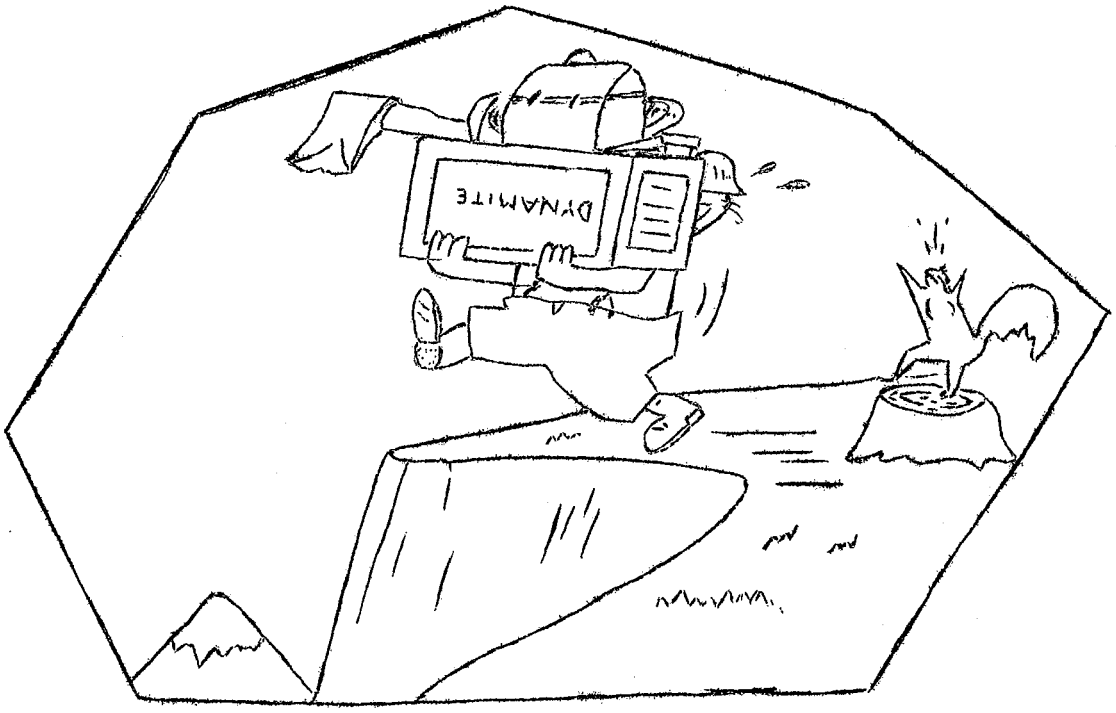
This is intended to be the first of a series, and we would suggest that you enlarge it to showcard size by the normal graphical method.

a) "Carry your saw and other tools safely."

b) "Always have a clear view ahead."

c) "Watch where you are going."

d) "Be sure you have a solid footing."



EDITORS

TALLOWOOD POLES

by J.B. Campbell

Recently the small tallowood plot at Willowdale was evaluated for S.E.C. pole production. With the present concentrated drive on S.E.C. poles, foresters have become very conscious of the great demand for poles.

The Willowdale plots, which measure approximately 18 yards by 18 yards with trees spaced at 7 feet by 7 feet, has the following acceptable poles:

30 fts	-	12
35 fts	-	6
40 fts	-	10
45 fts	-	5
50 fts	-	2
55 fts	-	3
60 fts	-	1
TOTAL:	-	39

Taking the plot to represent approximately 1/10th acre this is 390 poles per acre in 30 years.

The gross value on the Perth market for these poles would be £300.0.0. on the plot or £3,000 per acre, or £100 per acre per annum.

The royalty value per acre would be £1,170.0.0 in 30 years or £39 per acre per annum.

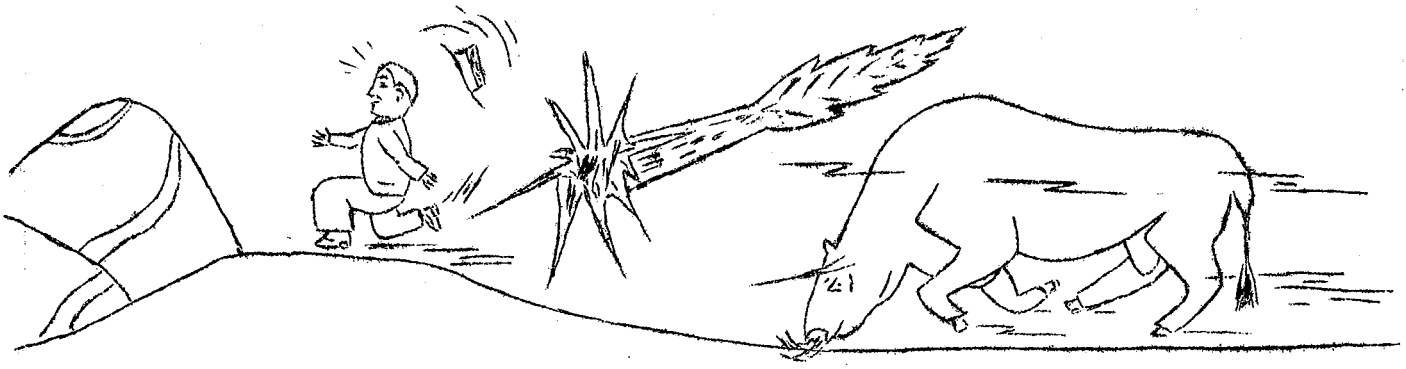
These figures seem exceptionally high but have been checked. The present demand for poles on the Perth and Northam markets is in the vicinity of 12,000 per annum and this figure is growing. There are other requirements on the Great Southern and Geraldton areas and a figure of 18,000 per annum would not be too great. The jarrah forest will eventually yield this quantity quite easily but for a period it will probably be difficult to meet this demand.

