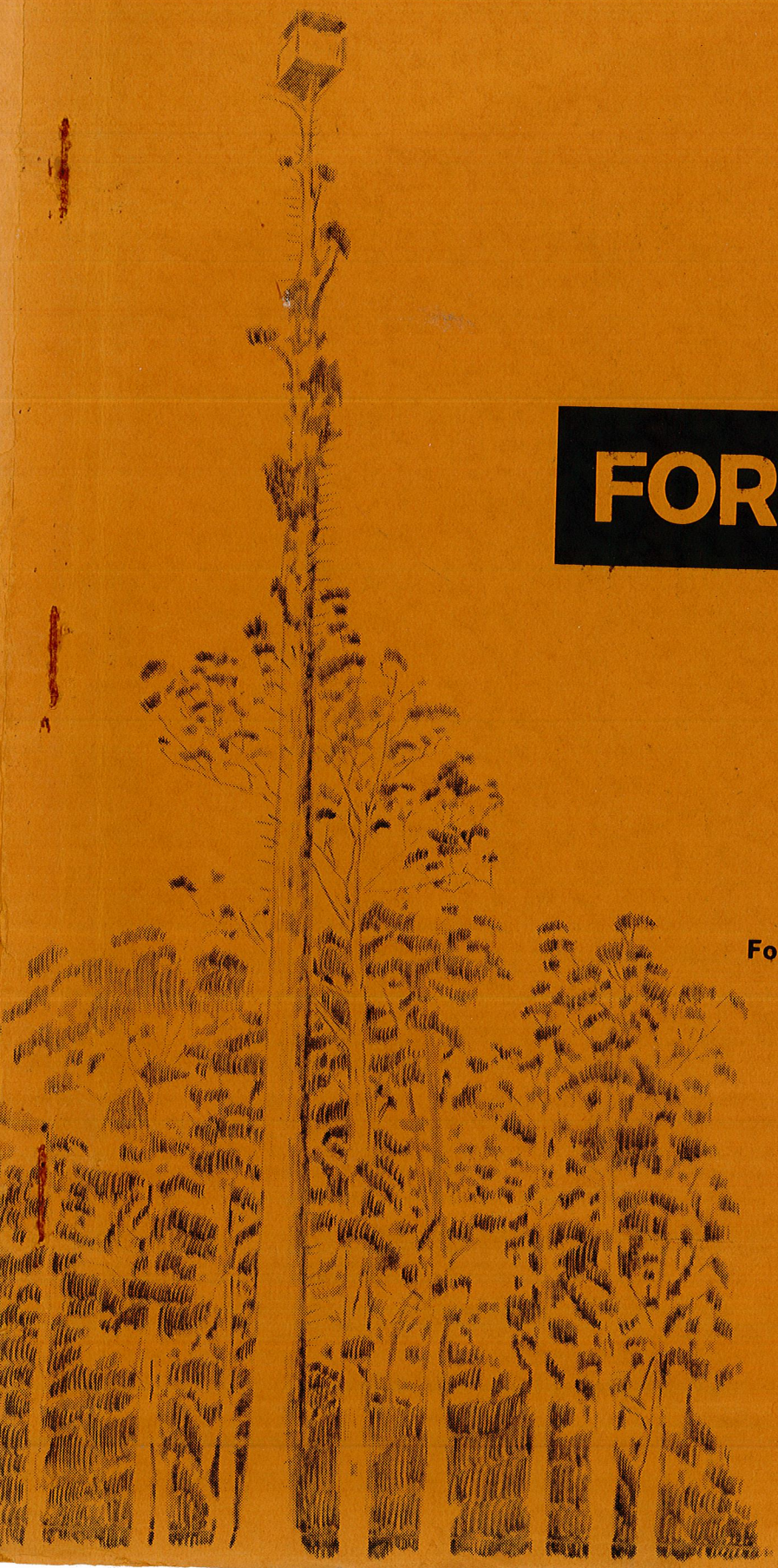

FOREST NOTES

Forests Department Perth Western Australia

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Editor : R.J. Underwood

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The Editor,
"Forest Notes",
Forests Department,
PEMBERTON.

THE WILD COUNTRY

Dear Sir,

I read with great sympathy your article on "The Wild Country" in Forest Notes Vol. 8, No. 1.

I felt a surge of resentment that we seem obliged to appreciate its beauty with nostalgia-in-advance. There is a sense of inevitability that man will change all this.

However, upon further consideration, it is clear that it is not the physical presence of man that changes, so much as the success of his dollar producing ventures. As you suggest the place has a distinct sense of History. Many things stimulate the imagination; ... To stand on top of Cliffy Head knowing that this and the jagged offshore tooth of Chatham Island was the first Australian landfall of Captain Vancouver in 1791; before him, un-named sealers and whalers would have put ashore, no doubt indistinguishable from your later land based fishermen, except that their supplies would be in wooden rather than plastic containers; ... The old cottages mouldering away among the Peppermints; ... Even the crossing over the Warren used by the Oil search early in the Century. These things derive their fascination from the presence of man. However, the environment did not change because none were really successful.

I find it interesting to compare this area to that around Cape Naturaliste. Both are similar in many ways. In the latter relatively little is not alienated and in the process of rapid development. The developed farming areas have a beauty of their own, particularly when clearing is not overdone. Good homesteads, well sited and surrounded, add a pleasing touch of civilization. Topography can be appreciated better when it can be seen. However, the original character is gone forever. All that will remain will be a fringe along the seashore, destined in all probability for eventual extinction.

