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FORESTS DEPARTMENT OF WESTERN AUSTRALIA

F O R E S T N O T E S

NUMBER 2 SEPTEMBER - 1960

Contents

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FOREST NOTES

TO THE EDITOR

Dear Sir,

After reading the first edition of Forest Notes I am concerned about its future.

The idea of "a newsletter permitting free exchange of information between field staff" quoting the editorial, is a great step forward and should be pursued to the utmost. However, if the publication becomes primarily a medium for the dissemination of research reports surely it falls short of what was originally planned.

I do not suggest that research workers should be deprived of a medium through which they can bring results of work undertaken to the notice of all the officers in the Department. This is most desirable.

I suggest we need two publications. Forest Notes should be retained and a second publication titled "Technical Notes" or "Research Notes" produced.

Forest Notes would contain short articles and items of general interest. In addition the research worker could prepare a summary of any article or report published in the more detailed Technical Notes.

Technical Notes could be produced quarterly and contain reports and articles from research workers. This publication could have a more restricted circulation than Forest Notes but would be available for all interested.

This suggestion is put forward because I believe Forest Notes will only receive contributions from a small minority if technical reports are included. I doubt if members of the field staff in general will contribute short articles or pass on observations if they are to be sandwiched in between detailed reports of work undertaken by specialist officers.

Yours faithfully,

B. J. BEGGS

EDITORIAL COMMENT ON SCOPE AND PURPOSE OF "FOREST NOTES"

Mr. Beggs' article regarding the contents of Forest Notes is very welcome and it is suggested that other interested officers should comment along these lines.

As stated in the original editorial "the single criterion for inclusion is that an article is of general interest to the field staff". It must be understood that the only people who can decide just what type of material is of general interest are the readers. It is up to you to nominate and provide the standard desired.

A point worth noting, however, is that if technical articles are excluded, there is, to date, insufficient material to put out a worthwhile edition. So far only a half dozen people have indicated their interest in supporting the newsletter. This, it is to be hoped, is rather the result of not knowing what is required, rather than reflecting a lack of enthusiasm.

Whether a separate "Technical Notes" will be compiled is not the immediate problem: it does not concern Forest Notes in the present stage and certainly will not be considered until Forest Notes is firmly established. There is some doubt, however, as to just what is considered to be a technical article.

It is felt that what is required is a reporting on technical material as well as on general material. The point in question is the manner of reporting in the former case. Statements of techniques, results, tables, analyses, etc., are not of general interest and superfluous so long as the object, general approach and conclusions of any technical project are stated. A report summary would be acceptable but the detailed report wouldn't. Is this the position?

Until criticism definitely states that this is the case, it would be appreciated if contributors on the technical side, would keep this in mind. "Boil it down", in the first edition, is probably the answer.

It is requested, however, that readers and potential contributors do not take individual articles (not to their liking) too much to heart. Surely there is sufficient material of interest, other than a particular article, to make this newsletter worthwhile to all readers.

Another point which concerns the future of Forest Notes is whether articles from officers of the general division are acceptable. Once again it is necessary to state that this newsletter is for the Department and the Field Staff in particular. Any officer can contribute as he sees fit. It is usual to refer correspondence addressed to Head Office, to the local Divisional Forest Officer prior to despatch. This practice would markedly reduce any editing that is necessary at this end and verify such data as costs, mileages, place names, policy, etc., which is standard for a particular division.

The serious delay which has occurred in the issuing of this, the second edition of Forest Notes, is regretted and every endeavour will be made to produce an issue twice a year.

COMMENTS ON "JARRAH SEEDLING PLOTS - WILLOWDALE"

by D. H. Perry

I have just read the first issue of Forest Notes with interest and enjoyment. I would like to congratulate those responsible for the conception of the idea and the very effective way in which this idea has been made a reality. I look forward with interest to the next issue.

Mr. van Noort will be interested to know that we have two jarrah seedlings growing near the office at Como, the growth figures for which are:-

No. 1 Height 10' 9"

No. 2 Height 8' 9"

These trees germinated from seed thrown into the garden in the winter of 1956 and are now two years and eight months old, approximately. There is no sign of ligno-tuberous swelling at this stage. The growth these seedlings have made in a favourable environment lends support to Mr. van Noort's conclusion that the very slow growth made under natural conditions could be the result of faulty nutrition.

FIRE WEATHER REVIEW

JARRAH AND KARRI FOREST REGIONS

1958 - 1959

by A. B. Hatch.