The figures are derived from a very small area, and are therefore suspect, but even at half this level they are good.

The potential for growing poles has been largely overlooked and with these figures we could well embark on an increased planting of tallowood on all types of soil. Essentially the soil needs to be deep and well drained. As reported in an earlier Forest Notes, this species is doing well and continues to do well, on poor die-back sites in Harvey and every endeavour is to be made to increase the area of planting. At the level of the above plot it is much more lucrative than pine planting.

There must be a lot of older foresters wishing they had planted 10 acres of tallowood on deep, well drained soils about 30 years ago.

****



EUCALYPTUS CALOPHYLLA - THE TREE OF THE FUTURE

by D.H. Perry

Most of us tend to look upon the ubiquitous Marri as something of a nuisance, a species which does its level best to grow luxuriantly in those places where we are doing our best to grow something else, Jarrah for instance. Prior to hormone sprays it was a mighty difficult tree to discourage. It has occurred to me, that in view of such tenacity, we should change our ideas and reorient our thinking about this tree. We have a new tool at our disposal these days, which if we care to use it, could change the whole situation with regard to Marri, making of it a highly desirable and sought after tree. I refer of course to tree breeding.

How many of us have paused to consider the good qualities of this species, of which the following come to mind:-

1. Very adaptable as regards soil requirements.
2. More drought resistant than Jarrah.
3. Relatively easy to establish.
4. Very fire resistant.
5. Produces a timber that is strong, durable, easy to work and with an attractive grain, and seasons with a minimum of degrade.
6. A producer of top quality honey in quantity.
7. A rapid rate of growth.
8. Coppices freely.

There may be some more but that will do to go on with. Potentially this is a most valuable tree, but unfortunately to offset the qualities outlined above, the tree contains an excessive number of gum pockets and veins which render it uneconomic to mill. Some milling of this species has taken place in the past in favorable localities and is perhaps continuing. As hardwood becomes scarcer and more expensive its use will increase despite its disabilities.

Talking of milling Marri reminds me of the occasion some years ago when we were milling some logs of this species at Gnangara. I had just driven up to the mill to see George Reynolds, when he came staggering out, covered from head to foot with what at first glance looked like blood, and clutching what I thought was the stump of his arm. Closer inspection revealed the fact that the arm was still in place and all the blood was Marri kino. He had just cut through a large pocket of watery gum and the saw had thrown it all over him. Looking out he saw Dick Perry pull up and immediately thought there was a chance he could throw a scare into him. How right he was!

Milling operations have shown that Marri trees do occur which are almost entirely free of gum veins, and it is highly likely that this factor is under genetic control. In order to determine this point we will need to find some twenty or thirty plus trees with top vigor, high quality boles and an absolute minimum of gum defects. It should be possible with cooperation from Divisional Officers, to locate these trees during routine marking operations. Test cores could be extracted later for analysis, and in this connection I understand that C.K. Pawsey of South Australia is developing a power driven gadget for extracting 2" diameter cores. Another suggestion is that if milling of Marri is taking place at some centres and a log of outstandingly high quality is felled and milled, if the stump could be located and marked, scions for grafting could be obtained in due course from the resulting coppice.

Once the plus phenotypes have been located the rest is just a matter of time and perseverance. At present our breeding station is in over its ears with Pinus pinaster and Pinus radiata, but at least a start could be made to select the trees on which to base a breeding programme. Professor Pryor of the National University at Canberra has done a lot of the ground work in developing the techniques to enable the grafting and pollinating of Eucalypts to be carried out, so what are we waiting for?

Any comments from anyone that can be heard over the cries of auguish coming from the staff of our breeding station, would be appreciated.

****

PROGRESS IN THE USE OF ARBORICIDES IN JARRAH SILVICULTURE.

by P.C. Kimber

Introduction.

It is becoming increasingly obvious that intensive silviculture in Jarrah cannot be practised without the use of efficient tree-killing chemicals (arboricides). A series of investigations into the best type of chemical and the method of application to the tree have been in progress in the Dwellingup Division over the last fifteen months. This article summarizes the findings to date from these investigations.

Chemical details.

Chemicals used as arboricides can be roughly divided into two groups:-

(a). Contact poisons which kill any living tissue with which they come into contact. Examples are compounds of arsenic and ammonium sulphamate (ammate).

(b). Systemic poisons which are absorbed by and move around in the tree, and kill by slowly building up to lethal concentrations in the growing tips (i.e. buds and/or root tips) or by blocking (or inactivating) the cells or tubes through which the foods and water of the tree are carried. In this category come 2,4,5-T, 2,4-D, and Tordon. These are commonly known as hormone poisons.

In describing the amount of a chemical, or the concentration of a solution of it the term acid equivalent (a.e.) is used. This means the amount or concentration of the active part of the chemical. As an example we can take the 2,4,5-T normally used by the department. This is called 80% a.e. solution and means that 80% or 8/10ths of it are active chemical.

When dealing with hormone poisons very small amounts are necessary and these are given in this article as c.c. (cubic centimetres) of which there are 4,546 to the gallon, or grammes (gm) at 454 to 1 pound.