Whoever must eventually decide the fate of this tract of the South Coast, should give serious consideration to its retention as "Wilderness". Its known capacity to produce "High Adventure and Discovery" could far exceed its capacity to produce dollars.

B.J. White.

The Editor,
"Forest Notes",
Forests Department,
PEMBERTON.

EASTERN OBSERVATION OF BULLICH

Dear Sir,

Following D.H. Perry's letter in March's issue of "Forest Notes", a hesitant note is made of an observation in the east, of Bullich (Eucalyptus megacarpa). It is growing very freely on a granite knoll some 400 feet high. The knoll is an outlier of Mount Lindesay and it can be glimpsed through the jarrah forest on Stan's Road at reference post JP 140/1. The longitude is about 117°22' E.

The knoll is in itself worthy of a visit for anyone travelling in the Rocky Gully/Mt. Barker area. The granite rises sheerly out of the forest in a great wall face and has been weathered into enormous boulders. On the summits there are two or three "Devils Marbles" of note, one in particular is about 12 feet high and about 30 feet in girth and is so finely balanced that apparently a child could over-balance it. There are magnificent views south over the upper Denmark farms, to Wilson Inlet and East to the Porongorups and Stirlings. Walking time from Stan's Road to the summit is about 30 minutes.

The Bullich grows right on top of the granite mass in small pockets of soil, and the tree height is only some 15 feet, but in a main ravine on the eastern side of the knoll it grows to some 50 feet. No doubt, Bullich also occurs in the Porongorups, and Ted Cooper, who showed me the species near Stan's Road, may be able to confirm its occurence further eastwards.

A.D. Mather.

RETIREMENT OF JOHN CURRIE, SENIOR FORESTER

A gathering was held at Narrogin on April 23, 1970 at which the opportunity was taken to say farewell to Senior Forester John Currie who is retiring for personal reasons.

The Conservator and Deputy Conservator were present together with 18 other officers and some of Jack's contemporaries viz. Messrs Alan Harris, Jack McCoy, John Thompson, Bill Ross, George Brooking and Muir.

Mr. Currie's career with the Department commenced when he joined the apprenticeship scheme in January 1924, at the age of 15 and with a salary of $1.75 per week. Through the generosity of the times this was increased to $2.25 in January 1925 and to $3.00 per week in 1926.

During the period 1925 to late 1927 he was variously stationed at Collie, Jarrahwood, Cuballing and Lol Gray (part of Narrogin Division) and then spent 6 months with a classification camp under John Thompson in the Manjimup Division and then continued moving from place to place until appointed as Assistant Forester at Narrogin in September 1936. He has been in the Narrogin District for the 34 years since then, at Dryandra and more recently living in Narrogin where he intends to remain during his retirement.

Jack is best known for his optimism for the future of Mallet plantations and for the excellence of the nursery stock he has raised for principally dry land areas. His record for keeping fires out of his 19,000 acres of Mallet plantation for the whole of his 34 years in the district is a remarkable one and is evidence of Jack's enthusiasm and ability to obtain co-operation from the agricultural community, and is indeed a magnificent performance.

P.N. Hewett.

EVALUATION OF CONTROL BURNING WITH FALSE COLOUR AERIAL PHOTOGRAPHY

by F.J. Bradshaw

During January of this year a trial was conducted to test the usefulness of Ektachrome Infra-red film for evaluating the success of aerial control burns. The aim was to map the area in four classes:

(a) not burnt
(b) scrub burnt
(c) scorched
(d) defoliated

Vertical photographs were obtained using a 70 m.m. camera borrowed from the R.A.A.F. The bulk of the photos were taken from an altitude of 10,000 feet giving an approximate scale of 40 chns/1". Photographs were non-stereo, providing for about 5% forward overlap for linking purposes only. An additional run at 25 chains per inch was also obtained for each job to test the usefulness of the larger scale.

Eight burns were covered totalling 123,000 acres and ranging from early to late burns, in Karri and Jarrah areas

Prior to field checking, a number of points on the photos were selected and interpreted as one of the four classes. These points were then located and the correct type recorded. A measure of reliability was therefore obtained and is listed below for the selected jobs.

Job	Forest Zone	Average Days Since Burn	% Correct
B 1	Jarrah	73	77
N 2	Jarrah	90	65
M 5	Karri	73	85
P 9	Karri	45	95

This measure of reliability agrees well with the general impression when interpreting the photos. i.e.

1. That the Karri zone is easier to interpret than the jarrah because the original dense and more vigorous vegetation provides better contrast.

2. Period since burning is important since much of the effect of burning is masked if there is too much recovery before photography.

The most difficult boundaries to differentiate are burnt and non burnt but it is usually only the position of the boundary which causes difficulty. Scorch is readily identified and it is only likely to be the definition of scorch which will cause errors. In the final interpretation an area was classified as scorched if more than 50% of the crown cover was scorched.

There did not appear to be any marked advantage in using the larger scale photos and certainly not enough to outweigh the much increased cost. Because the photographs obtained were close to 40 chains per inch, mapping of the type boundaries was done by direct transfer to a 40 scale trace of the burn. This was satisfactory in most areas which were well roaded. Once accustomed to the work it is expected that the average burn could be interpreted and mapped in two days.

