MR. WALLACE

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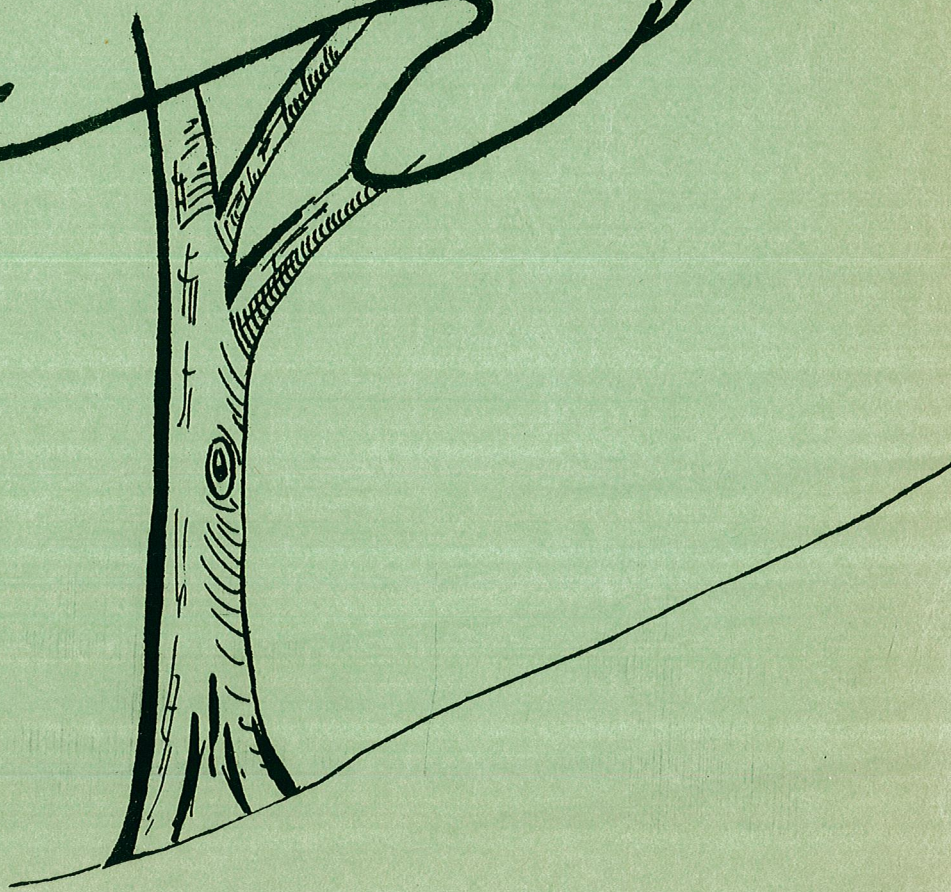
# FOREST NOTES



FORESTS DEPARTMENT
PERTH
WESTERN AUSTRALIA

VOLUME 6 NUMBER 4

# FOREST NOTES

Volume 6 - Number 4

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Editor : R. J. Underwood

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# EDITORIAL

This edition of Forest Notes contains as an experiment a new section entitled 'Regional Notes." The intention is to provide a medium for the communication through the department of brief notes and news items which are of general interest but which do not warrant a full scale article. The regional notes will report such items as staff changes and promotions, technical innovations and divisional research projects, comments on new or unusual equipment and job safety hints etc. By publishing a regular feature of this nature, Forest Notes will be more closely fulfilling one of the ideals of its original conception.

The regional notes in this issue were prepared by the inspectors in the Metropolitan, Busselton and Southern regions. If you have a brief note or news item you would like to see included in the next issue, forward it to your inspector by December 16th.

Reflecting on the original concept of Forest Notes brings to mind the fact that our departmental newsletter has now been in more-or-less regular production for a period of almost ten years. Issue Number One appeared in February, 1959. During this period many ideas and proposals, results of field trials of various sorts and general comments on matters relevant to forestry in W. A. have appeared between our covers. This information is generally inaccessible, since an index to Forest notes has never been made. To overcome this deficiency, work has now commenced on an Index to Material published in Forest Notes, 1959-1969. The index should appear early next year.

## LETTER TO THE EDITOR

Dear Sir,

May I refer to the article "Banksia Can be Killed Cheaply with 245-T" in the last issue of Forest Notes (Volume 6, Number 3, June 1968).

Although no experiments have been laid down or tests carried out, local opinion in this neck of the woods declares the most effective method of eradicating Banksia grandis is innoculation of ridge tops with Phytophthora cinnamomi.

This method -

Requires no spot spraying,

requires no notching,

is very cheap,

very nasty,

(very facetious).

Yours etc.,

"Silent Spring"
(Nannup).

# SCREENING FOR RESISTANCE TO Phytophthora cinnamomi ROOT ROT.

by F. Batini.

## Summary

Phytophthora cinnamomi is catholic in its ability to cause root rot in woody hosts and it appears that few tree species will be immune to infection by this pathogen. However, a number of species are able to survive in field situations where mortality of susceptible species has occurred.

There are indications that trees are most susceptible to root rot in both the seedling and mature phases of development. Screening trials using seedling material are therefore considered to be justified.

Various techniques have been developed for the screening of candidate species. These techniques are briefly described and some of the advantages and disadvantages of each are discussed.

## Introduction

Phytophthora cinnamomi Rands predominantly causes root and collar rots in woody hosts, trees and shrubs. This pathogen has an extensive host range which includes both indigenous and exotic forest trees of commercial importance. P. cinnamomi root rot of Jarrah (E. marginata), is a disease of economic importance to Western Australia and it appears that the pathogen is widely distributed in the Eastern States.

There is need to test for the resistance of various tree species to P. cinnamomi root rot since this pathogen can adversely affect the production, protection and recreational values of susceptible forest communities. The various techniques used will be discussed under these headings:-

A. Nutrient culture trials
B. Pot trials, and
C. Field trials.

## A. Nutrient culture trials

Test seedlings are usually germinated in sand and are then transferred to aerated nutrient solution. When an adequate number of new roots have developed, the plants are inoculated with either:-

a. a suspension of motile zoospores
b. infected material bearing sporangia
c. pure cultures growing on agar, or
d. naturally infected soils.

Under these conditions, infection progresses rapidly and the final disease rating may be assessed within two weeks of inoculation. Control of a variety of factors is possible and this allows for reproducibility of results and rapidity of testing. As the root systems are visible, the progress of infection and the host reaction are readily observed.

This is a very severe test and could result in the rejection of candidates which are field resistant to the disease. Zentmyer has tested over 20,000 seedlings and cuttings of avocado (Persea sp.) with this technique, and considers that all plants with less than 80 percent root rot should be retained for further testing (Zentmyer and Mircetich, 1965). As these trials are carried out under highly artificial conditions, the results obtained require critical evaluation.

However, the technique is suitable for -

1. an initial screening of a large quantity of plant materials, and
2. detailed work requiring periodic root examination.

B. Pot Trials

Among the more common types of inoculum used are:-

a. pure cultures growing on agar
b. suspensions of motile zoospores
c. field soil from diseased areas
d. infected grain or other media
e. dipping the roots in spore or mycelial suspensions prior to potting.

Though still an artificial system, pot trials more closely resemble the natural field situation and provide for a less severe screening test. The effects of various soil factors, e.g. texture, fertility and microflora on the host x pathogen interaction can be investigated. Larger plants can be used and the trials can be maintained over a longer period.

However, the root systems are not readily observable, the activity of the pathogen cannot be readily assessed and the response to inoculation is generally less rapid. A useful screening of candidate species and environmental factors is possible, as a precursor to the evaluation of a reduced number of critical factors in field experiments.

C. Field Trials

a. Screening Trials

Preferably these should be established on sites where P. cinnamomi is currently active. If required, the level of inoculum may be increased by artificial inoculation of the site, inoculation of the test seedlings prior to planting or by pre-planting the site with a susceptible host such as Banksia sp. or New Zealand blue lupin.

Close spacing is preferable so as to concentrate the amount of host root material. In small trials, controls may be established so as to separate the effects of other environmental factors from the effects of P. cinnamomi. In larger trials, controls are of more limited value due to the likelihood of chance contamination.

These trials are a useful tool, particularly if they are supported by investigations in nutrient cultures and pots. The development of P. cinnamomi root rot may vary considerably after planting depending on the distribution and level of inoculum, the site and the season. Adequate replications in space and in time will be necessary.

b. Trials under Operational Conditions

These are established primarily by Dividional Forest Officers engaged in the reforestation of "dieback" areas. To date, a variety of species, sites, establishment techniques and fertiliser amendments have been used. These plots are normally planted at wide spacing on "graveyard" sites where the level of inoculum is reduced. These are considered to be longer term trials, but some have already provided valuable information.

c. Artificial Inoculation of Native or Exotic Stands

This technique will be used in Western Australia to test the field resistance of karri (E. diversicolor) and jarrah stands on selected sites. Investigations on the effects of soil type, aspect, slope and silvicultural treatment on the rate of spread, and the rate of intensification of the disease are planned. The possibility of artificial inoculation of established arboreta and isolated plots of exotices has also been considered. This may be a useful approach in the Eastern States if suitable areas are available where the likelihood of inadvertent contamination of commercial forests is minimised. These areas need not be large and the possibility of ditching, fencing and eventual fumigation of the site should be considered.

Discussions and Conclusions

Most of the eucalypt and pine species tested to date are hosts of P. cinnamomi and there is only circumstantial evidence that any forest trees are immune to this pathogen. However, a number of hosts are able to grow in field situations where mortality of susceptible species has occurred. It appears that tree species are most susceptible to P. cinnamomi root rot in the seedling and mature phases of development (Newhook, 1959; Copeland, 1952). The correlation between tests in nutrient cultures, pot and field trials, has generally been good (Zentmyer et al, 1962; Podger, unpublished). Initial screening trials using seedling material and therefore considered to be justified.