Killing Jarrah Poles in Thinning.

a) Using contact poisons.

Two contact poisons have been tested on Jarrah and both, although capable of killing pole-sized stems, prove far more expensive than the currently used 2,4,5-T.

(i). Cacodylic acid - a chemical containing arsenic which is less poisonous to humans than the usual sodium arsenite used for tree killing. It is sold as a powder (which will mix with water) under the trade name of "Ansar". The powder contains 65% cacodylic acid. Applied to Jarrah poles at the rate of 6gm. powder in water/tree it appears to be giving a good kill but costs four or five times as much as a killing dose of 2,4,5-T. Less than 6gm. will not kill.

(ii). Ammate - applied to notches cut round the base of the stem at a rate of 8gm./tree it resulted in complete defoliation but trees subsequently recovered.

The dose recommended by the manufacturers is 2 ozs. (56gm.) which would cost six times as much as a killing dose of 2,4,5-T.

b) Using hormone poisons.

Investigations have been concentrated on this type of arboricide and on the most efficient methods of getting it into the tree. Each chemical tested is dealt with separately below.

A. 2,4,5-T. This product is commonly sold in two forms; one, the ester, is that which is currently used by the department. The ester will mix with oil (distillate or kerosene) but will only mix with water when an emulsifier is added. Departmental supplies already contain an emulsifier so will mix with water. The other form of 2,4,5-T is the amine which will mix with water but not with oil.

(i) Tests have been made spraying 2,4,5-T solutions into basal frills in Jarrah poles in the range 19" to 35" G.B.H., with the object of determining the minimum concentration of 2,4,5-T necessary to kill the tree, comparing the ester and amine forms, and comparing the ester form used with distillate and water. The results of these trials confirmed the following points:-

(a). 2,4,5-T ester is more efficient applied in distillate than in water; a 2% solution in distillate is adequate to give 100% kill applied in the Spring to Autumn period. For the winter months the concentration should be increased to 4%. In all cases enough poison mixture should be sprayed on the basal frill to thoroughly wet all cut surfaces.

(b). 2,4,5-T amine, although it can be mixed only with water, is slightly more efficient than the ester. Its greater killing power is, however, more than offset by its much higher price than the ester.

(ii) Overbark basal sprays have also been tried using 4% 2,4,5-T ester in distillate. This method demands that the bottom foot of the stem be sprayed with poison mixture until it begins to run off - known technically as spraying to refusal. Due to the thick bark of pole sized Jarrah large quantities of poison solution, in excess of 1 pint per tree, are required and the results are disappointing, especially in the larger sized stems:-

Pole size.	Percentage deaths after 15 months.
12" - 19" G.B.H.	50% (deaths are continuing)
20" - 27" G.B.H.	10%
28" - 35" G.B.H.	0

The method has been proven as satisfactory on large coppice stems before thick bark begins to develop.

In an attempt to avoid the costly operation of frilling, trials have been made placing the poison mixture into notches cut at intervals round the tree at waist level. These trials have given 70% certain deaths and 25% probable deaths within 15 months. Trees classed as probably dead have been leafless and free of epicormics and coppice for over 1 year but still retain small patches of green tissue

beneath the bark. Other points of interest to arise from the trials are:-

(a). The minimum effective dose of .2,4,5-T ester per pole (of 20" - 25" G.B.H.) seems to be 2.5gm. a.e., (20 c.c. of 12½% 2,4,5-T ester in distillate).

(b). Notches should be approximately 6" apart and the dose of poison for each notch 5 c.c. to 7½ c.c. of 12½% ester in distillate. (Quantity can be reduced if concentration is raised accordingly).

(c). There is evidence that better results may be forthcoming from trees notched at waist level than those notched at ground level.

(d). To date the best notching tool appears to be a hatchet with the cutting end ground down to approximately 1½" width. A sheep drencher, graduated in 2.5 c.c. divisions, is used to apply the poison.

B. 2,4-D. A hormone poison not normally recommended for use on trees; it has been tested out of interest and has given surprisingly good results. 4% solution of 2,4-D ester in distillate applied to a basal frill gave over 80% deaths after 15 months. It is, as was expected, less efficient than 2,4,5-T.

C. Tordon. A new chemical which has only recently become available. Two trials have been made applying the chemical intonotches. The first trial, started when little was known about Tordon, demonstrated that 1gm. a.e. per pole (approx. 24" G.B.H.) was more than adequate to give 100% kill. A later trial which is as yet incomplete, has indicated the following:-

Dose per pole.	Effect 4 months after treatment.
0.4gm. a.e.	100% crown deaths. No epicormics or coppice.
0.08gm. a.e.	76% crown deaths, no epicormics or coppice. 24% crowns dead apart from a few green leaves.
0.04gm. a.e.	57% crown deaths, no epicormics or coppice. 43% crowns dead apart from a few green leaves.

Evidence from the silimarity of reactions of trees in earlier notching trials with 2,4,5-T leads to the conclusion that the 0.08gm. treatment will almost certainly result in 100% deaths. 0.08gm. a.e. is the amount contained in 10 c.c. of 0.8% solution.

Anyone who intends making trials along these lines is advised to place notches approximately 6" apart at waist height and to use 2.5 c.c of 1% solution per notch. This will give a dose of 0.1gm. a.e. per pole of 24" G.B.H. and the cost of chemical will be two-thirds that of 2,4,5-T.

Where larger or smaller stems than 24" G.B.H. are treated, the 6" notching distance will automatically cause the necessary increase or reduction in the dose of chemical given.