The greatest obstacle to full scale use of the method is accurate navigation. The small format of 70 mm photos allows for little error if complete coverage is to be achieved. Flying at 10,000 feet and using the present beacon set-up, deviations of a half to one mile are not uncommon. Because the jobs are long distances apart a system independent of beacons will be the most satisfactory.

Infra-red film was chosen for trial because it was expected to have a number of advantages over normal colour.

(a) Normal healthy foliage reflects a high percentage of the invisible near infra-red radiation. Ektachrome infra-red film can therefore take most advantage of the type of change caused by burning.

(b) Near-infra-red radiation has good haze penetration. This permitted relatively high altitude photos to be taken without haze problems. This was particularly important at this time of year when haze is often quite severe.

The colours of the various types varies slightly from job to job but in general they are:

1. Not burnt - red scrub, red crowns.
2. Scrub burnt - blue underneath red crowns.
3. Scorched - crowns straw to brown colour.
4. Defoliated - blue throughout.

Tracks, recent cut-over jarrah, some earlier burns usually appear white.

The trial indicated that the method could be used satisfactorily in the Karri zone up to 2½ months after a burn but would probably need to be done within about one month in the Jarrah zone.

The cost of film and processing is about 0.05 cents per acre but to carry out the entire operation including flying time, share of availability cost, interpretation, mapping and checking the cost would be of the order of 0.9 cents per acre for complete coverage with 70 m.m. Considering all cost factors it is unlikely that rough sketch mapping from an aircraft could be done for much less.

LUPIN BAITING FOR Phytophthora cinnamoni

COLLECTION OF SAMPLES

by F. Batini

This note outlines the procedure used in the collection of samples for lupin baiting.

Equipment:

mattock
trowel
sampling bags (canvas or plastic)
tags
formalin solution (2%)
alcohol (70%)
water

Method:

Wash all mud off the sampling tools and then rinse these with formalin. Care must be taken that the formalin does not come in contact with either the eyes or the exposed skin. Sterilise hands with alcohol. Resterilise tools and hands between samples, but not between subsamples. Where it is impractical to obtain either formalin or alcohol, a thorough wash with water will be quite adequate.

Within the area to be sampled, any number of samples may be taken, but two or three will normally be adequate. For each sample, select five subsampling sites. Select in particular recently dead and dying Banksia, Persoonia, blackboy, zamia palms and emu bush (Podocarpus drouyiniana) close to the "green line". Thoroughly mix the soil near the base of these plants to a depth of six inches. Bag the root material and some of the soil, concentrating on the root material. Repeat at the other four sites and collect all the material into one bag. Collect the other samples in the same way. Moisten the soil in the bags, tie securely and attach a tag showing

a) date collected
b) location (approximate only)
c) sample number
d) stand condition (healthy, die-back)
e) host species (if only one species has been sampled).

Keep the samples reasonably cool, especially if plastic bags are used. Forward these to the research centres at Como or Manjimup at the earliest opportunity.

A REPORT ON BORONIA

(Summary of J.A. Thompson's Boronia Report, and notes by other Officers in the Southern Divisions).

Growth Habits Boronia megastigma

The plant germinates from seed in its natural habitat following scrub removal by fire. Boronia appears to germinate profusely under ideal conditions and forms a thick carpet of plants. These plants thin out as they get larger and other scrub becomes established and overtops the Boronia which gradually becomes choked out of the plant community. The cycle is repeated again following the next fire. Although the length of the cycle certainly varies on different sites carrying different scrub types, there is no doubt that Boronia megastigma is an initial coloniser of burnt swamp types over the majority of its range.

The plant flowers at an early stage 1 - 2 years following germination and by 3 - 4 years blossom is plentiful and seed readily available. The plants recover remarkably well from new shoots following the picking of branches for sprays, blossom or seed.

The plant is not hard to cultivate and can be grown quite readily from either seeds or cuttings. A commercial trial area of 10 acres at Collie is now being completely planted up with cuttings and seedlings.

Trade in Boronia (megastigma only)

Boronia megastigma is the native wildflower most sought after for commercial exploitation in the South West. It is used for blossom distillation, ornamental sprays and seed for sale purposes. This exploitation has quite a long history and is likely to continue. The quantities involved are in the order of

Blossom 5,000 lb. (approximately 1/3 Crown Land)
Sprays 11,000 lb. (approximately 1/10th Crown Land)
Seed 50 lb. (unknown Crown Land)

With quantities of the above order it is obviously not economic at any reasonable royalty rates to do any more than carry out the Forests Department responsibilities under the Native Flora Protection Act.

There are indications that picking has been carried out illegally on many reserves in the past and our present control is inadequate.

Suggested Control of Commercial Boronia Picking

1. Control of all Boronia megastigma produce on Crown Land should be by a Forest Produce License issued locally.

The following points should be considered:

1.1. The license issued over a specific area for a specific produce for a definite period, e.g. sprays, blossom or seed.

1.2. The area of the license to be limited e.g. one mile radius from a point on a plan.

1.3. Simultaneous operations should not be permitted.

1.4. A suitable deposit should be held and a suitable royalty rate fixed for each produce.

1.5. An accompanying return to be lodged for each license.

1.6. Initially more than one license can be held but this to be at the discretion of the O.I.C.

2. Permit Boronia picking on all Crown Lands except Flora and Fauna Reserves and National Parks, these to be closed to all commercial operations.