The basic problem in all trials is to predict accurately the ultimate field performance of a candidate species. It is suggested that best practical approach is to compare the relative performance of the test candidate to the

performance of indigenous species whose field resistance to the disease has been documented.

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# HIGH PRUNING TO 30' IN PINUS RADIATA

by K. Kelers.

A test was carried out in Nannup in June 1966 to determine a satisfactory method of pruning Pinus radiata from 15 to 30 feet.

Three methods were tested :

(1) Pruning with a dismantable pole.
(2) Two climbing methods
    (a) Using a Morris Ladder.
    (b) Using a Tree - Bicycle.

For the sake of being brief, this article won't go into detailed description of the equipment or the results. However it can be said that the pole method proved to be more satisfactory. With both feet on the ground the operators felt a lot safer. The tallies were nearly double the tallies from the climbing methods.

Since January 1968 about 6 contract pruners have been employed on 22 to 30 foot pruning using a pole. The better pruners are able to prune about 400 stems per week. With a price of $21 per 100 stems this gives them a weekly earning of $84.

It must be noted that only site qualities 1, 2 and 3 are considered for this extra high pruning. Of the 100 stems per acre originally selected for high pruning only 50 of the best trees per acre are pruned; the remaining are marked out.

The pole-saw set - up most favoured is a 24 foot long $1\frac{1}{2}$" external diameter - 20 gauge aluminium pipe used as the pole. Mounted on it is the Gnangara blade. The blade is an important feature of the whole design (it has $3\frac{1}{2}$ teeth per inch). The total weight of both pole and saw is not more than 7 lbs.

It is felt that pole pruning to 30 feet is possible and more efficient than any climbing method. However there must be a height limit after which it is not possible to prune with a pole. This limit seems to be about 35 feet.

Talking about off-the-ground techniques,here is a suggestion from one individual. He suggests the Department train a gang of gorillas. These agile cousins of man, armed with handsaws could be very effective. It would involve requisitioning large amounts of bananas.

## SOMETHING FOR THE EGO

Feeling depressed, run-down and un-appreciated ? Are you an Assistant Forester in an out-station who works a 60 hour week, or a DFO whose reports to Head Office are never acknowledged ? Then the following extract is for you.....

### A Schiller Eulogy of the Forester

In an old forest magazine, SYLVAN, is a story about Germany's great poet, Karl von Schiller. Schiller, taking rest at Illmenau, Thuringen, met by chance a forester who was preparing a plan of management for the Illmenau forest. A map of the forest was spread out on which the cuttings for the next 220 years were projected and noted with their year number. By its side lay the plan of an ideal coniferous forest which was to have materialized in the year 2050. Attentively and quietly the poet contemplated the telling means of forest organization and especially the plans for far distant years. He quickly realized, after a short explanation, the object of the work and gave vent to his astonishment. "I had considered you foresters a very common people who did little else than cut down trees and kill game, but you are far from that. Your work unknown, unrecompensed, free from the tyranny of egotism, and the fruit of your quiet work ripens for a late posterity. Hero and poet attain vain glory: I would like to be a forester".

H.S. Graves, in Science
News letter, Dec., 20, 1926.
(Quoted in Journal of Forestry,
Vol. 65 (3) (1967).

# THE RECLAMATION OF QUARRIES AND WORKED OUT GRAVEL PITS

by A.B. Selkirk.

There is a demand by a public, becoming more and more aware of the scars marring our roadsides and reserves that has long called for action by controlling authorities. This is to conceal in some way those bare uninviting areas, Quarries and worked out Gravel Pits.

In some cases the advice of local foresters has been sought as to what are the most suitable trees for quick regeneration of these harsh places and in some cases considerable expense has been incurred in obtaining planting stock alone.

It is a disappointed and frustrated forester who later inspects some of these plantings and finds that either his advice has been ignored or the Shire foreman considers all trees just trees and has sited a Tasmanian blue-gum on a two inch depth of hard clayey gravel.

The purpose of this article is to set out the purpose of re-habilitation, a prescription for planned planting, a means of continued maintenance of such areas and suggestions as to their future uselfulness.

An inspection within the Mundaring and Kalamunda Shires show that some pits date back 70-80 years and some of the oldest are the most interesting as they have been carved out of the laterite by pick and shovel and horse and dray. In some, meandering canyons with mesa type islands have been left. In these there is already developed the foundation for a childrens adventure play ground.

It is also apparent from some of the older pits what will happen if nature is left alone to cover them. The often used phrase that "time and nature will heal the man-made scars" means that they will eventually be covered by dumped watsonia, dual leafed hakea, holly leafed dryandra, contorted mallee and bull banksia thickets plus other wolf-type species which make these areas only less interesting except for the purpose of concealing old car bodies and still more dumps of watsonia bulbs.

As most of these areas are either on Crown Lands, on the verges of, or in State Forest, their rehabilitation should have a flexible purpose; e.g.

a) They should be regenerated to the maximum capacity of the site.
b) They should have maximum access for public recreation.
c) They should eventually be placed under a caretaker arrangement with a local club or committee dedicated to the study of native flora and wildlife with continued contact with local foresters or Shire.

Most of these areas do not offer any encouragement to a tree planter. They are in fact man-made barrens having the only advantage that all competition has been removed. Over the years in my movements within our

wealth of native flora I have always found the natural barrens the most interesting. Here on the poorest shallow soil, often water logged in winter and sun scorched in summer, there exists an unbelievable wealth of shrubbery. It is from these areas that we must select the most showy species to cover the portion of the Gravel pit that will not support a canopy of even mallee form trees.

In the initial preparation of the planting site e. g. the pushing in of overburden and ripping of compacted floors, it should be considered a necessity to leave a central portion graded bare for parking and playing areas.

The planting plan should have three main belts which would merge into each other; e. g.,

1. Forest species with understory.
2. Mallee forms with shrubbery.
3. Heath forms with prostrate plants.

It will be found that the prostrate plants in time will catch and retain wind blown leaves and seeds from the surrounding forest. Self regeneration from seed will then commence and thus increase the rate of Reclamation.

All plants and trees being planted and juvenile stock already on the site should be fertilised with a mixture of 50% Blood and Bone and Potato Manure (E) at a depth of 8" to 12" at a rate of 2 oz to 5 oz per plant depending on the specimen's size and expected growth rate. It is important to do this at time of planting or in mid-winter and at the depth mentioned or the maximum possible depth obtainable, making sure no fertiliser is spilt or scattered on the surface as this will quickly encourage exotic grasses and so increase the fire danger. Fertilising at depth should be followed up at 4 to 5 year intervals. The results will be rewarding.

With the concentration of flowering species it can be expected that bird life will increase on the reclaimed sections. With this in mind, I have included in the suggested planting list one exotic: the humble lucerne tree. It is a fire retardant and in consequence should be planted on the outer perimeter as a widely spaced understory specimen. It is a great source of food for bird life and our small marsupials. Its powers of survival through drought have long been proven as has its persistence to survive in ever recurring cycles of self regeneration.

1 Though most gravel pits are sited on high, well drained land, it does happen in some instances that a water soak is present on the lower section. Here a dam could be constructed to catch run-off. Where ever these conditions prevail, every use should be made to hold this water far into the summer. It is invaluable as a pick-up spot when control burning and of course again the adventure play ground for the young.

A source of supply for the suggested planting list can of course come only from the adjacent forest areas. I have observed over the years that our preparation of pine plantation areas produce a natural nursery for native flora which eventually becomes engulfed and destroyed by the closing pine canopy. If obtained from this source as wildlings no inroads would be being made on the protected areas. Other sources are of course seed which are ever abundant within the district.

Listed below are the main species. This could be added to as time goes by, with the annuals and the trigger plants etc, too numerous to mention, and of course extended beyond the purpose of this article.

## SUGGESTED SPECIES FOR PLANTING ON PROPOSED RECLAMATION AREAS AND DENUDED ROAD-SIDES

| Forest Types | Common Name |
|---|---|
| Eucalyptus microcorys | Tallow wood |
| " astringens | Brown Mallet |
| " accedens | Powderbark Wandoo |
| " calophylla (Var Rossa) | Pink Flowered Marri |
| On wet areas | |
| Eucalyptus rudis | Flooded Gum |
| " camaldulensis | River Gum |
| **Mallee Types and Short Understory Trees** | |
| Eucalyptus caesia | Pink Flowered Mallee |
| " macrocarpa | Mottlecah |
| " ficifolia | Red Flowering Gum |
| Hakea laurina | Pincushion Flower |
| Banksia grandis | Bull Banksia |
| Persoonia longifolia | Long Leafed Persoonia |
| " elliptica | Wild Olive |
| **Shrubbery and Short Understory Shrubs** | |
| Calothamnus quadrifidus | One-sided Bottle Brush |
| Acacia drummondii | Drummondii Wattle |
| " " (Var Major) | " " |
| Isopogen roseus | Rose cone Bush |
| " formosus | Graceful Rose Cone Bush |
| Petrophila biloba | Granite petrophila |
| Hovea chorizemifolia | Holly leafed hoves |

| | |
|---|---|
| Hovea pungens | Granite Hovea |
| Pimelea suaveolens | Scented Banjine |
| " spectabilis | Bunjong |
| " rosea | Pink and White Banjine |
| Sollya fusiformis | Australian Blue Bell |
| Hupocalymma robustum | Pink Myrtle |
| Dampiera linearis | Blue dampiera |
| Scaevola striata | Royal Robe |
| Hibbertia montana | Mountain Primrose |
| " hypericoides | Buttercup |

Shrubbery and Short Understory Shrubs

| | |
|---|---|
| Leschenaultia biloba | Blue Leschenaultia |
| Anigosanthus manglessii | Red & Green Kangaroo Paw |
| Grevillea wilsonii | Wilson's grevillea |
| " drummondii | Drummond's grevilles |