Fire weather forecasting for the jarrah forest region commenced on the 27th October, 1958, and continued until the 13th April, 1959, a total of 169 days. Karri forest forecasts commenced on the 19th November and continued until the 13th April (140 days).

JARRAH FOREST REGION

Rainfall

In the jarrah forest region the rainfall was very close to the monthly averages for the four months October to January. In February and April the rainfall was well above average, the February rainfall being due to thunderstorms associated with tropical troughs of low pressure. In association with these thunderstorms 95 and 47 points of rain were recorded on the 8th and 28th February, respectively. The higher than normal April rainfall was due to the early break of season rains experienced throughout the Lower South-West.

March was the driest month of the fire season, with only isolated light showers, giving a total of 18 points of rain for the month.

Temperature

Maximum temperatures were above average for the period November - March, the month of December showing the greatest departure from normal (+5.9°F).

Several periods of extreme temperatures were experienced throughout the summer and fifteen days with temperatures greater than 96°F. were recorded. This number is similar to the previous fire season, (17 days), but much higher than the 1956/57 fire season (7 days).

The highest temperature recorded at Dwellingup during the summer was 103.5°F. on the 11th March, 1959.

Relative Humidity

Air masses throughout the summer were not abnormally dry and the Average Index of Mean Relative Humidity was very close to normal for all months except November and December. In these two months the Index was 9 and 7 per cent lower than normal.

Throughout the fire season 37 days were experienced with a minimum daily relative humidity of less than 25 per cent.

Fire Hazard

The mean fire hazard for the Jarrah forest region was 5.8, which is 0.8 units lower than the previous year.

The monthly distribution of fire hazards is shown in Table (7) and the mean monthly fire hazards are tabulated in Table (8).

There were 32 severe summer and dangerous days recorded throughout the summer and the first dangerous day occurred on the 16th November, 1958.

The most prolonged dangerous fire hazard period occurred from the 18th to 22nd February, 1959, when five consecutive dangerous days were recorded.

The distribution of severe summer and dangerous days over the last five Fire Seasons is as follows:

TABLE 9

Year	No. of Days		
	Severe Summer	Dangerous	Total
1954/55	15	6	21
1955/56	29	11	40
1956/57	16	6	22
1957/58	36	22	58
1958/59	20	12	32

KARRI FOREST REGION

Rainfall

In the karri forest region rainfall was well below average for the period 1st November, 1958, to 31st March, 1959, 4.84" (48 days) being recorded as against the average of 7.15" for the period. The driest month of the summer was February, when only 31 points of rain were recorded.

Temperature

Maximum temperatures were lower in the region throughout the summer, only 5 days greater than 96°F. being recorded, as against 9 days for the previous year.

Several isolated days of high temperature occurred throughout the summer, but there was only one period of four days, the 18th - 22nd February, where heat wave conditions occurred. During these four days the lowest maximum temperature was 96°F.

The highest temperature recorded at Pemberton during the summer was 100°F. and this occurred on 19th and 21st February, 1959.

Relative Humidity

On 16 days relative humidities of 25 per cent of less were recorded. It is of interest to compare these figures with Dwellingup, where during the period, 37 days of less than 25 per cent F.H. were recorded.

Fire Hazard

The mean fire hazard for the karri forest region was 4.5, which is 0.4 units lower than the 1957/58 mean.

There were 3 severe summer and 4 dangerous days recorded compared with 4 severe and 2 dangerous days for the previous year.

The first dangerous day in the karri occurred on the 18th February, 1959, but a hazard of 9.0 was recorded on the 8th January.

Prolonged heat wave conditions occurred from the 18th - 21st February, when four consecutive dangerous days were recorded.

The monthly distribution of karri fire hazards and the mean monthly hazards are shown in Tables 13 and 14, respectively.

TABLE 7

Jarrah Forest Region

Fire Hazard Distribution

1956 - 1959

First Hazard	Month							Total
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	
Nil	2	9	3	2	2	-	3	21
Low	2	5	1	1	1	4	4	18
Mod.	1	5	3	7	5	13	4	38
Aver. S.		3	5	6	7	9	1	31
High S.		2	14	5	5	3		29
Severe S.		4	5	6	3	1	1	20
Dang.		2		4	5	1		12
	5	30	31	31	28	31	13	169

TABLE 8

Dwellingup

Mean Fire Hazard

October 1958 - April 1959

Month	No. of Days	Mean Fire Hazard
October	5	2.6
November	30	4.3
December	31	6.6
January	31	6.7
February	28	6.8
March	31	5.9
April	13	3.7
Year	169	5.8