3. Set aside areas for Forests Department observations for both Boronia megastigma and Boronia heterophylla.

4. An arrangement is desirable for the W.A.G.R. to advise Forests Department of railway consignments, particularly of Boronia spray blossom for floral decorations which, as shown above, have grown to considerable proportions.

The proposals above are based on the following two points:

a. Regardless of what royalty and demand increases that take place in the future, it is highly unlikely that returns will equal administration costs.

b. In spite of the economics of the operations, the Forests Department should fully carry out its commitments as the administering authority of the Native Flora Protection Act.

Further Study of Boronia

Consideration should be given to the following aspects of Boronia:

i. The effects of spring and autumn burns on germination.

ii. The effective flowering life.

iii. Effective seed producing period.

iv. Longevity.

v. Investigation into the growth habits of Boronia heterophylla.

CONCLUSION

Present evidence is that no long-term damage result from fires, in fact burning appears to be advantageous to both seed germination and establishment in the absence of competition. A rotational burning system, with an autumn burn every 6 or 7 years to control the scrub competition appears most advantageous to Boronia survival and production.

Boronia regenerates well after stripping provided it is not uprooted, there is no evidence to show that picking threatens survival. However, any consideration of a rotational picking programme must be secondary to a consideration of a burning programme.

Boronia is a valuable asset and is well worth propagating. Some commercial companies are already trying to establish Boronia under cultivated conditions, and further consideration of this aspect is warranted if future demands are to be met.

THE KARRI FLORAL CYCLE

by P. Christensen

Last summer saw the dispersal of the remaining seed from the big seed crop of 1967 - 69. With the exception of Margaret River area it was considered that no districts had sufficient seed for successful regeneration burns this autumn.

Sampling this autumn revealed only one crop of any significance. This is the three year old crop currently flowering (May 1970). As was predicted in circulars sent to D.F.O.'s in the Karri regions last year and the year before, this crop is a mediocre one only. The flowering appears general although heavier in some parts than others. Thus if all goes well it should result in a mediocre seed crop in 1971/72. Regeneration burning may be possible in some areas in autumn 1971 and spring 1971/72 but it is unlikely that enough seed will be left in autumn 1972. It is felt that although the seed crop should be general throughout the Karri areas it may be too light in many places for successful regeneration burning.

A smallish crop which might have boosted the above crop was present last year as pin buds. As feared however, this appears to have aborted.

SPECIAL CASES

Flowering in the Walpole area appears to be very patchy and it is likely that certain areas will have no seed from this crop. This area remains the most variable part of the Karri forest and good predictions are difficult. In some parts the crop appears the same as for the main Karri areas but in others there is a smallish bud crop which could produce seed in 1974. The Margaret River area, although it appears similar to the main Karri areas, is also variable. In these two areas it is difficult to predict with any degree of certainty.

An area on Brockway Road in Poole Block, Quininup is of interest. A heavy bud crop was initiated this summer. Since there are no such crops in the surrounding areas it's thought that it might have been stimulated by the very hot fire which swept this area in 1968. It would be interesting to know if anyone has noticed this phenomenon in the past.

GENERAL

It is proposed to publish these forecasts each autumn in Forest Notes. Previously they were circulated to D.F.O.'s offices but appear not to have been generally available. The forecasts are based on data obtained from sampling done over most of the Karri forest area (see previous article on seed sampling in Forest Notes Vol. 7 No.2 of 1969). The present system of forecasts has only been

in use since autumn 1968 and there are many uncontrollable factors which may upset or alter such forecasts. However to date results have been encouraging and those that have taken advantage of them and left more trees per acre than otherwise normal in clear felled areas could be four years ahead with their regeneration burning programme. As mentioned above the next crop 1971/72 is likely to be a mediocre one only.

The capsules from this crop will still be ripening over next summer so it seems unlikely that the trees will have the necessary resources available to produce a heavy crop of buds before summer 1972. Since pin buds take four years to reach maturity as ripe capsules a good seed year cannot be expected before 1975/76. Even if the trees do bud heavily next summer the seed would not be available till 1974/75. However every second Karri seed crop is generally a good one so it is probable that this crop, whether in 1974/75 or 1975/76, will be a good one.

WEIGHT OF SOIL CARRIED BY DIFFERENT TYPES OF EQUIPMENT

by F. Batini and J. Cameron

Introduction

Work done by ADFO. S. Shea has clearly demonstrated that diseased soil can be readily transported for considerable distances on logging equipment. No data was available on the relative quantities carried by different types of equipment or on the patterns of spread. The trial described investigated these aspects which are of considerable importance to the hygiene logging programme.

Method

The tests were run on the following units

1. Caterpillar D7 Tractor
2. Caterpillar D4 Tractor
3. Michigan Tractor Shovel (fitted with fork lift arms).
4. Bedford 7 ton tip truck (one set of duals).
5. Chevrolet 15 cwt. ex Military Truck.
6. Short Wheelbase Land Rover.

The soils were wet loams in plantation areas not affected by P. cinnamomi. Each of the units was bogged in a wet creek crossing and was then walked or driven in second gear for ten chains along a gravelled road. A 50% sample (i.e. one track) of the soil falling on to the road between the starting point and 7½ chains was collected, air dried and weighed. At the 10 chain mark, any readily removable soil was collected into bins; the unit was then washed thoroughly using a heavy duty pumper and the soil removed by washing was collected onto a tarpaulin. This soil was then air dried and weighed.