Heath-like Plants Requiring Open Areas

| | |
|---|---|
| Hakea ruscifolia | Lamb's Tail Hakea |
| Beaufortia elegans | Elegant Beaufortia |
| Grevillea bipinnatifida | Granite grevillea |
| Verticordia insignis | Pink Morrison |
| " picta | Pink Feather Flower |
| " huegelii | Red & Yellow Feather Flower |
| " multiflora | Yellow Flowered Feather Flower |
| Melaleuca scabra | Rough Honey Myrtle |
| " radula | Graceful Honey Myrtle |
| " lateritia (Wet Spots) | Red Flowered ti-tree |
| Banksia sphacrocarpa | Round fruited Banksia |
| Calythris angulata | Yellow calythrix |
| " fraseri | Pink Summer calythrix |
| " glutinosa | Glutinus Calythrix |
| Darwinia citridora | Lemon scented Darwinia |
| Leucopogon insularis | Nil |
| " strictus | Nil |
| " oppositifolius | Nil |
| Andersonia caerulea | Nil |
| Loudonia aurea | Common Pop Flower |
| Agrostoerinum scabrum | Blue Grass Lilly |
| Astroloma microcalyx | Native Cranberry |
| " microdonta | |
| Lambertia multiflora | Many Flowered Honey-Suckle |
| Thysanotus multiflorus | Fringed Lilly |

Prostrate Type Plants

| | |
|---|---|
| Kennedya prostrate | Running Postman |
| Trichinium manglessii | Rose Tipped Mulla-Mulla |
| Hemiandro pungens | Snake Bush |

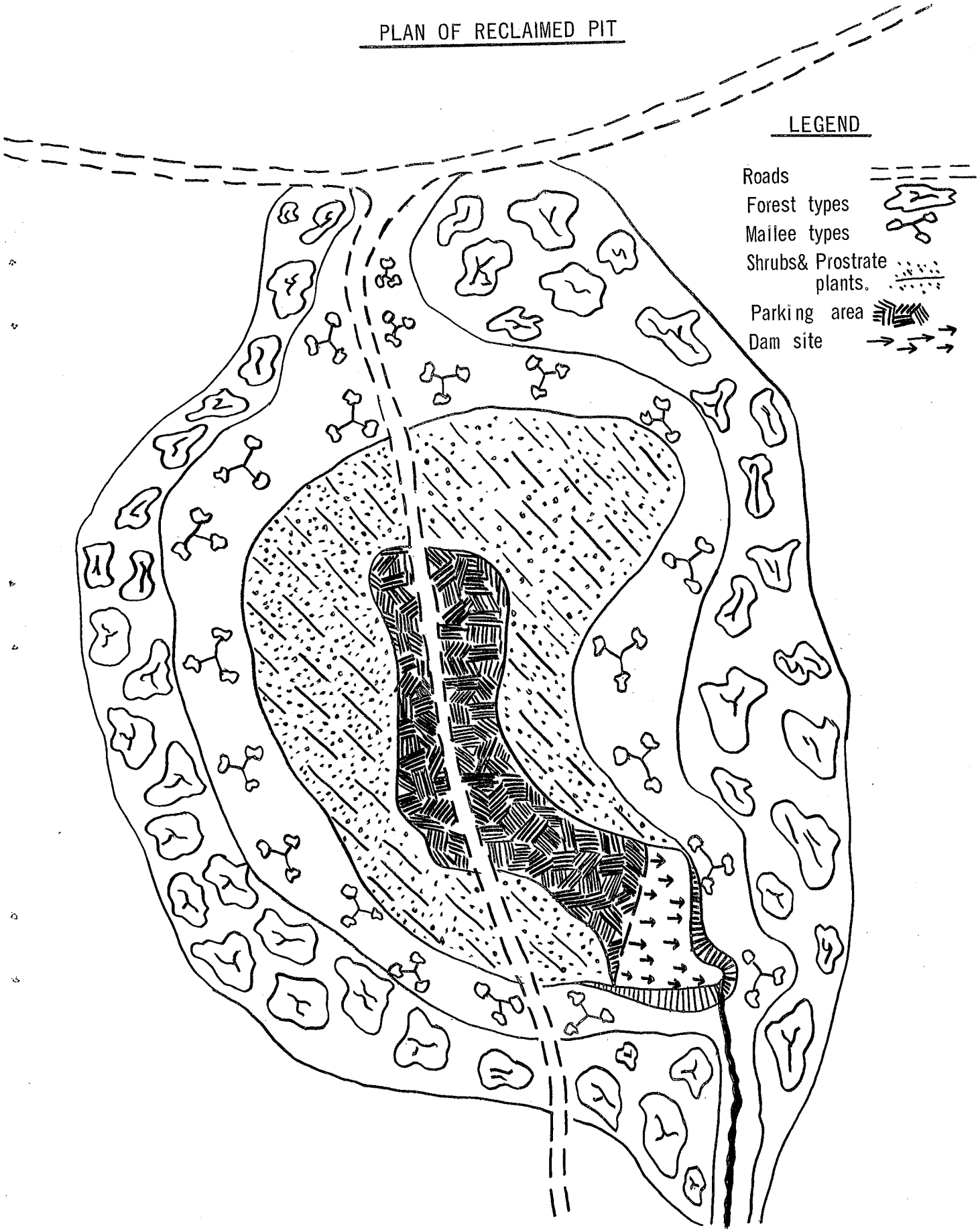
Creeper or Trailing Type Plants

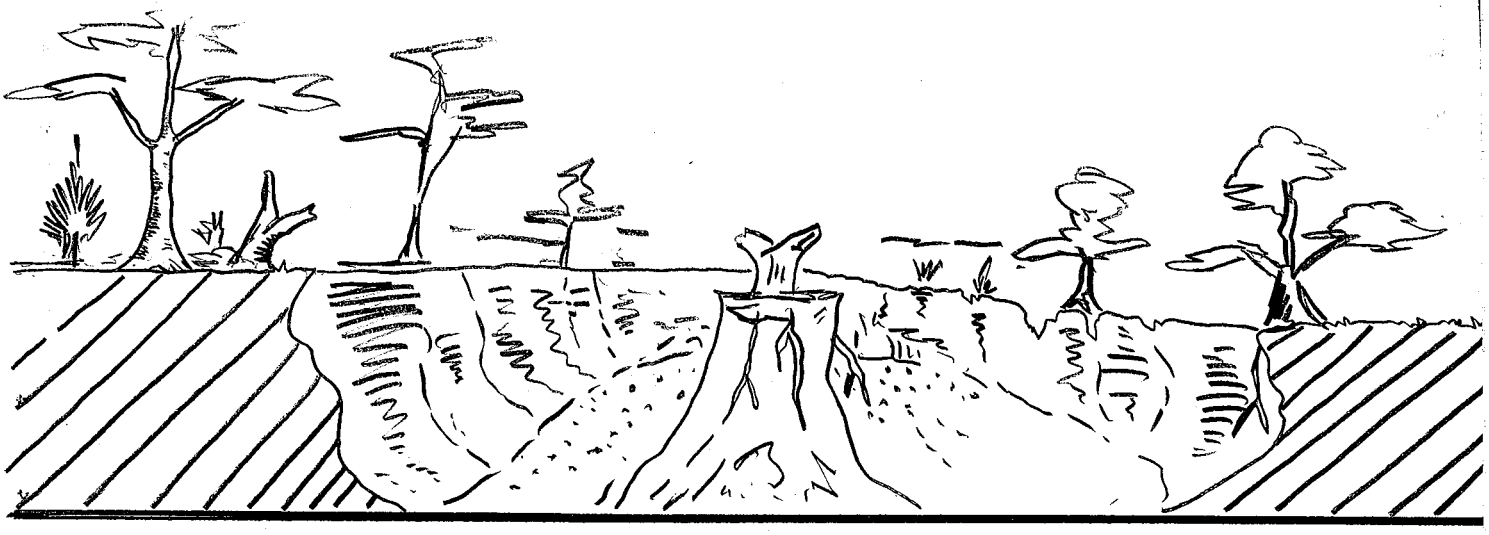
| | |
|---|---|
| Kennedya coccinea | Coral vine |
| Pronaya elegans | Elegant pronaya |
| Billardiara floribunda | White Flowered Billardiara |
| Clemates pubesens | White Clemates |