TABLE 13

Karri Forest Region

Fire Hazard Distribution

1958 - 1959

Fire Hazard	Month						Total
	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	
Nil	2	2	3	2	5	7	21
Low.	3	5	5	8	7	3	31
Moderate	5	16	8	5	8	2	44
Aver. S.	1	7	11	5	9	-	33
High S.	1	1	2	3	2	1	10
Severe. S.			2	1			3
Dang.				4			4
	12	31	31	28	31	13	146

TABLE 14

Mean Fire Hazard

1958 - 1959

Month	No. of Days	Mean Fire Hazard
November	12	3.3
December	31	4.8
January	31	5.1
February	28	5.3
March	31	4.3
April	13	2.1
Year	146	4.5

THE JARRAH LEAF MINER

by D. R. Moore

All officers will, I think, have noted the serious defoliation that takes place at times in the jarrahs along the coastal strip and also the flooded gum (Euc. rudis) in various parts.

Possibly officers are not generally aware that this defoliation is due principally to the larvae of a moth Tinea Sp. According to a leaflet from the Department of Agriculture of Western Australia, which was prepared by L. J. Newman F.E.S. and J. Clark F.L.S., this insect has been observed to attack Tuart (Euc. Gomphocephala), gimlet (Euc. salubris), Boongul (Euc. transcontinentalis) in addition to the two aforementioned species.

Attacks of this pest have been noted from as long ago as 1914 but a severe attack in 1920 in the King's Park, Perth, and Claremont area attracted considerable attention.

Distribution

The distribution of this pest based on reports received up to about 1925 is as follows. Outbreaks were mostly confined to the jarrah growing on the coastal strip and it was noted that they occurred mainly in proximity to the ports of Fremantle, Albany, Bunbury and Busselton. From these centres it has spread inland in all directions but appears to stop at the foothills.

From Albany it has travelled some miles up the Kalgan and King River areas and westward as far as Torbay. Between Torbay and westward to Busselton the country is free from this moth. With the exception of some of the land in the Albany area which is ironstone and granite, the area infested is of a sandy nature. Up to that time there was no evidence of any penetration of the insect into the prime jarrah belt, but mild outbreaks were noted at Merredin and Westonia in gimlet and Boongul.

More recently from my own observations during 1957 and 1958 I have noted quite severe attacks in country east of Boyup Brook mostly in the flooded gum (Euc. rudis) along the gullies but also amongst some of the adjoining jarrah.

Forester Kelly has reported attacks on jarrah in the country just west of Kirup.

Method of Attack

The moth responsible has proved to be an unnamed and unrecorded species belonging to the Microlepidoptera of the Genus Tinea. It lays its eggs under the leaf surface and after hatching in May the larvae feed within the leaf until September. When the larvae reach maturity they drop to the ground and bury themselves in the soil where they pupate.

The moths are single brooded otherwise the attacks would have more serious effects.

Effect on the Attacked Tree

The larvae eats away the internal substance of the leaves which die in whole or part depending on the intensity of the attack. By September or October the leaves are brown and give the effect of having been scorched by fire. It was earlier considered that the attacks would not have a very serious affect on the vitality of the trees, but later observation has shown

that repeated attacks will seriously weaken and will eventually result in the death of the trees. The swamp gum (Euc. rudis) seems to suffer more than the jarrah and no doubt many officers will have observed the drastic effect on this species along roads in the Dardanup - Bunbury area where many trees have succumbed and the species would appear to be doomed to final extinction.

Control

The prospects of controlling the attacks of this insect are not promising owing to the method of feeding employed by it. As the larvae feeds within the leaf surface it cannot be dealt with by the ordinary contact or poison sprays but an effective systemic spray may eventually be discovered.

However, it seems doubtful whether it would be economical to treat extensive areas, even if this type of spray proved effective. Up to 1925 the entomologists attached to the Department of Agriculture had failed to breed out or locate any effective internal or predacious parasite but probably this subject has not been pursued very diligently in the interim.

It has been suggested that ground fires, by destroying the hibernating larvae, have been responsible for checking the spread of this pest into the main jarrah belt.

If this were so it would surely provide another very strong argument in favour of the controlled burning of the forest.

In view of the possible very serious effect on our forest, officers are urged to observe any outbreaks of this pest and to forward details of the extent of such attack to Mr. Perry at 121 Todd Avenue, Como.