All tests except for the Caterpillar D4 were run in the same location within the Mundaring Division. The test with the D7 was run at Dwellingup using the procedures described. The soil types at these two localities were analysed mechanically to test for comparability of sites.

Results

The weights of soil carried and dropped by the various types of equipment is shown in table 1.

Table 1

Weight of Soil (Air Dry) Carried by Different Types of Equipment

Unit	Approximate Soil Weight on Unit at Beginning (lbs.)	Soil Weight Lost Between 0 & 7½ Chains (lbs.)	Soil Weight on Unit at 10 Chains (lbs.)
Caterpillar D7	1629	172	1457
Caterpillar D4	697	357	340
Michigan Tractor	181	45	136
Bedford 7 Ton Truck	270	260	10
Chevrolet 15 cwt.Truck	26	19	7
Land Rover	12	3	9

The table shows marked differences between the units tested. At the 10 chain mark, relatively little soil remained on the rubber tyred units with the exception of the Michigan. In contrast large volumes of soil were retained on the tracked equipment. The D4, Bedford and D7 lost the greatest quantities of soil whilst travelling whereas the losses from the other units were relatively small by comparison.

The patterns of spread by the various units are shown graphically in Figure 1. Most of the soil which fell onto the road was lost quite rapidly (Table 2).

Table 2

Weight of Soil (Air Dry) Falling onto Road Within Specified Distances, as a Percentage of the Total Weight of Soil Falling Onto the Road.

Unit	Distance		
	0 - ½ Chain	½ - 1½ Chains	0 - 1½ Chains
Caterpillar D7	60%	12%	72%
Caterpillar D4	72%	15%	87%
Michigan Tractor	64%	17%	81%
Bedford 7 Ton Truck	33%	45%	78%
Chevrolet 15 cwt. Truck	43%	24%	67%
Land Rover	52%	24%	76%

Mechanical analysis of the Mundaring and Dwellingup soils indicated that both were loams.

Discussion

The data presented should be used to obtain trends rather than quoted as absolute values since factors such as soil type, soil moisture and road surface would markedly influence any results. Though care was taken in the sampling and washing process, some soil was inevitably lost. It is considered that these losses were not large and that they would not materially alter the trends obtained. The soil falling onto the road could be readily distinguished due to its colour and wetness and was readily handled excepting for the smallest particles. The units were washed at 10 chains so as not to interfere with the samples on the road. As the soil losses between 7½ and 10 chains were small, the calculated soil weights on the units at the beginning should be reasonably correct.

As P. cinnamomi may be readily recovered from soil samples weighing 3 to 4 ounces, the extremely large soil weights moved by these units constitute a real threat to any hygiene programme. The weights tabled are air dry equivalents and under normal operating conditions could be increased by 1/5 to 1/3 depending on the soil moisture content. This dead weight could in some cases affect machine performance.

Most of the soil which fell onto the road was lost within the first 1½ chains. In most instances, large clods were uncommon beyond 3 chains. The probability of P. cinnamomi initiating a new centre of infection is likely to be dependent both on soil weight

and on clod size. This indicates that the 2 to 3 chains wide strip adjoining the "green line" is most likely to become infected during cross travel, though new infections at 10 chains or beyond are still possible.

The proportion of soil lost to soil retained differed greatly between units. This is a function of a number of factors e.g. rubber tyred vs. tracked, travelling speed, road quality and vehicle construction. The differences observed between the D4 and the D7 are probably due to the D7's longer track base and heavier weight which reduce jolting. The general construction of the D7 provides a number of wide flat surfaces very suitable for retaining soil. Of the rubber tyred units, the Michigan tractor and Land Rover were atypical in the amounts of soil retained. In the former, a large mound of soil was held on the large flat towbar frame. In the latter, most of the soil was retained on the sump protection plate. Both of these attachments were fitted at Departmental Workshops. The two trucks were relatively efficient at self cleaning.

The soil retained on the units constitutes a further source of new infections. The efficiency of this source is highly dependent on its subsequent treatment. If the soil dries thoroughly "in situ", the survival of P. cinnamomi will be severely reduced. If however, the unwashed unit is rapidly transferred to a new area on a low loader, long range spread of P. cinnamomi to a previously healthy area is possible.