Exotic Types

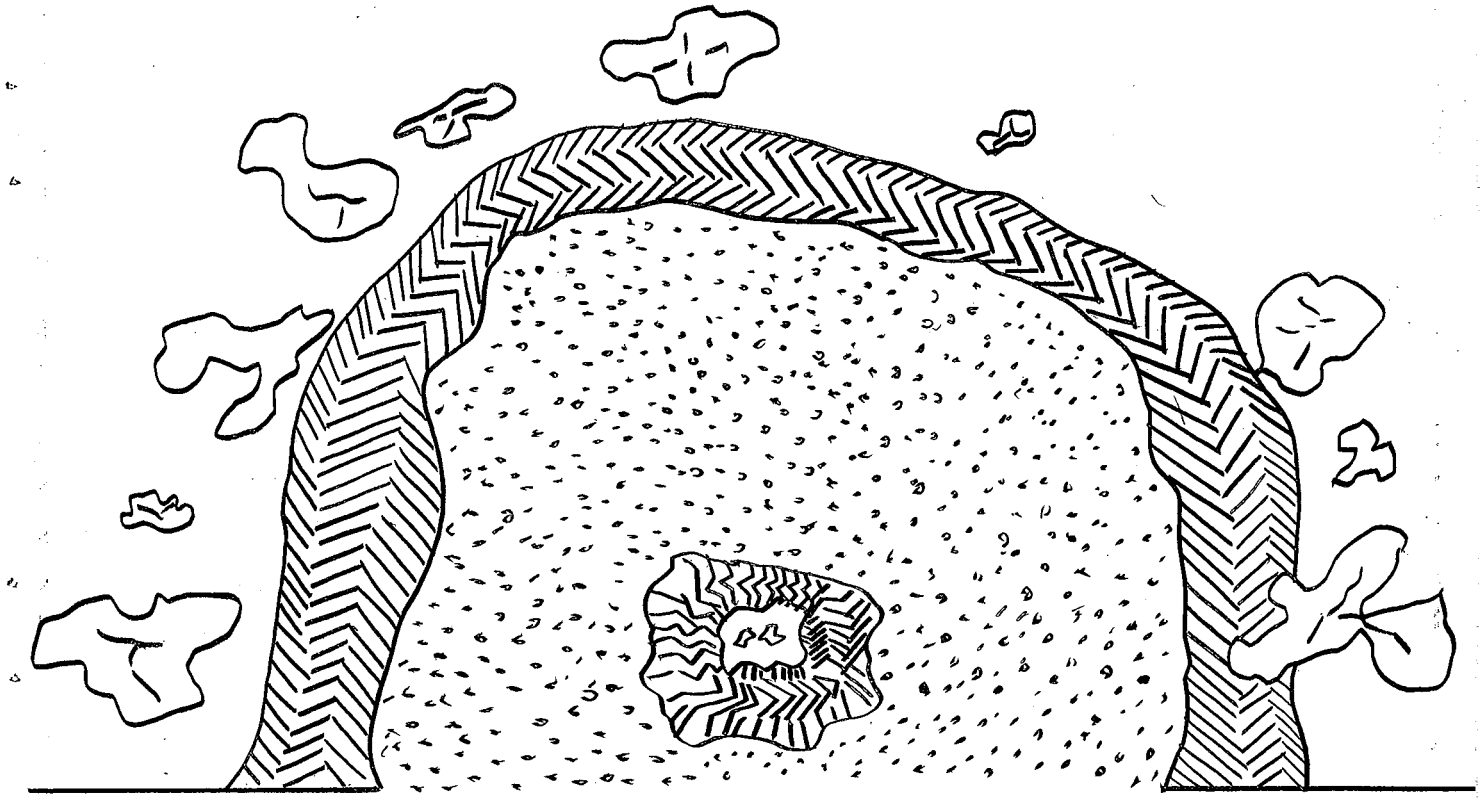
| | |
|---|---|
| Cytisus proliferus (Understory) | Lucerne Tree |
| Papyrus ? (Water Growth) | Egyptian Papyrus |

# PLAN OF RECLAIMED PIT





PROFILE SECTION OF MESA TYPE PIT



PLAN SECTION OF MESA TYPE PIT

## BIG KARRI

by F. G. Quicke.

Near Mt. Burnside - Shannon River - four logs were taken to the mill :

| | | | | |
|---|---|---|---|---|
| Butt log | 32' | 21'2" | mid girth | 1141 cu. ft. |
| Second log | 33' | 18'8" | " " | 915 " " |
| Third log | 34' | 18'2" | " " | 893 " " |
| Fourth log | 49' | 14'2" | " " | 783 " " |
| | 148 | | | 3732 cu. ft. |

Stump Height 5'
Crown Length 89'
? Height
Total Length: 242'
Loadage: 74.6 loads.
G.B.H.O.B.: 28'8"

If we apply the usual formula to the G.B.H. and bole length of 0.6 (as used for calculations for "big trees" in earlier Forest Notes) we estimate the volume to be 116 loads.

The figure 116 loads makes the log truck look pretty good to bring that to the mill in four trips.

Any comments?

## COLLIE DIVISION SERVICE RECORD.

### "An Old Timer" Retires from the Collie Division.

by J.S. Evans.

Can any other Division equal or surpass this record of long service for a wages employee (or staff member) ?

Wally Read, an Overseer in one of the Collie Gangs, retired this year after having officially been in the employ of the Department for 41½ years, 36½ yrs. of which was continuous. Wally began in the Forestry in 1925, but because of the depression was retrenched in 1930 for a few months.

At his send off in January this year Wally was presented with an electric shaver by his work mates and members of the staff. Wally reminisced on his long employment with many yarns in the typical style of the old bushman. He was a bit "green" when he started he said. On regeneration work at the start the Overseer gave Wally an axe and told him to fall a fair sized Jarrah tree. When the Overseer returned later Wally was still battling away at the scarf and wasn't doing such a good job. The Overseer sarcastically remarked that if he didn't get a move on the wood would grow over the cut before he felled the tree.

Transport in the early days of forestry used to be by horse. An axe and tommy hawk were attached to the saddle, a water bag hung below the horses neck, rations in the saddle bags, along with a rake head, for which a handle was cut from a sapling when the need for it arose.

Later transport was by a 15 cwt Bedford utility with two 30 gallon water tanks which carried an Overseer, four men and a telephone boy. Water was pumped by a hand operated semi-rotary pump. Occasionally, over enthusiastic operators on the pump broke the handle whilst trying to reach the burning branches.

Recent transport such as 2-3 tone Bedford Gang Trucks with lown down pumps were "just the shot", Wally reckoned.

One time Wally went into the local Co-op to buy a pair of boots, size ten. The salesman told Wally that he had run out of size tens but Wally said that it didn't matter that two size 5's would do!

An accomplished musician, Wally was well known over a large area for his saxophone playing ability, usually playing at Balls and Dances. Wally also plays the clarinet, guitar and mandolin.

Wally now lives in retirement in Collie.

# ONE WAY TO SELECT 100 FINAL CROP TREES PER ACRE.

by A. Kesners

Marking for high pruning is usually done to a density of 100 trees per acre, and various methods are used to achieve this.

The most common one used in our Radiata plantations is based on a simple proportion of total number of trees per acre to the number of trees to be marked. Thus if the area contains 800 trees to the acre and 100 of these have to be selected, one tree in eight is marked. Provided the spacing between trees is constant and accurate, this method also will be accurate, assuming of course that an allowance for extraction and cross tracks is made.

In our northern pinaster plantations the initial spacing in some of the older plantings, however, is rather inconsistent and erratic, and the above method therefore could not be used satisfactorily. Different markers developed their own systems, but all these systems, with variations, had one feature in common - they were based on subdividing an area into various size grids, either by pacing only or by pacing and demarcation.

For example, in an area with rows 6 ft. apart, and four rows being selected from at a time, the following calculation was made:

43,560 sq. ft. = 1 acre
435.6 sq. ft to 1 tree
4 rows at 6 ft apart = 24 ft.
436 divided by 24 = 18 1/8ft.
66 ft = 22 paces (by the writer)
18 1/8ft = approx. 6 paces.

Thus the area is divided into 24 ft x 18 ft grids, and in every six paces taken by the marker, one tree is marked.

Subsequently an improved formula was developed, which basically is an extension of the above principle:

$$\text{Number of paces to be taken to mark one tree} = \frac{\text{constant}}{\text{No. of rows being selected from} \times \text{distance between rows}}$$

The constant is determined by the number of paces to the chain taken by the marker:

| No. of paces per chain | Constant |
|---|---|
| 22 | 145.2 |
| 23 | 151.8 |

| No. of paces per chain | Constant |
|---|---|
| 24 | 158.4 |
| 25 | 165.0 |
| 26 | 171.6 |
| 27 | 178.2 |

Thus to apply the previous example to this formula:

$$\frac{145.2}{4 \times 6} = 6.05 \text{ or } 6 \text{ paces}$$

Provided the marker maintains the length of his pacing constant, the error per acre will be negligible. However, due to undergrowth, low pruning debris and occasional inconsistency in pacing, this is not always the case. Therefore periodic spot checking of ones work is necessary. A square chain picked at random was used by most markers, but although being a useful guide, it is not sufficiently reliable. Half acre lots also were tried and this proved to be a much more exact check, but of course also much more time consuming.

Therefore a method was sought which would retain the speed and flexibility of the pacing method whilst eliminating inaccuracy due to natural obstructions and human error.

The answer to this was to count all trees marked without extra loss of time or mental effort. To do this a row counter of a knitting machine was originally used (despite strong protestations by Mrs. Kesners). Subsequently tally meters were ordered and used. The tree marker carried this little instrument attached to his index finger, and as each tree was marked it was also tallied. This of course was done whilst still taking the required number of paces. A glance at his progress figures on the face of the tally meter enables the marker easily and instantaneously to check the rate of his marking at any stage - at the end of each "run", or at the half way or quarter mark, and adjust it if necessary. After completion of each "block" (i.e. an area between two extraction tracks), the total number of trees marked was read off the counter and checked against a previously prepared table, which, in the case below, applies to a 6 ft. spacing between rows:

| No. of Rows. | Length of Block in Chains | | | |
|---|---|---|---|---|
| | 10 | 11 | 12 | 13 |
| 1 | 10 | 11 | 12 | 13 |
| 2 | 20 | 22 | 24 | 26 |
| 3 | 30 | 33 | 36 | 39 |
| 4 | 40 | 44 | 48 | 52 |
| 5 | 50 | 55 | 60 | 65 |
| 6 | 60 | 66 | 72 | 78 |
| 7 | 70 | 77 | 84 | 91 |
| 8 | 80 | 88 | 96 | 104 |
| 9 | 90 | 99 | 108 | 117 |
| 10 | 100 | 110 | 120 | 130 |
| 11 | 110 | 121 | 132 | 143 |
| 12 | 120 | 132 | 144 | 156 |
| 13 | 130 | 143 | 156 | 169 |
| 14 | 140 | 154 | 168 | 182 |
| 15 | 150 | 165 | 180 | 195 |

This particular table is based on 100 trees to a block 10 chains long x 10 rows (=60 ft.), an allowance of 6 ft. (or one row) being made for the extraction track. It can easily be, and has been, extended to cover different spacings and lengths of blocks.