SOME NOTES ON THE COASTAL SAND DUNES BETWEEN POINT D'ENTRECASTEAUX AND PERTH

by D. H. Perry

I was recently given the opportunity to inspect the sand dune stablisation work which has been carried out over the years along our coastline from Point D'Entrecasteaux to Perth. The major part of this section of our coastline is very unstable and any interference with the vegetation which holds the soil in place can have disastrous and far reaching effects. The main points at which reclamation work has been carried out commencing at Point D'Entrecasteaux are:-

1. The Calcup Dunes just south of the Warren River.
2. The Yeagerup Dunes which lie between the Warren and the Donnelly Rivers.
3. The Boranup Dunes just north of Karridale.

4. A number of areas between Boranup and Cape Naturaliste as follows commencing at the southern end:

Calgardup
Boodjidup
Gnarabup
Kilcarnup
Gnoccardup
Elensbrook
Quinninup
Imjidup

5. Bunbury - north of the Power Station.

6. Several areas between Bunbury and Mandurah.

7. Point Peron, Penguin Island, Cottesloe, Swanbourne

Some of the larger areas of drift sand, for instance Yeagerup and Boranup, were undoubtedly on the move before the white man came to this country. Our interference with the environment has accelerated the movement of existing dunes and created many new ones.

Boranup Dunes

The first actual sand dune fixation work carried out in Western Australia was at Boranup, by the M. C. Davies Timber Company, in the early 1890's. This firm had been trading with South Africa for a number of years and it is known that Marram Grass had been established there to stablise draft sands in the early days of settlement. It is highly probable that either seed or cuttings was obtained from this source and established on the Boranup Dunes. This huge area of shifting sand continually menaced the main access road from the Company's Mills to the north and the road was resited eastwards several times. Finally it could not be moved further east as a line of swamps prevented this and the only thing to do was to stop the advancing sand. It is not known just how much of these dunes was planted up but their further advance was completely checked. An examination of these dunes today, some 65 years later, shows that Marram Grass is still growing vigorously in many places where there continues to be sand movement. There still exists large areas of drift sand within the dune complex, but these are fairly well controlled by the marram grass which becomes vigorous on the perimeter of such areas as a direct result of the sand movement. Indigenous vegetation has re-established itself over a considerable area around the southern, eastern and northern perimeter of the dune where the sand has been stabilised by the Marram, but this does not exceed ten chains in width after 60 years. There are also extensive areas within the dune complex where the native vegetation has become established again and it appears that this spread has developed around isolated areas of indigenous vegetation not overwhelmed by the advancing sand initially. The dead Marram Grass can be found in what are now very dense thickets of mainly Acacia cuneata - but other plants are also present - Dryandra sp., Scaevola sp., Agonis flexuosa, Acacia cyclopis, etc. Acacia cuneata in particular and Acacia cyclopis to a lesser extent are outstanding plants in this region for revegetating the dunes once drift has been arrested. The windward side of this dune extends to the coast and much of this area is still bare. The sand has been removed from over the limestone and there is little chance of vegetation re-establishing itself on these areas. However, Marram Grass is to be found in isolated spots whenever there is enough sand for it to become established.

Calcup Dunes

One of the most encouraging and really outstanding developments has taken place on the coastline between the Donnelly and the Meerup Rivers. The Calcup Dunes on the south side of the Warren River were beginning to obstruct the flow of the river in 1934. In 1936 the whole area of this dune (approximately 1,000 acres) was planted with Marram Grass with the object of fixing it and preventing further drift. The major part of the grass for this work was obtained from small plantings carried out by landholders some years earlier. This operation was entirely successful and no further drift took place. While engaged on this work in 1936, I took the opportunity to examine the coast line for some miles north and south of the Warren River. At that time the beach which in this vicinity is about half a mile wide from the base of the foredune to H.W.M. was devoid of plant life except for a few scattered Arctocthecus sp. Today, some 23 years later, Marram Grass has spread through the intervening belt of sand hills from Calcup to the H.W.M., a distance of approximately one and a half miles and north and south along the coast for a total distance of approximately 15 miles. It is now growing south of the Meerup River and will undoubtedly establish itself on the large dunes near the Meerup in the not too distant future. The fact that this sand stilling plant is spreading naturally and so rapidly over this country is of great economic importance and it would appear at this stage that very large areas of sand dune will become stabilised by it in the next 30 to 50 years. This process could be hastened by the judicious spreading of Marram Grass by planting.