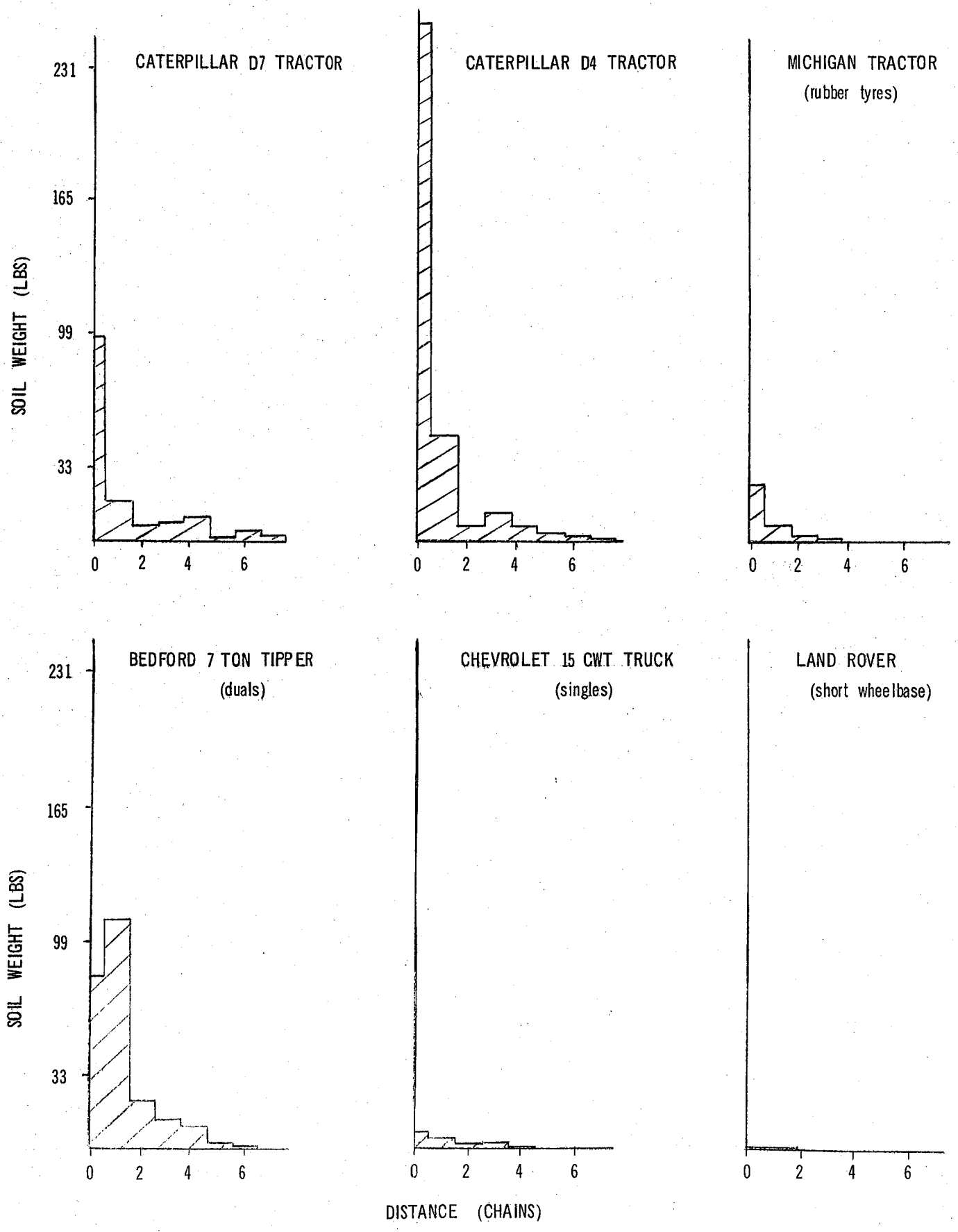
Conclusion

All types of equipment tested are capable of transporting diseased soil for considerable distances. Potential for new infections varies greatly between units. The D4, Bedford with duals and D7 are the most efficient units for spread of diseased soil over short distances. The D7 and D4 have the greatest potential for spread over longer distances. The large soil weights involved indicate that segregated logging operations and the elimination of cross-travel from diseased into healthy areas are essential if the artificial spread of P. cinnamomi is to be reduced to a minimum.

Acknowledgements

We would like to thank ADFO Kelers, DFO Robley, F.O. Brierley and A/F Cave for their assistance with this project.

WEIGHT OF SOIL DROPPED OVER 7½ CHAINS BY DIFFERENT TYPES OF EQUIPMENT



THE "WILD" PRISMATIC SQUARE

by Alan Cooper

There are many instruments which help the Forest Officer when carrying out survey work in the Department, one of the simplest and smallest of these being the "wild" prismatic square, which, despite its simplicity, lends itself to many phases of survey work. The prismatic square comes in the forms of single prism and double prism.

The instruments are as small as a hen's egg and fit easily into the pocket whilst for the service it renders, it is quite inexpensive being only about $22.00 retail for the double prism and even less for the single.

Throughout the years many instruments have been designed to carry out some of the work that this instrument will do. Their shapes and sizes have made them rather unwieldy. These devices have, in turn, consisted of plumb lines, eyelets, sight vanes, slits, mirrors and finally prisms. Mirrors tarnish quickly and must be absolutely flat and precisely set in their mountings. By reason of these facts they do not lend themselves to field work - any small deviation from true immediately giving a source of error. The magnetic compass is subject to attraction and the misreading of degrees is a further error of which to beware. In the "wild" prismatic square the single prism deviates the observed ray through 90° to right or left according to which of the two faces through which the observation is made. The double prism has two super-posed prisms which deviate the observed rays through 90° one to the right and one to the left. The two right angles together then form an angle of 180°. The angle of deviation of the prisms is constant at all times for the instrument and as they are fixed in their mountings no setting is necessary, which fact makes them ready, at any time, for use.

Approximately 12 months ago the double prism was acquired by the Wanneroo Division and much use of it has been made in the subdivision of planting areas for pine. Not only does it enable the officer to quickly mark out right angles for the pegging of fire breaks and cross tracks but by using the rectangular co-ordinate system he can carry out the survey of an irregular area.