The only extra time this method takes is checking the lengths of blocks before marking. This can be done from 10 scale plans, air photos or by pacing. Since practically in all cases this distance is the same for at least half a compartment, but in most cases for a series of half compartments, the time required to do this is negligible compared to the time gained in not having to maintain periodic spot checks. Besides, the marker is always certain of the exact number of trees he marks in each compartment.

A further application of the tally meter was in checking areas of old marking where the number of trees marked was below 100 and had to be brought up to 100 trees per acre at the same time as the second 100 trees for final thinning were marked. Conversely, it was also used in compartments where old marking exceeded 100 per acre which had to be reduced accordingly.

With increased emphasis on piecework and contract high pruning, this method is proving itself also as a useful time saver in checking contractors payment figures. As the marker completes each compartment, he records the number of trees marked on his 10 scale progress plan as well as a relevant record book. This is later compared against the contractors' payment claims over the respective area high pruned, thus saving physical checks.

In conclusion, a comment regarding the consequence of this work. Marking for high pruning is one of the most important jobs of a plantation officer. The trees he selects will be carried through for the full rotation of the stand. The term "marking for high pruning" has become standard nomenclature, usually associated with a repetative job allocated to a junior officer and regarded as monotonous and not always pleasant. Perhaps, in order to emphasise the importance of this work we should change this term to "selection of final crop trees" and use it habitually.

Agreed.

## On "TERMINOLOGY" - A Voice from the Past

by R. J. Underwood

The concluding paragraph of Mr. Kesners' article on the previous page contained a plea for a change in one of our standard terms.

That the name of a job may have some psychological effect on the worker has been realised for many years in certain other industries, but few of use are aware that it has been discussed in our own Department before. The following fascinating exchange is quoted verbatim from a yellowing copy of a "REPORT OF PROCEEDINGS of a CONFERENCE OF SENIOR OFFICERS of the FORESTS DEPARTMENT held in Perth in July, 1923. The exchange is part of the discussion on the Ring Barking of useless stems which followed a paper on "The Sylvicultural Treatment of the Jarrah Forests" by Assistant Working Plans Officer T. N. Stoate.

"Mr. RULE said there was one point he would like to bring up and that was Mr. Sharp had mentioned that some considerable difficulty was found in getting forest workmen to distinguish the trees in the groups. This was a point that was rather interesting. You could hardly expect a forest workman to distinguish the trees in groups without any education in matters of Silviculture. In this connection he thought most people had found that forest workmentin the department were really very keen on knowing the work they were engaged in, and several times we had been asked very interesting questions about exact silvicultural operations that we were carrying out. With regard to ring barking - he would here quote a little incident. During the (first) war, the War Office decided to cut out the term "fatigue party" and substitute "working party" on the ground that the term "fatigue" gave the soldiers the tired feeling, and he would suggest that the term "ringbarking" be cut out of the silvicultural dictionary as it seemed to create in workmen a lack of interest.

Mr. KESSELL asked did Mr. Rule mean that the actual operation of cutting a scarf round the tree should not be called ringbarking, or did he refer to the general operation of ringbarking?

Mr. RULE replied that the forest workman tended to regard the whole operation as ringbarking. Silvicultural Cleaning or something like that would be a better term to use"

The conference report contains many other comments of great interest and gives one a real insight into the tremendous problems and overwhelming difficulties which faced early foresters. I can thoroughly recommend it as a fascinating evening's reading.

# REGIONAL NOTES

## METROPOLITAN REGION (METRO, MUNDARING, WANNEROO AND KELMSCOTT).

### Staff Changes.

D. F. O. Don Spriggins has been transferred to the Kelmscott Division and A. D. F. O. Charles Kelers to the Mundaring Division.

Forest Assistant Len Shannon of Mundaring has retired and his place taken by Mr. Mullan who is a recent arrival from Northern Ireland.

Mr. Parrish has taken the initial appointment of Clerical Assistant at Gnangara, thus releasing F/G Kurt Haunold for divisional work based at Wanneroo.

### Initial Supering Trials

The Staff of the Kelmscott Division have successfully experimented with a method for doing initial supering at time of planting. A bin attached to the planting machine and operated by one man allows the 4 oz. of Super to be applied a few seconds after the tree is planted.

A full description of the technique will follow in a later issue of Forest Notes.

## BUSSELTON REGION (BUSSELTON, NANNUP, KIRUP).

### Nannup.

Timberjack, an articulated rubber tyred, four wheel drive log skidder is now working in the Nannup plantation extracting pine in short lengths, for the C. P. I. Mill at Busselton. The 18 load U. B. intake of Radiata being supplied from Keenan Plantation will progressively be replaced by supplies from Nannup.

A sorting and bundling machine was used to prepare Pine seedlings in the nursery this year. Attached to the three point linkage of a Ferguson 65, it provides for five girls to cull, count and tie into bundles of 100 and despatch in bags of 500 at a rate of up to 15, 000 per hour. The unit was designed and constructed in the Manjimup Workshop.

The nursery seed sowing machine has been modified to plant any number of rows up to seven, in a nursery bed. This machine will assist with sowing 47 lbs of seed in the nursery this year. to produce 2. 2 million seedlings.

### Margaret River

300, 65' and 70' Karri poles have been delivered to Hicksons

Impregnation Treatment Plant at Picton, for Boultanising, prior to use by the State Electricity Commission. It is anticipated that up to 4000 such poles will be supplied.

Ludlow

Pine fence posts are being supplied to Hickson's at Picton at a rate in excess of 3000 per week from Ludlow, Grimwade and Myalup Plantations. Advantages claimed for pine fence posts are:

1. Being round they are readily driven into an augered hole.
2. They are smooth and resist fire sparks.
3. They do not rot after treatment and so hold staples firmly.
4. They are twice as strong as split Jarrah posts.
5. They are half the weight of Jarrah posts.

They are finding a ready market in the Esperance area.

Tuart planting: a promising trial has been carried out at Ludlow by planting a mixture of P. radiata and Tuart. Difficulty has been experienced in the past trying to establish Tuart, but this trial appears promising.

Vorox AA has been sprayed over a section of this years planting at Ludlow to eliminate grass competition. It would seem this may eliminate ploughing to eliminate grass competition.

Grimwade

Prior to service at Nannup the Timberjack worked for a month's trial on both first and fourth (34 years) thinnings. In the former the product was extracted in bundles of short length and in the latter in long lengths up to 90'.

A tower to dry 24 canvas hoses simultaneously has been installed at Grimwade. It is claimed drying will be achieved in a shorter time and the hose itself when dry will be softer to roll; not the hard board resulting from the cyclone wire rack.

SOUTHERN REGION (MANJIMUP, PEMBERTON, SHANNON RIVER).

The following appointments, resignations and transfers have occurred within the Manjimup Group during the preceding 12 months.

Divisional

Appointments

| | | |
|---|---|---|
| P. F. Liddelow, | Wheatley, Forest Guard | 29. 3. 68 |
| C. R. Bradbury, | Tone River Forest Guard | 29. 3. 68 |

Transfers

| | | |
|---|---|---|
| A/F J.L. Robson | Jarrahdale to Shannon River | 29. 9.67 |
| A/F H.E. Quicke | Gnangara to Wheatley | 3.11.67 |
| F/G J. Martin | Shannon River to Grimwade | 5.12.67 |
| F/G Broadbent | Dwellingup to Shannon River | 7.12.67 |
| F/G Lilley | Pemberton to Nannup | 7.12.67 |
| Silv. O.W. Loneragan | Manjimup to Como | 11.12.67 |
| For. F.G. Quicke | Manjimup to Jarrahdale | 3. 1.68 |
| F/O F.H. Pridham | Dwellingup to Manjimup | 4. 1.68 |
| F/G B.W. Harris | Pemberton to Ludlow | 5. 1.68 |
| F/G A.R. Annells | Busselton to Manjimup | 8. 1.68 |
| F/R R. Kitson | Manjimup to Pemberton | 9. 1.68 |
| A/F H.W. Deadman | Pemberton to Glenoran | 9. 1.68 |
| F/G R.W. Hunter | Manjimup to Shannon River | 10. 1.68 |
| F/G N. Phelps | Shannon River to Nannup | 10. 1.68 |
| F/G W. Russell | Nannup to Pemberton | 7. 5.68 |
| F/G C. Bradbury | Tone River to Grimwade | 8. 5.68 |
| F/G P. Liddelow | Wheatley to Dwellingup | 9. 5.68 |
| A.D.F.O. R. Gobby | Manjimup to Dwellingup | 24. 6.68 |
| A.D.F.O. R.J. Underwood | Mundaring to Pemberton | 27. 6.68 |
| A.D.F.O. H. Campbell | Pemberton to Como | 28. 6.68 |
| F/G T.J. Court | Walpole to Pemberton | 15. 8.68 |
| F/R M.F. Evans | Pemberton to Harvey | 16. 8.68 |

Resignations:

| | | |
|---|---|---|
| A/F N.C, Crawford | Glenoran (Now Workmen's Inspector T.I.R. Act.) | 23.11.67 |
| F/G J. Shugg commenced two years National Service Training | | 15. 7.68 |

Research Branch

Appointments:

| | | |
|---|---|---|
| P.S. Tandy | Tech. Asst. Silvicultural | 5. 1.68 |
| P.E. Christensen | A.D.F.O. - Silvicultural | 11. 1.68 |
| F/G A.R. Annells | Tech. Asst. Silvicultural | 16. 3.68 |
| G. Young | Tech. Asst. Silvicultural | 12. 4.68 |
| M.R. Page | Tech. Asst. Silvicultural | 18. 4.68 |
| R.J. Voutier | Tech. Asst. Silvicultural | 26. 4.68 |
| P.R. Skinner | Tech. Asst. Silvicultural | 16. 5.68 |
| M.D. Forrest (Miss) | Office Asst. Silvicultural | 4. 6.68 |

Transfers:

| | | |
|---|---|---|
| A.D.F.O. McCutcheon | Busselton to Manjimup | 6.12.67 |

Working Plans Office

Appointments:

| | | |
|---|---|---|
| M. O. Smith | Technical Assistant | 26. 4. 68 |
| M. P. Byrne | Technical Assistant | 2. 9. 68 |
| I. R. Hullworth | Technical Assistant | 2. 9. 68 |

Transfers:

| | | |
|---|---|---|
| T/A W. J. Prien | W. P. O. to Research (Fire) | 3. 5. 68 |

## WHAT IS A SAWMILLER

A sawmiller is a combination Bushman, Sawyer, Forester, Haulier, Mechanic, Engineer, Electrician, Salesman, Accountant and Manager.