It is particularly noteworthy that Marram Grass seeds profusely in this region, something it does not do northwards of a point somewhere between Perth and Bunbury. It is to this characteristic that the amazing spread of this plant can be attributed. It is possible that this faculty for seeding freely may be due to environment or it could be due to the development of a free seeding strain. This is now being investigated by the Soil Conservation Service, who have taken over responsibility for this important work.

There have been many examples of the rapid natural spread of worthless plants in Australia and to encounter the reverse in an example such as this is most encouraging.

Ellensbrook

Another instance of the outstanding value of Marram Grass as a sand fixer is to be seen at the old Bussell property at Ellensbrook. The homestead was surrounded with large areas of drifting sand and was deserted in 1938. Following the planting of Marram Grass in that year the whole area has been stabilised and the indigenous vegetation has now re-established itself over the whole area. The old homestead has been renovated and repaired and is again occupied.

Another plant which has played a part in the stabilisation of this particular area is Pyp Grass (Ehrhata villosa). This species now appears to be spreading amongst the indigenous scrub and competing with it for growing space.

PERPETUAL YIELD (HARD BOILED)

by G. W. Nunn

We often hear from Foresters - "This mill will be cut out in 10 years or so and they need more country ! !"

How many of us have given regurgitation and faith to the bedtime stories about management planning and improved yields which we imbibed during our adolescent training?

Let us look over this one.

Mill A, which has been cutting for 19 years, will "Cut out" in 10 years, i.e. first cycle of cutting and having been rather fussy about log quality.

The facts as management officers see them are -

Form 420 (c) (Abbreviated and not yet published)

(1) Area of permit - 57,000 acres.

(2) Gross loadage over 60", including marri, 1,809,000 loads

Marri over 60"	615,000
Non marketable jarrah	107,000
Total non marketable :	722,000

(3) Total marketable over 60" G.B.H.-1,100,000 loads.

(4) Permissible cut - 21,600 loads per annum.

(5) Remaining life without considering growth -

(a) On jarrah @ 21,600 per year = 50 years

(b) Including 50% of total marri after say 30 years on jarrah = 63 years

(6) Remaining life considering growth -

(a) Allowing 1% M.A.I. on over 60" trees for 32 years (simple int.) = 83 years

(b) Allowing 2% M.A.I. for 41 years on 36" to 60" G.B.H. trees - 292,000 loads (Simple int.) = 96 years

i.e. Total life in sight without using trees at present below 36" G.B.H.

(7) Information

(a) Average percentage of total over 60" volume at present being removed under tree marking = 47%

(b) Estimated life for first cycle = 10 years

This is by no means an unusual case and similar figures can be seen for many of the large mills with permit areas of more than 50,000 acres.

If we consult the nearest working plans office for facts

and subscribe facts and ideas, better working plans can be made in future.

A disservice to forestry, rather than a service, may easily result from having an unduly long first cutting cycle, or in other words, by having large areas of virgin forest unworked.

HAVE SOIL, NO GRAVEL

by P. N. Hewett

This year's remeasurement of two pine plots in Greystones Compartment 3, Mundaring, has produced a new set of Mean Annual Increment and Current Annual Increment figures.

The plots must be the oldest established in Pinus radiata in this State, since trees are now 37 years of age and plots were established at 7 years and remeasured at fairly regular intervals thereafter.

The Site

Plots are on an old vineyard area which had several years of cultivation before plantation establishment. Plot No. 5, site quality I, is on a deep, moist basic soil - Byfield's loam, while Plot No. 3, site quality IV, is on a shallow phase - Byfield's loam with light gravel overlays.

Measurements

Plot No. 5 : Figures in April, 1959, indicate that both M.A.I. and C.A.I. have passed their peak and C.A.I. is rapidly decreasing.

M.A.I. 463 cub. ft. volume removed 9209 cub. ft. per acre

C.A.I. 397 cub. ft. volume remaining 9742 cub. ft. per acre

Total volume produced - 18,951 cub. ft.

No. of stems remaining - 64 per acre

Plot No. 3 : 1959 measurement also shows M.A.I. and C.A.I. decreasing, but at a slower rate than for site quality I (Plot No. 5).

M.A.I. 369 cub. ft. volume removed 6024 cub. ft. per acre

C.A.I. 247 cub. ft. volume remaining 7620 cub. ft. per acre

Total volume produced - 13,644 cub. ft.