Tordon is available only as a mixture with 2,4-D under the trade name "Tordon 50 D." The mixture contains 5% a.e. Tordon.

Foliar sprays.

a) On Jarrah Coppice.

Emphasis has been placed on testing low volume sprays of 2,4,5-T. Current departmental practice is to use high volume sprays which aim to completely drench coppice shoots with poison solution.

Where dense areas of coppice are to be treated using high volume sprays, water will be found to be the most costly item; 100 to 400 gallons per acre treated being required. Low volume sprays aim at getting a good cover of poison on the coppice at the rate of 5 to 10 gallons/acre. A knapsack-type motor mistblower is used to apply the poison solution.

Both 5 gallons of 8% 2,4,5-T ester in distillate/acre and 10 gallons of 3% acre have given good top kill of coppice up to 4' high with very little reshooting 9 months after the treatment. Fine sprays of distillate as were necessary are very unpleasant and a small trial was made using water as a carrier. Good top kill resulted from 4% 2,4,5-T in water at 10 gallons per acre and also 1% Tordon at the same rate.

With low volume water sprays a spreading chemical (surfactant) must be used at the minimum rate of 1 part per thousand (0.1%) of the spray mixture. The more that is added, up to about 1%, the more efficient will the poison be. The spreader used in the above trials was "Agral L.N."

In low volume spraying it is necessary to have a very fine mist spray and this may drift over considerable distances. It should not be used within a mile or more of orchards, gardens, or agricultural crops.

b) On Acacia pulchella.

Using low volume sprays as described for use on Jarrah coppice, good kills have been made using 5 gallons of 2% to 4% 2,4,5-T/acre in either water or distillate.

c) General.

The use of low volume sprays is still at experimental level and their wide-scale use is not recommended at present.

d) The use of Tordon.

The following notes on using Tordon as a foliar spray may prove useful to officers testing this chemical:

(1). According to the manufacturers, pines are highly susceptible to Tordon and may be affected by doses of $\frac{1}{2}$-1 lb. a.e./acre (or a 0.05% solution).

(2). Tordon can be absorbed through the leaves or, if applied to the soil, through the roots.

(3). Recent trials of foliar sprays of Tordon on Jarrah coppice have been very disappointing using the form of the chemical known as 22K. It is expected that better results may be found with the 50D, and with other forms if they become available.

MINOR SPECIES - AND PROBLEM SITES

by A.L. Clifton

There are several valuable trees growing in our forests which deserve more attention. For instance:

She-oak	Casuarina Fraseriana
River Banksia	Banksia verticillata
Warren River Cedar	Agonis juniperiana
and possibly	
Bullich	Eucalyptus megacarpa

The value of sheoak is two-fold.

It is decorative and is dimensionally stable when dry. Hence its use for barrel staves, and decorative panelling and in furniture. Its uses could be expanded considerably.

River Banksia is a particularly beautiful wood and is scarce and costly.

Warren River Cedar is a light, strong, and particularly valuable for boat building.

Bullich is said to be ideal for turnery.

All these species reach their best development on what are considered inferior sites - and usually regarded as problem areas. They are given treatment, which can only be described as destructive. "Burn it as hot as possible" is the usual attitude to such sites.

While it must be conceded Sheoak grows well in prime jarrah forest, it also does well on poor, dry sand country where jarrah production is low. Sheoak is rather susceptible to damage from hot fires, and present treatment is causing losses of valuable wood every year. There is a case for reserving this country for Sheoak production, and a reason for careful prescribed burning or even full protection, if necessary. There are many such areas in the south.

River Banksia:

This tree grows well along the valleys of well defined watercourses in the jarrah forest. There must be hundreds of miles of such sites a chain or two wide, capable of producing a crop of this splendid tree. Well established River Banksia will suppress the scrub growth greatly feared in but largely fostered by current controlled burning attitudes. It is a pity that even light burning will kill River Banksia. The present state of development of northern divisions could possibly permit protection of some of these gullies and thereby increase their productivity.

Warren River Cedar:

Occupies swampy sites - often associated with River Banksia along the edges of streams in the karri forest. Also there are considerable areas of flat

swamp country in the south which is capable of carrying healthy stands of Warren Cedar. Again, these sites are all burned very thoroughly as they are regarded as fire hazards.

Bullich:

The natural habitat of this species constitutes the wet, sandy spillways - aquifers - at the heads of permanent streams in jarrah forest region, and practically any wet sandy site in the Karri forest, where the water is on the move, not stagnant.

This species has also been noted on siliceous-ironstone country in the Donnybrook Sunkland, suggesting that, like flooded gum, it will grow under a range of conditions, but can compete best under those conditions mentioned before.

One could go into minute detail defining the small differences of natural environment for the last three species, but this will not be needed until a full silvicultural study is embarked upon.

What then should be done?

Firstly, the four species mentioned, should receive a careful study so as to define natural environment, propagation, growth rate etc. Wood properties should be more clearly outlined, particularly in the last three species. Large-scale trials should be laid down to establish suitable silvicultural methods for commercial timber production from each species.

With the current value of River Banksia high as it is in the veneer trade, this species should prove the most worthwhile for investigation, and the place to start is on those wet sites, problem areas within P. radiata plantations.

****

RESULTS OF BURNS UNDER JARRAH REGENERATION.

by G.B. Peet

In Forest Notes vol. 3 no.1, I voiced the opinion that damage to small jarrah trees from controlled burning could be regulated by the use of fire danger. The suggested measure of fire danger was the ratings shown in the controlled burning guide.