Anatomically speaking, he resembles a being from outer space. His profile is clear cut, but his face is superficial. His heart is clear, black, sound or boxed. His gums are blue, red, grey and sometimes even spotted. His tongue is like a lamb's, and is invariably grooved. He carries a chip on his shoulder which probably accounts for his fiddle back, and his figure is wavy, curly, striped and swirled. His girth is taken on gross or nett measurement, and may be under or over bark. His arms are held in a radial or crossed position, while his feet are superficial, super, board, lineal and cubic.

His diet consists of sawdust with, of course, beer to wash the sawdust down. His vocabulary is unique, but he contends "bleeding" and "blooming" are not swear words.

He insists he is not a religious man, but he does have a fetish about conversion. His three main loves are wood, bowls or golf, and the last-end or the 19th hole, according to his fancy.

His chief enemies are the foresters with whom he wages constant warfare over royalties, log quotas, and optional logs, and the main roads inspectors who persist in claiming he is overweight, particularly on one axle.

His constant reference to "Dogs", "Cats and Donkeys" is proof of his love for animals, while his pet aversions are "termites" (White ants) and "Borers".

Moisture content is not his capacity to absorb alcohol: corks are not bottle-stoppers: and shakes are not the result of a night out with the boys. A. A. is not responsible for the dry-rot that sets in, and doze is not a cold in the head.

His reference to "Bare-cut", "cleavage", "deep beam" and "dressed and undressed" has nothing to do with the ladies, and romance could not be further from his mind when he talks of clear heart, diamond matching and annual rings.

His competitors claim he has many defects which cause him to break down, but this is the result of stresses and strains and tensions to which he is subject.

He is accused of being a sap and allowing too much tolerance, but though he gives the impression of being the Proverbial nigger in the wood-pile, when stripped of his veneer he is found to have a sound heart, a solid core and is all truewood.

# INTRODUCTION

Unsafe Conditions are the direct cause of some 20% of accidents. They are the most readily identifiable group of accident causes and prevention measures have been widely studied and quite precisely identified.

The unsafe condition may be man made or environmental but in either case there is no need to wait for it to cause an accident before taking remedial action.

The first step in prevention is to identify all the unsafe conditions in each work area.

The second step is to correct them by:

Removing them altogether.

e. g. the damaged axe handle, loose equipment on a gang truck.

Guarding them in a way which prevents unintentional personal contact.

e. g. moving parts of machinery, welding areas.

Protecting the individual with equipment such as helmets, gloves, glasses etc., against their effect.

e. g. prickles, cones, falling limbs.

Frequent and regular Safety Inspections aimed at identifying and correcting unsafe conditions are an essential part of an accident prevention programme and it is every mans responsibility to see that unsafe conditions are corrected.

Seeing, correcting and avoiding accidents from unsafe conditions requires above all else "Safety Awareness". Develop it - for your own sake at least.

## RECORDS AND STATISTICS.

It is extremely satisfying to record that our accident figures for 1967/68 have been reduced to an all time low.

Accident figures in tabular form covering the years 59/60 to 67/68, and also complete divisional figures for 67/68 appear later in this edition of Safety News.

As was mentioned in the Annual Safety Report, five divisions qualified for the 50,000 accident free manhours award and congratulations are extended to the Officers and employees of these divisions for their achievement.

In addition two divisions, namely Collie and Manjimup, achieved 100,000 manhours accident free - spectacular efforts which will be recognised by the presentation of the appropriate N.S.C. award. The next goal is 150,000 accident free manhours.

It is hoped that those divisions who did not qualify for a Safety award during 67/68 will do so during the current year.

During 1967/68 the Departmental frequency rate dropped from 100 to 65. This was as a result of reducing the number of disabling injury accidents by 61 over the previous year. In plain language it means that 61 less people were injured in 1967/68 than were in 1966/67.

This is a major achievement.

As we all are aware the primary consideration of Accident prevention is the humanitarian angle, that it, doing all in our power to prevent people having injury accidents and from having to suffer the pain, the loss of wages and other discomforts which result from accidents.

To accomplish this successfully, co-operation by every individual is essential, from top management down to the junior worker.

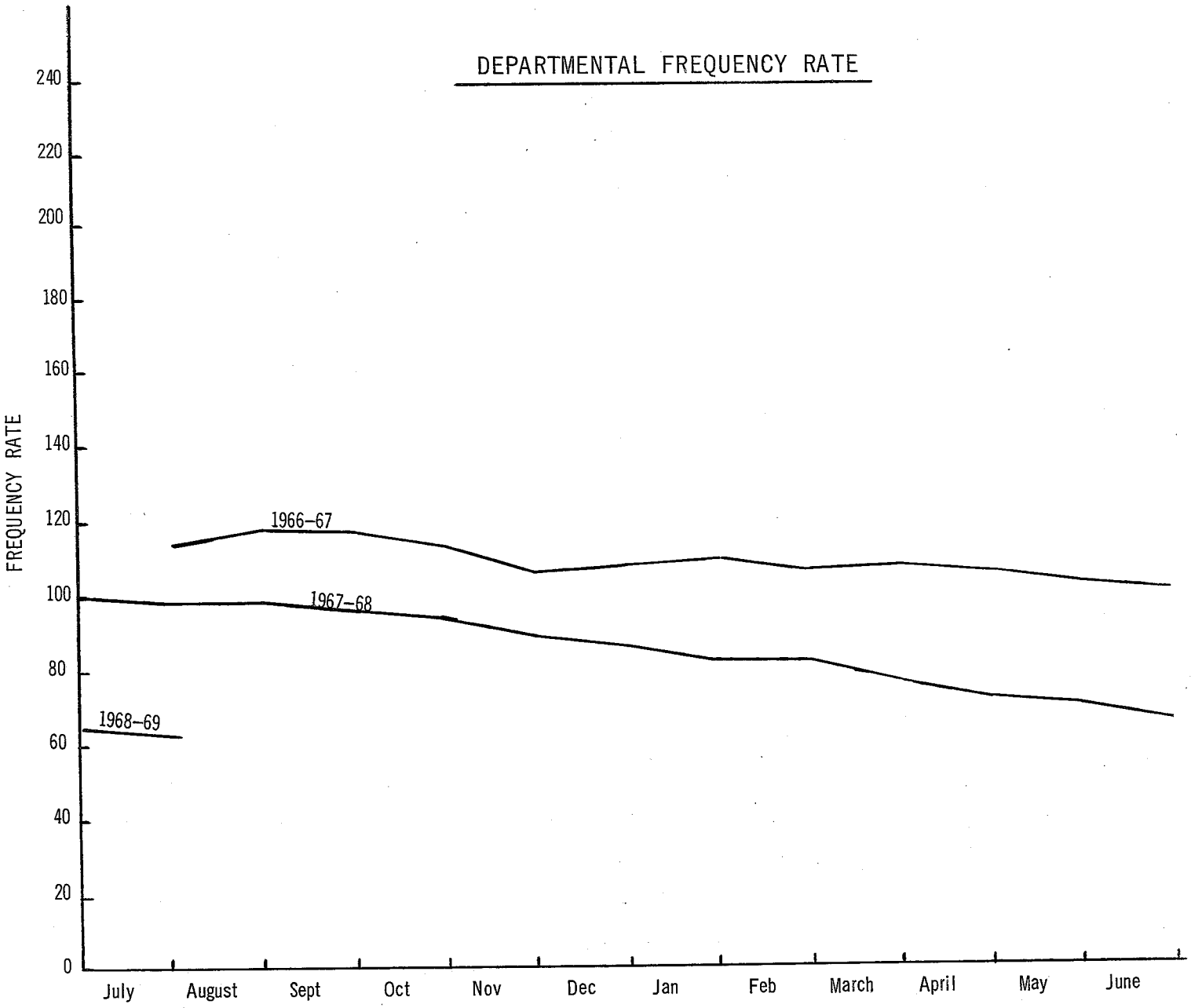
A perusal of the divisional accident figures for 67/68 reveals where this situation exists. It is hoped that the "back-runners" will reduce the lee way during the current year, and by doing so reduce our accident rate still further.

During the past year a number of divisions have availed themselves of the services of the Safety officer for Safety film screenings, Job Safety studies and other matters pertaining to safety.