No. of stems remaining - 80 per acre

Increment Curves

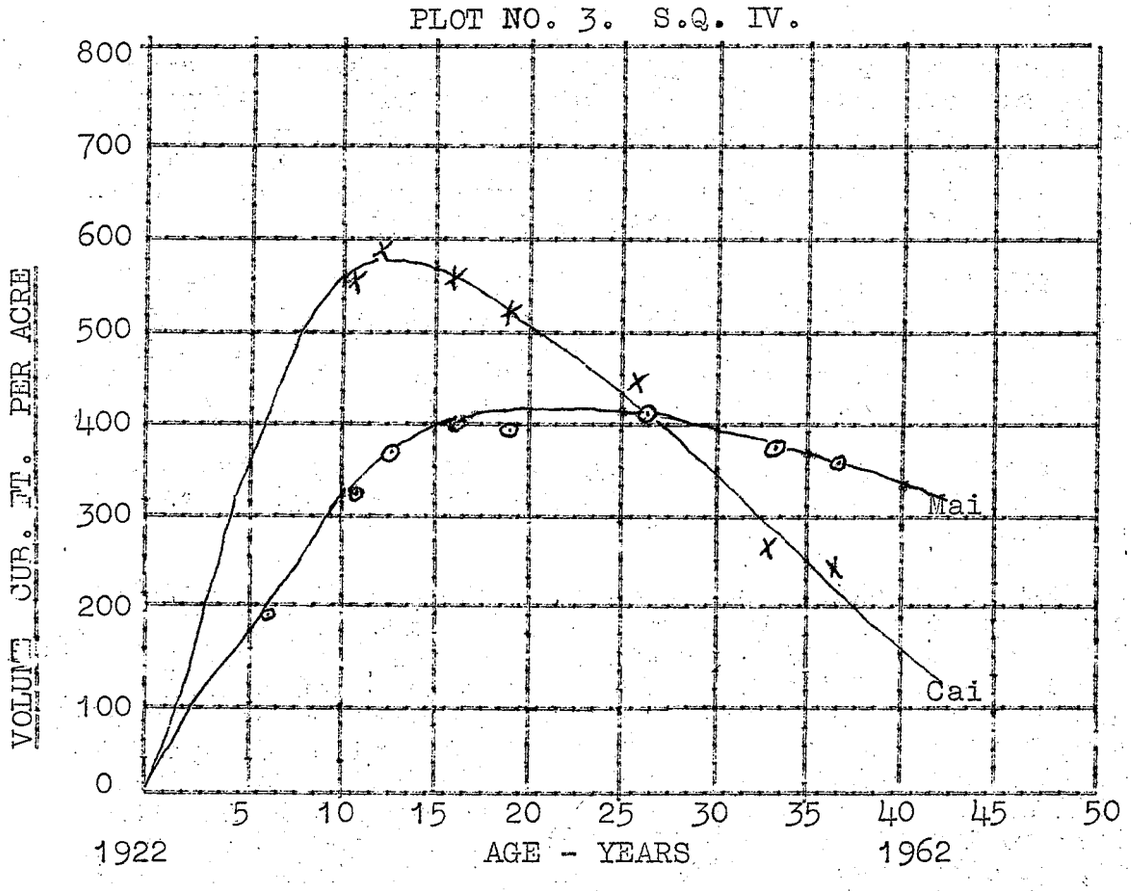
Graphs were prepared plotting age against C.A.I. and M.A.I. for each plot and the resultant curves conform very closely to the test book concept of increment curves. This is shown markedly in the case of site quality IV suggesting perhaps that

site quality IV has normal growth relationships, while site quality I may be considered as extra-ordinary.