The opinion was supported by results from a burning trial in 6-year-old jarrah regeneration. These results showed some correlation between the amount of crown scorch and the fire danger rating used for the burn.

The trial covered three burns, at three different fire dangers. Each burn held 150 potential crop trees selected for measurement, and these trees had an average height of 10 feet.

Recently these trees were checked for recovery, and the results are quite interesting. Listed below are the fire dangers used for treatment, the number of trees fully scorched by treatment, and the number of trees killed by treatment.

Plot No.	Fire Danger	Number Fully Scorched	Number Killed
1	Purple 0.8	32	15
2	Green 1.2	100	52
3	Green 1.6	112	70

The results encourage my belief that damage can be effectively controlled by the use of the fire danger ratings. Critical differences for area controlled burning have yet to be determined, but it is quite obvious that the transition between Purple and Green is very important to the recovery of 10 feet high jarrah trees.

All trees have some degree of fire tolerance by virtue of a protective bark layer, which is a poor heat conductor. Kill results when fire intensity is such that the cambium is heated beyond about 60°C.

For controlled burning, the acceptable fire intensity for jarrah trees of approximately 10 feet in height will be somewhere below that defined by a fire danger of Purple 0.8.

EXTRACT FROM "FIRE CONTROL NOTES"
FOREST SERVICE, U.S. DEPT. OF
AGRICULTURE, V.15 no.1, JANUARY, 1954.

HOW MUCH DO YOU KNOW ABOUT THE JEEP?

Most jeep accidents are due to a complete misunderstanding of the pecularities of this vehicle. The jeep was designed for a specific purpose - travel over rough terrain. It is used too often in lieu of the sedan type vehicle. How much do you know about the jeep? For instance, do you know:

a. That a jeep has a higher center of gravity than the conventional vehicle?

b. That a jeep is 10 inches narrower than the conventional vehicle?

c. That a jeep has little springing action and that road shock causes the jeep to bounce off the ground?

d. That a combination of "a","b", and "c" tends to make the jeep the easiest car there is to overturn?

e. That the steering mechanism of a jeep is such as to exert a cramping action in turning rather than a smooth turning action, as in the conventional car?

f. That the steering suspension is such as to result in a locking action when the brakes are applied?

g. That a combination of "e" and "f" tends to make a jeep harder to keep going in a straight line and more difficult to steer generally?

h. That "All-Weather" treads on a jeep or any car increase the braking distance on wet road surfaces over 38 percent (as compared to the conventional military non-directional tread type)?

i. That a jeep was designed for a specific purpose: travel over rough terrain; that it was not designed for high speed; therefore, as the speed of this vehicle increases, its roadability decreased, and speeds over 40 m.p.h. are dangerous?

j. That the jeep lacks body protection; and that when it does upset it affords no protection from maiming, crushing injuries to the occupants.

k. That the jeep is so constructed that you do not sit in it as you do in a conventional car, lowering the center of gravity, you sit on it, thus raising the center of gravity; and that any weight over four persons raises the center of gravity to a dangerous high?

l. That a jeep has a 4-wheel-drive hook-up; and that the use of this drive on the straightaway increases the incidence of upset should the jeep run off the road onto loose gravel or sand? -"Fortlights", Mariitime Administration.

****

SAFETY BOLSTERS USED AT GRIMWADE.

by E.A. Jenkins

The sketches show two safety bolsters used at Grimwade.

1. THE FORESTRY & TIMBER BUREAU BOLSTER.

The sketch shows one side of one of a pair of bolsters mounted directly on the longitudinal runners of a 5 ton truck used for carting 15' - 20' long pine logs.

The stanchion is dropped by removing the safety pin on the opposite side of the truck and releasing the lever, thus slackening the rope holding the stanchion vertical and allowing the stanchion to fall.

Mr. Kerruish of the Forestry and Timber Bureau has advised that the Forestry and Timber Bureau have now modified the design to compact the release mechanism.

The bolsters were found very effective in use.