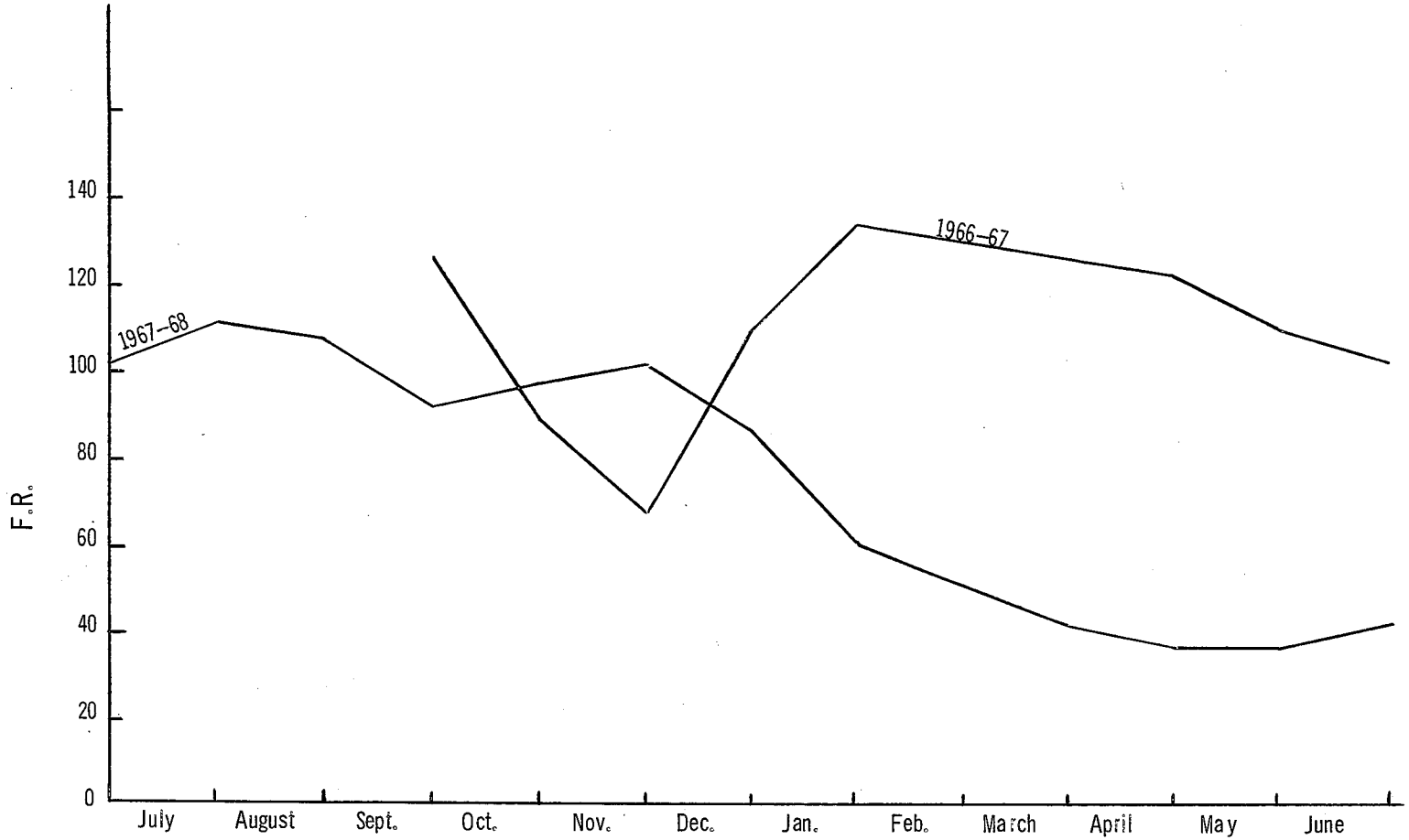
These various functions have proved to be highly successful in establishing the foundation from which successful Safety programmes have developed.

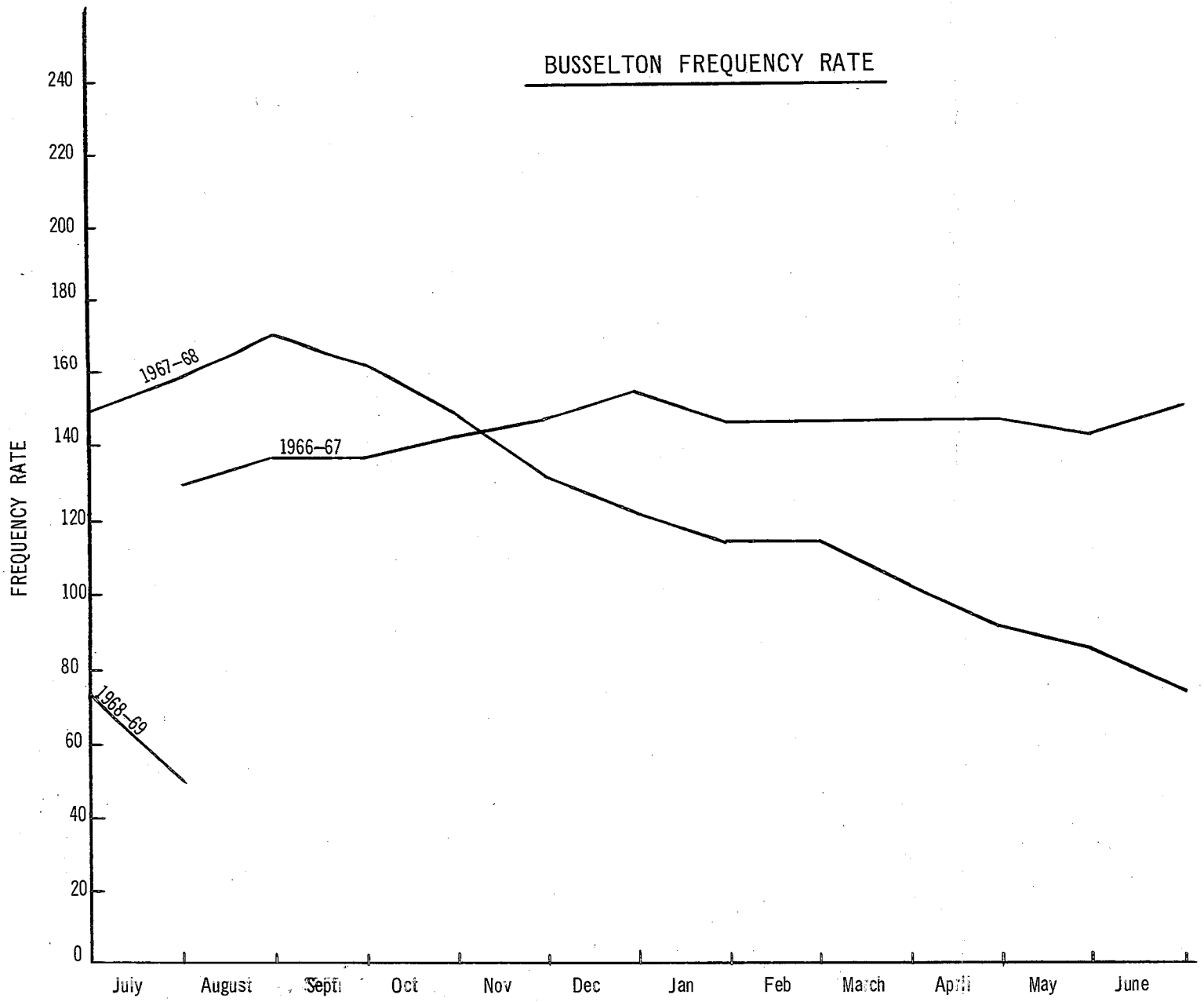
Remember, the Safety officer is available to assist where required.

Call on his services to assist in solving any problems that you may have.


DEPARTMENTAL FREQUENCY RATE
FREQUENCY RATE
240
220
200
180
160
140
120
100
80
60
40
20
0
1966–67
1967–68
1968–69
July
August
Sept
Oct
Nov
Dec
Jan
Feb
March
April
May
June

## MANJIMUP FREQUENCY RATE




BUSSELTON FREQUENCY RATE
FREQUENCY RATE
240
220
200
180
160
140
120
100
80
60
40
20
0
1967–68
1966–67
1968–69
July
August
Sept
Oct
Nov
Dec
Jan
Feb
March
April
May
June

## DEFINITION OF TERMS

The following definitions are in accordance with the Australian Standard Code of Recommended Practice for Recording and Measuring Work Injury Experience. As CZ6 - 1966.

1. MINOR INJURY

Any injury to a person which arises out of and in the course of employment and which requires first aid or medical treatment.

2. SERIOUS INJURY

A work injury requiring treatment by a medical practitioner and which is beyond the scope of normal first aid.

3. DISABLING INJURY

A work injury which results in death or permanent disability or inability to work for at least one full day or shift any time after the day or shift on which the injury occurred, whether or not the days of disability were days on which the injured persons would otherwise have been at work.

4. PERMANENT DISABILITY

A work injury which results in loss or permanent loss of use of any part of the body or loss of bodily facilities.

5. DISABLING INJURY FREQUENCY RATE

The frequency rate is defined as the number of lost-time accidents per million man-hours worked. The number of man-hours is simply the total number of hours worked by all employees in an organisation or department during a month, a year, or any other period of time.

$$\text{Frequency rate} = \frac{\text{number of lost-time accidents} \times 1,000,000}{\text{man-hours exposure}}$$

For example, the factory may work 500,000 man-hours during a year and have eight lost-time accidents. Its injury frequency rate, therefore, would be: $\frac{8 \times 1,000,000}{500,000} = 16$

6. SEVERITY RATE

The severity rate is defined as the number of days charged for disabling injuries per 1,000,000 man-hours worked and is reckoned in a manner similar to the method of computing the frequency rate.

$$\text{Severity Rate} = \frac{\text{total days charged x } 1,000,000}{\text{man-hours exposure.}}$$

For example, the total time charged for disabling injuries in a factory was 208 days. The factory worked 500,000 man-hours during the year. The severity rate, therefore would be:

$$\frac{208 \times 1,000,000}{500,000} = 416$$

## DIVISIONAL DISABLING INJURY ACCIDENTS

1962/63 - 1967/68

| | 62/63 | 63/64 | 64/65 | 65/66 | 66/67 | 67/68 |
|---|---|---|---|---|---|---|
| BUSSELTON | 18 | 20 | 19 | 21 | 24 | 13 |
| MUNDARING | 16 | 15 | 12 | 12 | 10 | 12 |
| DWELLINGUP | 15 | 12 | 17 | 21 | 10 | 5 |
| COLLIE | 24 | 7 | 17 | 9 | 17 | 2 |
| KIRUP | 17 | 19 | 17 | 19 | 13 | 21 |
| MANJIMUP | 16 | 12 | 10 | 12 | 20 | 8 |
| NARROGIN | 2 | NIL | 1 | 3 | NIL | 1 |
| KELMSCOTT | 7 | 9 | 11 | 7 | 2 | 2 |
| COLLIER-SOMERVILLE | 4 | 5 | 8 | 5 | 7 | 4 |
| WANNEROO | 14 | 17 | 17 | 9 | 19 | 10 |
| HARVEY | 31 | 21 | 25 | 26 | 29 | 20 |
| PEMBERTON | 17 | 13 | 14 | 13 | 14 | 5 |
| NANNUP | 10 | 18 | 7 | 15 | 7 | 15 |
| SHANNON | 9 | 4 | 6 | 7 | 8 | 4 |
| TRAINEES | | | | | 5 | 2 |
| | 200 | 172 | 181 | 179 | 185 | 124 |