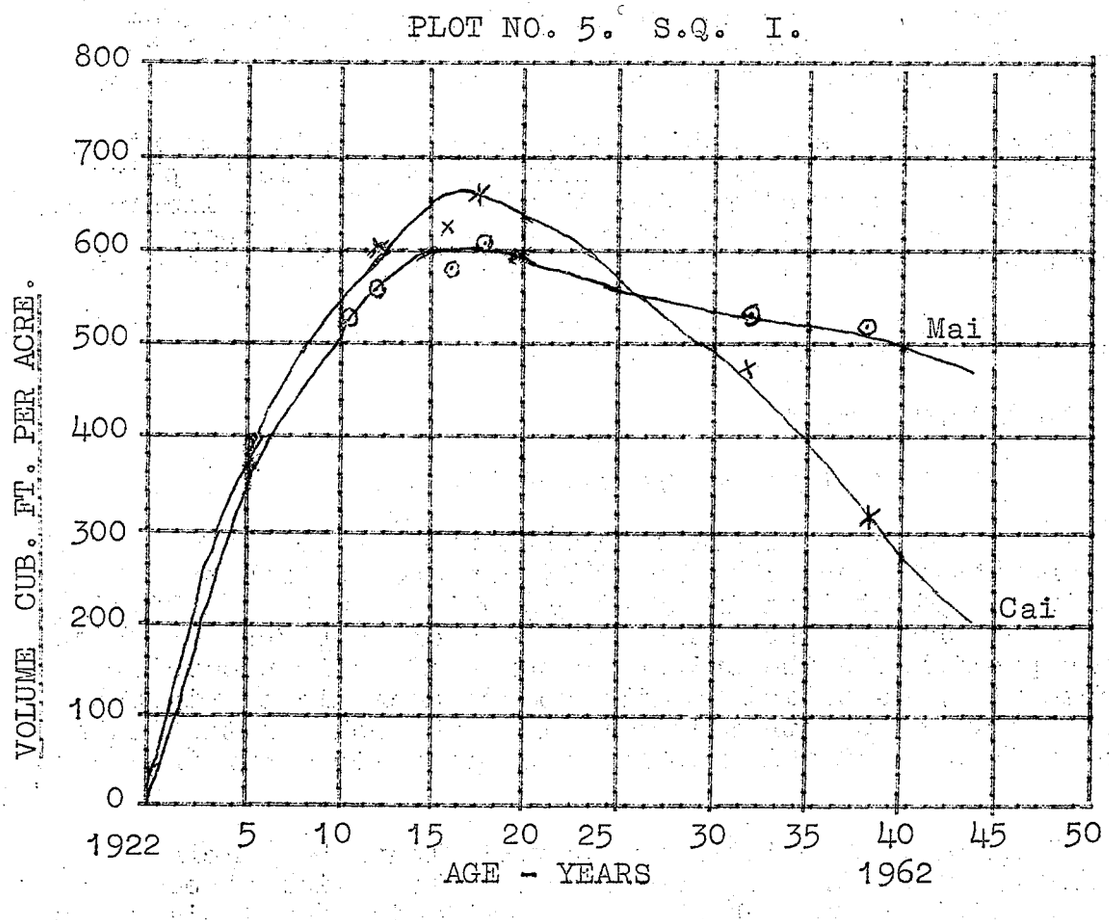
Theoretical Rotation Age

It will be seen from the graphs that M.A.I. and C.A.I. curves intersect at 26 years for site quality I and 30 years for site quality IV. This would again suggest normal development in the lower site quality and supra-normal development in site quality I.

PLOT NO. 3. S.Q. IV.



PLOT NO. 5. S.Q. I.



MECHANICAL PLANT LIFE AND MAINTENANCE

by F. W. Sanders

Modern mechanical plant operation requires the "KNOW HOW" attitude by all connected with it. This knowledge or "KNOW HOW" can mean the success or failure of a project and of the plant involved. A tool in the hands of an amateur cannot be fully utilised unless its capacity and utilisation under various conditions is appreciated and operative skill applied.

With the many problems resulting from the influx of modern plant and equipment into the Department over the last few years, proper work selection, supervision, operation and maintenance are of major importance. The "KNOW HOW" attitude to these factors, therefore, becomes vital to plant life and maintenance.

It is essential to be fully conversant with the capabilities of the new equipment and the conditions under which it has to be applied.

Most specialised plant such as earth moving equipment, power saws (especially chain saws), 4 x 4 vehicles, fire pumpers etc. require up to date instruction of the operator before commencement of operations. Often it is not only a question of being conversant with the maintenance and normal operation of a certain plant item, but to know from the start the technique of specialised operation for which the machine was designed. The makers instruction book usually gives a good lead, but often with more specialised equipment demonstrations by skilled operators are essential, as otherwise "teething troubles" and misuse will cut down the normal plant life to a minimum, often with results that lead to the wrong conclusions in regard to the usefulness and commercial value of the plant.

The specialised nature of forestry work to which certain machinery has to be adapted, makes a hard and fast rule very often impossible, but the usage of certain types of earth moving equipment such as graders, front end loaders etc. under tough conditions without the preliminary use of a bulldozer to achieve suitable work conditions, tends to keep maintenance costs high.

Great advances in design of modern mechanical plant have been made and with it more specialised and intricate plant components. Most makers claim that plant life has been increased, but to reap the benefit of the extended lease of life "work selection" becomes a must, to get the best out of the equipment.