2. CROSS LOAD SAFETY STANCHION.

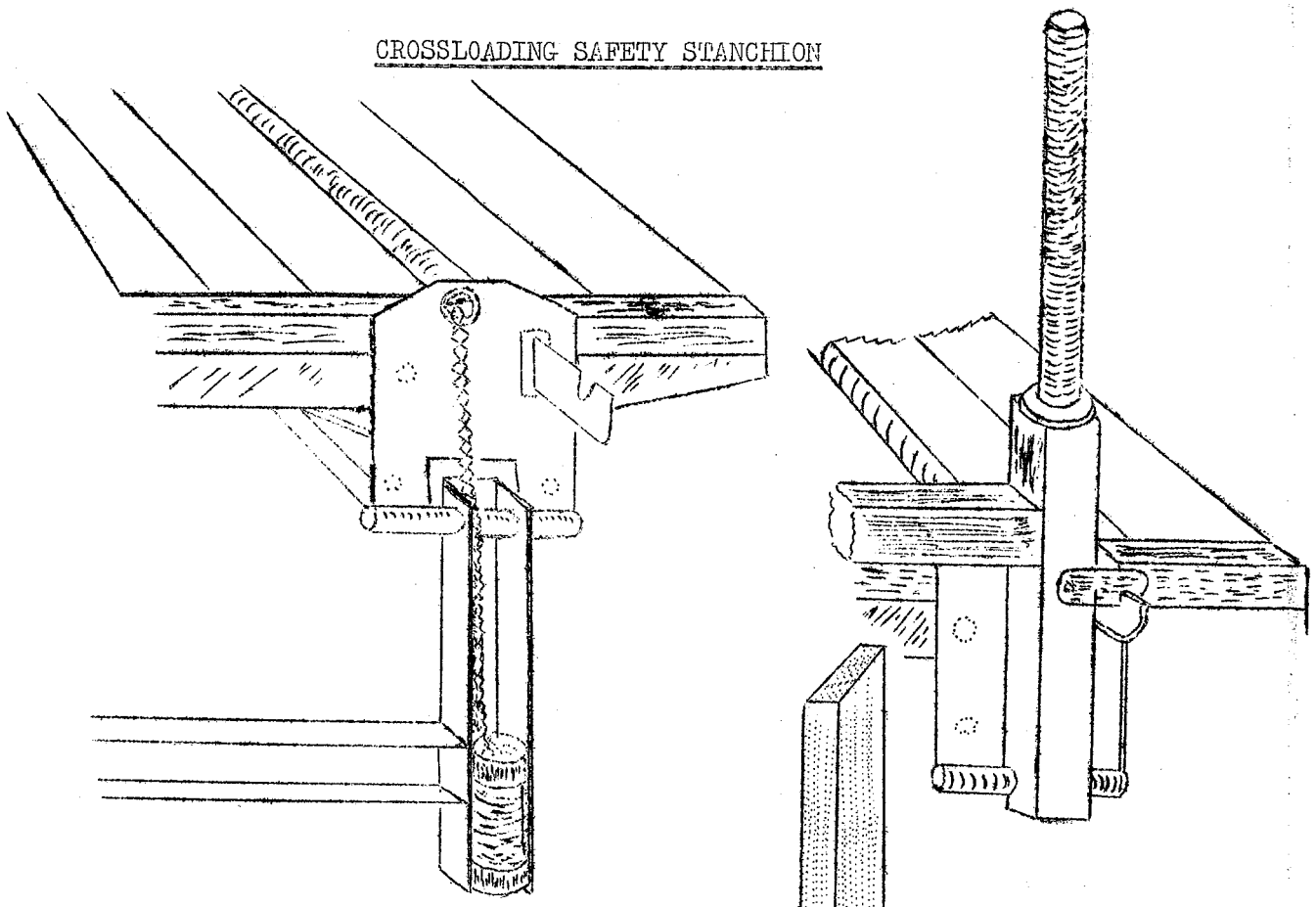
Two two-inch pipes run the length of the truck deck 3' apart. The stanchions swing from a plate bolted to the rear end of the body, and are connected by a horizontal piece of angle iron. The stanchions are held vertical by a chain running through each pipe.

The opposite end of the chain is held in a slotted plate bolted to the front of the truck, and the stanchion is dropped by slackening this chain.

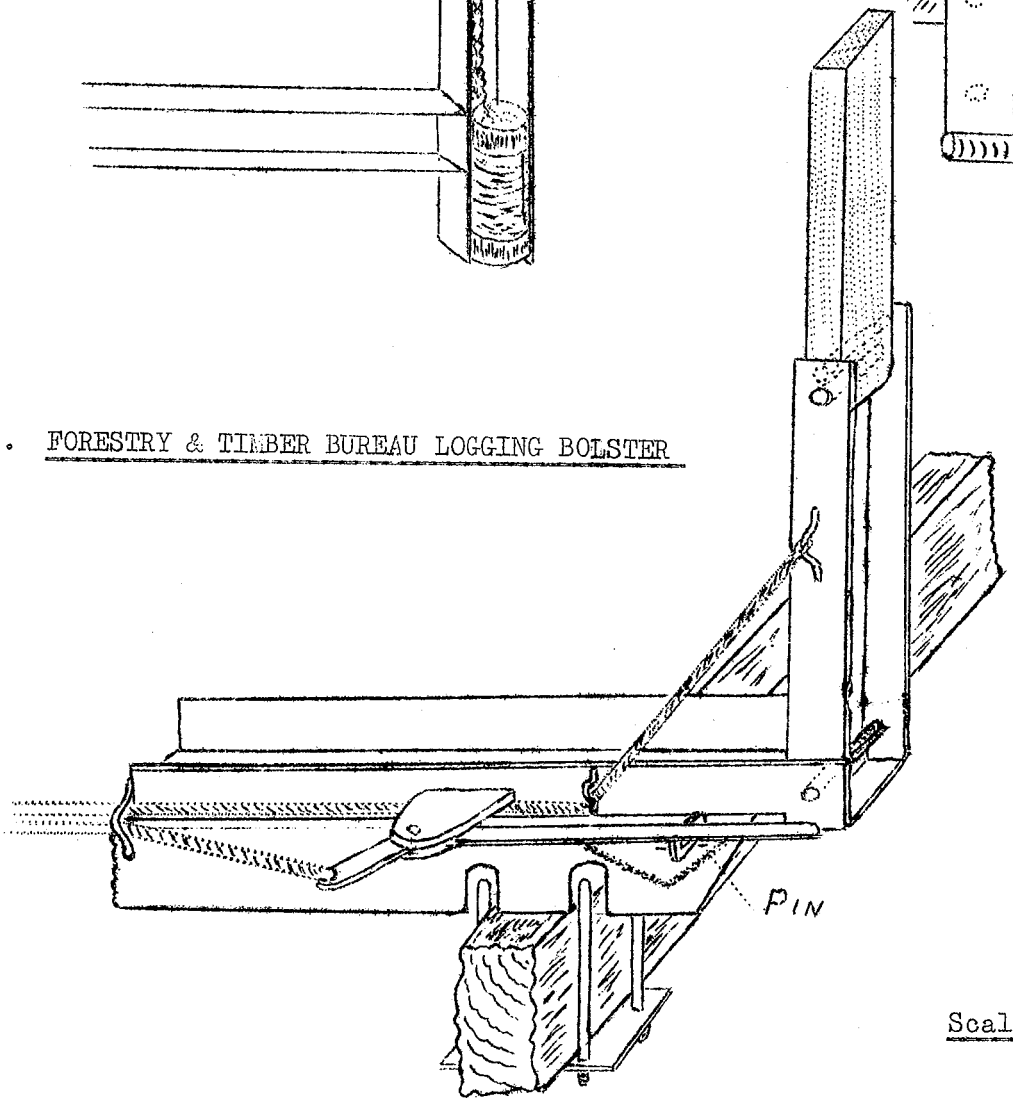
This design has been found satisfactory for carrying 6' and 7' logs in bin loads 3' high.