By using both the prisms to give the 180° angle the officer is enabled to place himself in a straight line between two given points.

With the use of the single prismatic square and a plumb line suspended from the threaded portion of the instrument it is possible to take levels to within an accuracy of approximately 2 cm in 50 m. The square is held horizontally, with one of its faces towards the ground and the observer sights into the other face. To the observer the image of the plumb line appears horizontal acting as a reticle. Observing through the direct view finder the user has only then to read the figure on the surveyors staff in line with the reticle. This operation would be of more benefit in building or earth levelling works and has not yet been used in the Wanneroo Division.

When not in use the instrument screws down into its cover saving it from the likelihood of any damage. Unlike cross heads, the magnetic compass and other home made devices the instrument will indicate perfect right angles even when not absolutely motionless or held exactly in line of sight, thus dispensing with the use of tripods. Thanks to its small size and the fact that it can be carried in the pocket it is ideal for spot checks with an accuracy in the vicinity of one minute.

MOONDYNE JOE OUTWITS SOME VILLAINS

by J. Williamson

Moondyne Joe was Western Australia's only bushranger and there have been many stories about him, but this is the first one I have come across which concerns the timber industry.

About 1890 Moondyne Joe went to Karridale and became a respected member of the community living and working at the mill built in 1884 by M.C. Davies. This was Davies' second mill, and cut 20 loads a day. His first one at Coodardup 4 miles from Karridale cut 15 loads a day, but closed down in 1884. The fine stand of relatively even aged Karri in the Karridale area to-day is the result of the early cutting for these mills.

Anyhow, to get back to Moondyne Joe who worked first as a labourer and then as a rough carpenter for Davies at Karridale. At that time the W.A. Jarrah Company at Busselton was also in operation, and very keen rivalry existed between them and Davies. The story goes that the Busselton people, determined once and for all to try and damage their rival, sent men with a dray with orders to select the worst logs they could find, saw sections out of them, and bring them back to Busselton to exhibit to the timber buyers. Moondyne Joe got wind of the plot and, unknown to anyone, followed up the tracks of the Jarrah Company's men, and as they moved through the bush, sawing a section here and a section there, with the idea of picking them up on the return trip, he took all the sections and hid them, then hurried back to where the dray was waiting.

When the sawyers returned for the sawn sections they soon discovered that someone was wise to their plot, and realised that they had better get away while the going was good. They reached the dray, jumped in and whipped up the horse, but out they fell in a heap as the dray collapsed. Moondyne Joe had sawn every spoke through to within a quarter of an inch. Mr. Davies was never troubled by his rivals again.

EFFECT OF Phytophthora cinnamomi ON THE WOOD QUALITY OF E. marginata

by F. Batini

Recent discussions with timber merchants indicate that some London buyers are concerned that jarrah timber may be diseased. This obviously refers to jarrah dieback and the associated fungal pathogen P. cinnamomi. It is probably due to the well known fact that SOME fungal species are known to affect the strength and durability of timber either in the tree or in service.

The cell walls of the secondary xylem are composed primarily of celluloses, hemicelluloses and lignin. Lignin is the most enduring of plant tissues and is decomposed only by a comparatively small number of fungal species. These are found chiefly amongst the higher Basidiomycetes and examples such as Polyporus australiensis and Polyporus eucalyptorum are well known to West Australian foresters.

In contrast, lignin decomposition is unknown and cellulose decomposition is uncharacteristic in the Phycomycetes. P. cinnamomi is classified in this rather more primitive group of fungi, whose substrates are limited to the sugars and the simpler carbon compounds. These compounds are found primarily in the regions of high metabolic activity (e.g. the root tips) and in storage tissues (eg. parenchyma). This probably explains why P. cinnamomi has never yet been recovered from jarrah roots greater than ¼ inch in diameter. Wood samples taken from dead, affected and healthy trees have been forwarded to C.S.I.R.O. Forest Products. The results indicate that the radial and tangential cleavage strength of both green and dry samples was not affected.

It is considered most unlikely that P. cinnamomi (per se) could have any deleterious effects on the strength or durability of jarrah timber. Checks and splits will occur in dead trees if salvage is delayed, but this degrade is the result of drying and of subsequent tension stresses.

It is important to discredit any suggestion that jarrah timber is diseased before any permanent damage to the export or local market occurs. It is suggested that A.S.T.M. and the Forests Department should approach C.S.I.R.O. Forest Products with a view to publishing an informative bulletin on this aspect of jarrah dieback.

BATTLE OF THE GIANTS

by R.J. Underwood

Three of the tallest tree species in the world are growing in adjacent plots in the new Pemberton D.H.Q. Arboretum. They are Karri (Eucalyptus diversicolor) of Western Australia, Mountain Ash (E. regnans) of Victoria and Tasmania, and the Redwood (Sequoia sempervirens) of Northern California.

It is interesting to compare the early development of the best trees in each plot.

The arboretum is located on a re-purchased farm roughly ½ mile north of the Settlement. Karri and Karri-marri stands once occupied the site. The soil type is typical "Karri Loam".

The Karri plot, consisting of only 15 trees, was established in 1964 as a trial of the laughable "Tunisian Wildling" method. This technique, described by two visiting foresters from Tunisia, consists of stripping all the shoots and roots from a wild seedling and planting the naked stump. The Mountain Ash and Redwood were planted in 1965 using tubed stock raised in the Manjimup Nursery.