## DEPARTMENTAL DISABLING INJURY ACCIDENTS

### 1959/60 - 1967/68

| | JULY | AUG | SEPT | OCT | NOV | DEC | JAN | FEB | MAR | APRIL | MAY | JUNE | TOTALS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 59/60 | 13 | 28 | 12 | 10 | 22 | 19 | 3 | 16 | 16 | 12 | 13 | 13 | 177 |
| 60/61 | 11 | 27 | 12 | 14 | 18 | 12 | 29 | 17 | 10 | 7 | 13 | 18 | 188 |
| 61/62 | 14 | 15 | 17 | 19 | 18 | 13 | 13 | 17 | 11 | 15 | 21 | 15 | 188 |
| 62/63 | 16 | 18 | 12 | 8 | 14 | 17 | 21 | 18 | 17 | 21 | 24 | 14 | 200 |
| 63/64 | 16 | 21 | 19 | 20 | 7 | 15 | 19 | 12 | 11 | 14 | 7 | 11 | 172 |
| 64/65 | 16 | 9 | 13 | 8 | 10 | 9 | 16 | 16 | 29 | 19 | 21 | 15 | 181 |
| 65/66 | 26 | 13 | 12 | 11 | 6 | 14 | 19 | 14 | 17 | 13 | 18 | 16 | 179 |
| 66/67 | 17 | 20 | 18 | 15 | 13 | 20 | 17 | 12 | 17 | 10 | 14 | 12 | 185 |
| 67/68 | 14 | 18 | 10 | 13 | 8 | 9 | 10 | 13 | 4 | 7 | 9 | 8 | 124 |

## 1967 - 1968

## DISABLING INJURY ACCIDENTS

| | JULY | AUG | SEPT | OCT | NOV | DEC | JAN | FEB | MAR | APRIL | MAY | JUNE | TOTAL D.I.A. | TOTAL M.H.W. | F.R. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BUSSELTON | 5 | 4 | - | 1 | - | - | 1 | 2 | - | - | - | - | 13 | 177,146 | 73 |
| MUNDARING | 1 | 1 | 1 | - | - | - | - | 4 | 1 | 2 | - | 2 | 12 | 99,632 | 120 |
| DWELLINGUP | - | - | 1 | 1 | 2 | - | - | 1 | - | - | - | - | 5 | 143,396 | 35 |
| COLLIE | - | 1 | - | - | - | - | - | - | - | - | 1 | - | 2 | 135,434 | 15 |
| KIRUP | 2 | 6 | 4 | 2 | - | 2 | 2 | - | - | 1 | 1 | 1 | 21 | 117,320 | 179 |
| MANJIMUP | 2 | 1 | - | 1 | 1 | 2 | - | - | - | - | - | 1 | 8 | 196,113 | 41 |
| NARROGIN | - | - | - | - | - | - | - | 1 | - | - | - | - | 1 | 13,938 | 71 |
| KELMSCOTT | - | - | - | - | - | - | 1 | - | - | 1 | - | - | 2 | 76,319 | 26 |
| COLLIER-SOMERVILLE | - | 2 | - | 1 | - | - | - | 1 | - | 1 | - | - | 4 | 31,885 | 125 |
| WANNEROO | 1 | 1 | - | 1 | 2 | 1 | 1 | - | 1 | - | - | 1 | 10 | 132,554 | 75 |
| HARVEY | 1 | - | 3 | 5 | 1 | - | 2 | 2 | - | 1 | 2 | 2 | 20 | 212,274 | 94 |
| PEMBERTON | - | 1 | - | - | 1 | 1 | - | 1 | - | - | 2 | - | 5 | 104,205 | 48 |
| NANNUP | 1 | 1 | 1 | 1 | 1 | 2 | 3 | - | 1 | 1 | 2 | 1 | 15 | 139,868 | 108 |
| SHANNON | 1 | 1 | - | - | - | - | - | - | 1 | 1 | - | 1 | - | 4 | 61,665 | 65 |
| TRAINEES | - | - | - | - | 1 | 1 | - | - | - | - | - | - | 2 | 26,235 | 76 |
| | 14 | 18 | 10 | 13 | 9 | 9 | 10 | 13 | 4 | 7 | 9 | 8 | 124 | | |
| 1966-1967 | 17 | 20 | 18 | 15 | 13 | 20 | 17 | 12 | 17 | 10 | 14 | 12 | 185 | | |

## AGENCIES OF INJURIES

### 1967 - 1968

| | MACHIN-ERY IN OPERA-TION | VEHICLES | TOOLS HAND | TOOLS POWER | MANUAL HANDLING | HARMFUL CONTACTS | PERSONS FALLING OR STRIK-ING AGAINST | OBJECTS FALLING OR FLY-ING | OTHER | |
|---|---|---|---|---|---|---|---|---|---|---|
| BUSSELTON | | | 2 | | 6 | | 3 | 2 | | 13 |
| MUNDARING | | 1 | 1 | 1 | 3 | 2 | | 4 | | 12 |
| COLLIE | | 1 | | | 1 | | | | | 2 |
| DWELLINGUP | | | | 1 | 1 | | 1 | 2 | | 5 |
| KIRUP | 1 | | 2 | 1 | 3 | 1 | 2 | 11 | | 21 |
| MANJIMUP | | 1 | 2 | | 2 | | 3 | | | 8 |
| NARROGIN | | | | | | | | 1 | | 1 |
| KELMSCOTT | | | | | | | | 2 | | 2 |
| COLLIER-SOMERVILLE | | 1 | | | 2 | | 1 | | | 4 |
| WANNEROO | | | 2 | | 3 | 2 | 1 | 1 | 1 tick | 10 |
| HARVEY | 1 | | 1 | 3 | 5 | 1 | 4 | 4 | 1 bites | 20 |
| PEMBERTON | | | | | | 3 | | 2 | | 5 |
| NANNUP | 1 | | 3 | 1 | 2 | 3 | 3 | 2 | | 15 |
| SHANNON | | | | | 2 | 1 | 1 | | | 4 |
| TRAINEES | | | 1 | | | 1 | | | | 2 |
| | 3 | 4 | 14 | 7 | 30 | 14 | 19 | 31 | 2 | 124 |

## DESCRIPTION OF INJURIES

1967-68 1966-67

| | HEAD | | EYE | | TRUNK | | ARM | | HAND | | LEG | | FOOT | | INJUR-IES & SHOCK | | OTHER | | TOTALS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 66 67 | 67 68 | 66 67 | 67 68 | 66 67 | 67 68 | 66 67 | 67 68 | 66 67 | 67 68 | 66 67 | 67 68 | 66 67 | 67 68 | 66 67 | 67 68 | 66 67 | 67 68 | 66 67 | 67 68 |
| BUSSELTON | | | 2 | 1 | 10 | 6 | 2 | | 6 | 1 | 4 | 3 | | 2 | | | | | 24 | 13 |
| MUNDARING | | 1 | | 1 | 5 | 6 | 2 | | | 2 | 2 | 2 | 1 | | | | | | 10 | 12 |
| DWELLINGUP | 1 | 1 | 2 | | 3 | 2 | | | 1 | | 1 | 1 | 2 | 1 | | | | | 10 | 5 |
| COLLIE | | | 1 | | 6 | 1 | 1 | | 3 | 1 | 4 | | 1 | | 1 | | | | 17 | 2 |
| KIRUP | | 1 | | 3 | 6 | 3 | | | 4 | 8 | 3 | 5 | | 1 | | | | | 13 | 21 |
| MANJIMUP | 2 | | 2 | | 6 | 1 | | 1 | 5 | 3 | 3 | 3 | 2 | | | | | | 20 | 8 |
| KELMSCOTT | | | | 2 | 2 | | | | | | | | | | | | | | 2 | 2 |
| COLLIER-SOMERVILLE | | | | | 5 | 2 | | | 2 | 1 | | | | 1 | | | | | 7 | 4 |
| WANNEROO | | | 2 | 4 | 5 | 1 | 2 | | 5 | | 2 | 1 | 3 | 3 | | | | 1 | 19 | 10 |
| PEMBERTON | | | | 1 | 2 | | 3 | | 6 | 1 | 1 | 2 | 2 | 1 | | | ticks | | 14 | 5 |
| HARVEY | 1 | 1 | 2 | 3 | 9 | 5 | | 2 | 8 | 4 | 5 | 3 | 4 | 1 | | | | 1 | 29 | 20 |
| NANNUP | | | 1 | 2 | 2 | 4 | | 1 | 1 | 4 | | 3 | 3 | 1 | | | | | 7 | 15 |
| SHANNON | | | | | 3 | 2 | 1 | | 2 | | 1 | 1 | 1 | 1 | | | | | 8 | 4 |
| NARROGIN | | | | | | 1 | | | | | | | | | | | | | nil | 1 |
| TRAINEES | | | 2 | 1 | 1 | | | | 1 | 1 | 1 | | | | | | | | 5 | 2 |
| | 4 | 4 | 14 | 18 | 65 | 34 | 11 | 4 | 44 | 26 | 27 | 24 | 19 | 12 | 1 | nil | nil | 2 | 185 | 124 |