****

CROSSLOADING SAFETY STANCHION



A. FORESTRY & TIMBER BUREAU LOGGING BOLSTER



Scale 1" = 1'.

RUBBER LINED HOSE

by N. Percival

This is the biggest shot in the arm, fire control has had since broadcast burning in State Forest was introduced.

Nannup, at present is the only centre supplied with this type of hose, and there is an air of confidence in the whole staff that this is the best thing in fire equipment for many years.

Not only is it more efficient, it is easy to handle both in use in the field, and in storing.

Although it cost more initially than canvas hose, it more than compensates in handling costs.

Rubber lined hose is wound double from the centre, 2 wire pins or staples are all that is required to hold the rolled hose firm, this cuts out the metal hose runner as used on canvas hose. They can be rolled up wet to dry as against canvas hose, which once wet has to be rolled into "water melons" until it can be dried.

This is a slow and costly business.

Rubber lined hose gives a more effective nozzle pressure, giving approx. 25% more head than canvas hose.

Also delivers the water faster as there is no seepage as with canvas hose.

At present these hoses are fitted with conventional hose ends, but it is hoped to have South Australian Hermaphrodite coupling next season.

This should simplify and speed up the running of hoses.

For Training Gangs

The rubber lined hose is again well to the fore. Through easy handling and rolling, we can do at least three times the amount of training as against canvas hose. It is faster to run out, without any fear of kinking, which is a major fault in canvas hose.

It can be run out in multiples, providing the ground is not too steep.

At a recent trial, two men working a H/D outfit, connected 3 hoses together and these were run out by one man, while the other connected hose to the pumper and started his motor.

Water was through the nozzel in $1\frac{1}{2}$ minutes, 300 ft. from the truck. This was on level ground.

Advantages

1. Easy handling - maintaining - storing.
2. Increase the water head - water travels faster.
3. Will not kink.
4. Does not require runners.
5. Can be rolled in the field and stored.
   (No hose rack required)

Disadvantages

1. It will burn more readily than canvas hose.

The Hose Winder

We find the local hose winder with a few modifications far superior to the South Australian type.

They are light and easy to handle in the bush.

One must be carried on each vehicle carrying rubber lined hose.

The South Australian type winder, is too heavy and cumbersome, and definitely not suitable for use in the bush.

Let us hope that by next fire season, at least all major pine plantations will be equipped with rubber lined hose.

This will be good insurance for the Forests Dept., and will lift the morale of the firefighters.

****

Heard on VHF early in March, 1965.

Time around 11.45 A.M.

Mobile to Base: Am broken down approx. 6 miles from home ref.....

Base to Mobile: Roger, will get mechanic out to you as soon as possible after lunch.

Mobile to Base: But I haven't got a crib.

Base to Mobile: Try fasting for Lent.

****

BARK REDUCTION BY INTENSE FIRES IN THE JARRAH FOREST

by G.B. Peet and J. McCormick

1. Introduction

"Forest Notes" Vol.3 March 1962, contained articles by Mr. Wallace and Mr. Williamson, discussing girth reduction from burnt bark and shrinkage after intense fires in the jarrah forest. Williamson's results from a growth plot in the Dwellingup fire area showed a mean GBHOB decrement of 2.25" of which he attributed 17% to shrinkage.

Recent work supports Williamson's observation and is tendered as further information on this subject.

The results came from a burning treatment applied during November '64 to dendrometer growth plots in a dense jarrah pole stand. The dendrometers are of the band type, fitted on a smoother bark surface at B.H., and the vernier reads to 0.01".

The treatment was a hot Spring burn, achieved by heaping slash around the base of the trees. During the treatment flames reached 20 to 35 feet in height resulting in badly browned but not defoliated crowns. Six plots were treated, each plot containing 5 dendrometer trees.

Observations of GBHOB decrement were obtained from dendrometer readings before and after each burn, and from a reading two weeks after the burns.

The experimental area is located in a regularly controlled burnt compartment which had been burnt 4 years prior to treatment. The bark on the lower bole was well blackened by this previous burn.

2. Results

(a) G.B.H.O.B. decrement due to burnt bark and shrinkage.

Average GBHOB decrement for five trees in each plot is shown on table 1, and the decrement has been divided into that due to burnt bark and that due to subsequent shrinkage. The table also lists stand details which are pertinent to section C of this article.

Table 1. Plot data from dendrometer plots at Coach Rd. Dwellingup Division.