Maintenance today is of a more specialised nature and falls mainly into two categories:-

1. Operator's maintenance.

2. Workshop maintenance (by specialised tradesmen)

The first can only be satisfactorily assured if checked by the second who in turn must be fully conversant with the particular machine or plant item in question, which can be relatively easily achieved through the medium of the "Workshop Manual" which most makers publish for the uniform repairs of their products. It becomes absolutely essential for the modern mechanic serviceman to be fully conversant with this Manual as the rule of the thumb cannot possibly be used today due to the specialised and intricate designs.

Field or bush maintenance should always be checked periodically by mechanical personnel and a close liaison between operator and maintenance mechanic pays dividends at all times, as it leads to longer plant life.

Another important item is preventive maintenance. All modern plant requires periodic maintenance as recommended by the makers to keep performances up and to ensure uniformity of wear. Often it becomes necessary to have this maintenance done at shorter intervals where plant works under abnormal conditions.

In conclusion it can be said that the main factors ensuring maximum plant life are -

1. Plant potential to be well assessed by Officer-in-Charge.
2. Operator fully conversant with the handling and maintenance of plant.
3. Good work selection for plant.
4. Co-ordinated maintenance by operator and workshop personnel.

CAN YOU BEAT THIS ONE?

by P. N. Hewett

It is well known generally in the Department that Mundaring has, in its Greystones Compartment 3, one of the finest stands of Pinus radiata in Australia.

Perhaps less well known is the existence of some extremely fine stands of Pinus pinaster. Recently I climbed and measured a tree in Darkin, Compartment 5, approximately 10 miles South-East from Mundaring Weir headquarters.

This tree is the tallest Pinus pinaster we have measured locally, so far, but we think there may be even better ones elsewhere in the Division.

Here are the details:-

Darkin Compartment 5 : Original spacing 8' x 8' - 2 year old stock

Age at Feb., 1959 - 25 years DBHOB - 14.5 ins.
Height to 4" DUB - 84 feet Height to tip - 96 feet

Height	DOB	BAOB	Vol 10' Log
5'	14.2	1.09950	10.995
15'	13.0	.92172	9.217
25'	11.4	.71320	7.132
35'	10.2	.56745	5.675
45'	9.8	.52382	5.238
55'	8.8	.42337	4.234
65'	6.8	.25220	2.522
75'	5.2	.14755	1.476
Odd 4' log	4.3		.4034
TOTAL VOLUME OVERBARK TO 4" CROWN :			46.89 cubic feet

Has anybody measured a taller specimen of Pinus pinaster?

KARRI TREE - DONNELLY MILL

by A. C. Harris

G.B.H.	=	16' 6"
Basal Area	=	21.6649
Merchantable Bole	=	166 feet
Form Factor	=	0.6
Volume	=	B.A. x Log Length x F.F.
		21.6649 x 166 x 0.6
		2157.8 cub. feet
		43.2 loads
Clean Bole Length	=	141 feet
Volume	=	B.A. x Log Length x F.F.
		21.6649 x 141 x 0.6
		1832.9 cub. feet
		36.7 loads

BIG TREES

by E. R. Hopkins

The details of a large Karri tree submitted by Mr. Harris prompted a search of departmental files for records of other large trees. The following measurements of a number of trees are of interest.

Species	Total Height	G.B.H.	Bole Length	Log Rec'd	Vol. Cu. Ft.	Remarks
Karri	281	24' 6"	131	125		
"	278					Measured 1920
"	270	31' 4"	165		7730	" 1958
"	265	33'	113	100	5716	Felled - 1926
"	251		186	162	2222	Felled - 1953
"	203	32' 1"	85	82'6"		Measured 1943
"		31'	125		2900	
Jarrah	185	21' 3½"		94		Measured 1947
"	139		67	52	1669	Felled - 1957
Blackbutt	150	22' 6"	99	76	1280	Felled - 1951
						Girth at 3 ft. U.B.
Marri	159	25'10"	80		3200	Measured 1945
"		35'				
Salmon Gum	94	12'				" 1952
" "	90					
" "	60	10'10"				" 1951
Xmas Tree	60	9'10"				" 1949
P. radiata	108	3' 8½"			50	" 1948
" "	91	5' 8"			74	" 1948 (edge tree)

There is a constant challenge to Foresters to locate and accurately measure large specimens of tree species. It is suggested that the tallest Marri and Blackbutt figures could be exceeded by trees still standing and there are Pinus radiata trees at Greystones for instance taller than 108 feet.