Plot No.	GBHOB decrement (inches)			Number of Trees per Acre	Basal area per acre (sq.ft.)	Average girth of 5 dend. trees (feet)	Average tree girth in the plot
	From burnt bark 26.11.1964	From bark shrinkage 11.12.1964	Total GBHOB decrement (inches)				
5	1.92	0.54	2.46	569	226	2.7	1.9
8	1.68	0.39	2.07	329	176	3.5	2.3
18	1.43	0.27	1.70	458	222	2.9	2.0
21	2.08	0.15	2.23	374	205	3.0	2.3
22	1.85	0.16	2.01	463	165	3.0	1.9
23	1.48	0.25	1.73	396	156	2.5	1.9
$\bar{x}$	1.74	0.29	2.03	192	192	2.9	2.1

The range of GBHOB decrement expressed by the 30 trees was.

Loss due to burnt bark 0.95" to 2.61".
Loss due to shrinkage 0.07" to 0.70".

Table 1 lists a mean GBHOB decrement of 1.74" for burnt bark, 0.29" for shrinkage, and a mean total of 2.03". These results correlate with those given by Williamson for trees with crowns fully browned by the Dwellingup fire, i.e.:

(i). Dwp. fire plot (Williamson) mean total GBHOB decrement 2.17".

(ii). Dendrometer plots mean total GBHOB decrement 2.03".

(iii). Dwp. fire plot percentage of tctal GBHOB decrement attributed to bark sh shrinkage 17%.

(iv). Dendrometer plot percentage of total GBHOB decrement attributed to bark shrinkage 14%.

(b) Amount of dead bark consumed by an intense fire.

The amount of dead bark consumed by the treatment fires is estimated as follows:-

(i). Bark gauge readings before and after burning indicate that 41% of the bark profile was burnt.

(ii). Live and dead bark components in the bark profile were separated, and their respective depths measured. The results indicate that dead bark comprised 43% of the profile before burning.

It is probable that intense fires remove all the dead bark at least from the lower part of the bole. From observations of bark burning and blackening during the treatment, the region of dead bark removal is considered to lie between ground level and 20 feet up the bole.

Comparing bark thickness in a protected stand before and after the Dwellingup fire led to a similar conclusion. The dead bark contributed 52% to the bark profile before burning, and the fire removed 57% of the profile, indicating that all the dead bark is removed from the lower bole in such a fire.

(c). Dead bark as a fuel quantity factor.

An estimation of the quantity of dead bark consumed per acre by an intense fire, in a dense jarrah pole stand, is given from table 1, i.e.:

(i). Loss in BAOB per tree (i.e. bark loss) = 0.0618 sq.ft.

(ii). Loss in volume OB per tree = 0.0618 x 20 = 1.236 cub.ft.

(iii). Loss in volume OB per acre = 1.236 x 433 = 535.2 cub.ft.

(iv). Density of dead bark has been measured at 10369 or 23 lbs./cub.ft.

(v). Weight of dead bark per acre = 5.45 tons e.g. O.D.W.

The dendrometer trees are larger than the stand average and a fuel quantity correction of 0.72 is introduced, to equate bark weight to the average tree.

(vi). Amount of dead bark burnt per acre = 3.9 tons e.g. O.D.W.

It is pertinent to note that a fuel weight of 3.9 tons per acre represents a five-year-old fuel under a 50% canopy. (McArthur 1962). If the bark ignites an entirely different forest fire will develop than if it doesn't, and burning bark was undoubtably a major cause of severe crown damage in recently burnt areas during the Dwellingup fire.

The moisture content of dead bark shows a pronounced seasonal trend, and is much less inflammable in Spring and early Summer than in late Summer and early Autumn.

The amount of ground litter required to support a fire which will ignite and sustain burning bark is probably quite low under severe fire danger conditions. This was well illustrated by the Dwellingup fire where defoliation occurred in all fuel ages over two-years.

A three-year-old ground litter will not support a defoliating fire in high jarrah forest unless additional fuel is introduced, and a major introduced fuel during periods of severe fire danger is undoubtably dead bark. The quantity of this additional fuel is very high, even in regularly burnt stands, and is greater than the accepted maximum ground litter accumulation permitted under the rotational burning system.

The probability of eliminating defoliating fires from the jarrah forest by a four-year burning rotation is slight, but the chances of minimising the area and controlling the head of these fires must of course be quite good.

Ref. McArthur, A.G. 1962. 'Controlled Burning in Eucalypt Forests'. F. & T.B. Leaflet 80.

****

CHRYSOMELLID ATTACK ON EUCALYPTUS LEHMANNII, HAMEL.

Bald Island Marlock

by A.J. Hart.

It is of interest to record an attack of a common chrysomellid beetle, (Paropses sp.), (to be confirmed), on small trees of Eucalyptus lehmannii at the Hamel forest settlement.

The infestation was first observed on the 23rd. February, 1965. Trees affected range from about 2' - 4' tall and are about 12 months old.

The attack is typical of the leaf eating insects, leaves being eaten around the edges in irregular fashion.

Size of the insects found was about 3/16" x $\frac{1}{4}$" and are typically hemispherical in the elevation view. Colour is a pale yellow with orange tints overlying the background colour.

CONTROL:

Recommended control is 1% D.D.T. solution in repeated dosages if necessary to clean up the infestation (W.A. Agriculture Dept. recommendation).

It has been observed that Blue Cross Dieldrin dust is also rapidly effective against them.

Other occurrences would be of interest if anyone has spotted them, as this is a species of which large quantities are being sold as seedlings particularly in the Esperance area.

****