Heights of the dominants (5 tallest trees in each plot) were measured with height sticks in March 1970.

Details are:

Species	Year of Planting	Stock	Mean Ht. of Dominants
E. regnans	1965	1-0 nursery seedlings	38'0
E. diversicolor	1964	"Tunisian" Wildlings	35'0
S. sempervirens	1965	1-0 nursery seedlings	4'6

The clear early superiority of the Eucalypts is not unexpected, but the remarkable performance of the mutilated karri wildlings is pleasing to note. A belated apology to the Chief Silviculturalist of the Tunisian Forests Department is undoubtedly called for. The growth rate of the Regnans (roughly 8' in height per year) is excellent and indicates potential for this species for further trial plantings on karri sites.

QUOTABLE QUOTE

Working in a sawmill is not everyone's idea of Utopia, but isn't quite as bad as the following true yarn makes it out to be.

Two blokes were working on the area where the Dwellingup Forestry Mill was to be rebuilt after the big fire.

Said one to the other: "I wonder how big it will be when its finished?"

Replied the other: "Well, I heard that when its working to full captivity, it'll hold 13 blokes!"

(submitted by J.S. Evans.)

ASSESSING JARRAH FOREST STOCKING BY SEQUENTIAL SAMPLING

by M.C. Mason

INTRODUCTION

Sequential sample lines have been used in assessing jarrah forest areas in the Dwellingup division recently to ascertain the present stocking, and what treatments to apply to increase stocking and productivity.

The areas sampled to date can be put into two groups. Areas of 50 percent canopy, and areas of 40 percent canopy cover, as classified on A.P.I. plans. The areas with over 50 percent total canopy cover are assumed to be well stocked. However, they will also be checked by sampling in the future. The information collected will enable more accurate estimates, and costings to be made for the necessary operations required.

The procedure employed in this sampling method is outlined below:

1. Lines are selected in the office and are restricted to the A.P.I. type being assessed. Where the shape of the area allows, the line is plotted across the contours. The line may be divided into sections if necessary. To obtain plot distances the length of the line is divided by the maximum 100 plots, i.e. 1500 yds ÷ 100 plots = 15 yds. This figure is the distance from the start of one plot, to the start of the next. By subtracting the plot length, (9 yds.) from the distance between start points of plots, the distance between plots is obtained. In this case the distance is (15 yds. - 9 yds.) = 6 yds. The desirable minimum distance between plots being 5 yds. (this is not always possible). The area being sampled can be any size considered necessary.

2. Two men are required for the field work, one being the recorder, and the other as compass man.

   To obtain the plot size a tape is run out to 9 yds., this is then tied to the compass man, and held at the other end by the person recording. The distance between plots is paced by the compass man, who marks the start of each plot, before walking on. When the tape is taut the plot is assessed either to the left or right of the line, the side chosen for assessing is constant throughout the line.

3. Assessment of stocking is done optically, though where necessary the tape is used, i.e. for trees that are too close to the plot edge for accurate optical assessment. This is not usually necessary.

4. - Recording of data is done on a graph which has an elliptical line marked on it. Points representing stocking levels at 5% intervals are marked on this line. (See figure 1). Plotting is done with symbols placed on the intersections of the graph squares. The plots that are unstocked are recorded on the next intersection across the graph, and stocked plots are recorded across one and up one. So that unstocked plots would give a line across, but as soon as a stocked plot was recorded the line would rise at 45 degrees on the graph. (see figure 2).

In addition to recording stocked plots, notes are made on the number of veteran marri and jarrah, banksias, sheoak and blackboys in the area. Suggested treatments are recorded at the time, to aid in the final drawing up of a prescription for the area.

Due to the minimum use of figures and the direct recording of data onto the graph, the margin of error is greatly reduced.

The symbols employed on the graph are:--

			Required Number Per Plot
Piles 45-90 inches	recorded by girth in feet	5'	one with vigorous crown + 20 foot defect free bole
Poles 16-44 inches	recorded by the letter	P	two
Sapling 10 ft. plus (height)	recorded by the letter	S	two
Large advance growth	recorded by the letter	R	seven - with 5 stocks
Small advance growth	recorded by the letter	O	ten fully established
Unstocked plots		X	

Where one pole or one sapling scours in a plot, and is accompanied by at least three large advance growths, the plot is then considered stocked and is recorded thus - R^S = regrowth sapling, or R^P = regrowth pole. $_tP$lots containing poles which require thinning are recorded - ^tP.

Saplings, poles, and piles must be free of fire damage to the bole, for them to contribute to the stocking of a plot. When areas of fire-damaged stems are traversed, a note to this effect is made on the graph.

Trees over 90" gbh are considered mature and are noted for trade cutting.

The results from the sample lines done to date are of interest only to the Dwellingup division. Of more general interest is the time spent on each phase of the sampling.

The areas for sampling are already selected, so this does not effect the time allowed for different phases. The percentages quoted are based on one eight hour day for 2 men. The average 250 plots per day, is used as a base for the following figures.

(1) The plotting of lines, and making notes on, line length, A.P.I. type, plot interval, and the 6 figure reference on starting point. Average of 8 percent.

(2) The field work, assessing plots, if the described practise is followed, would require 75 percent of time.

(3) Plotting the lines permanently on the map and summarising of data collected, is done in the office. This usually requires 8 percent.

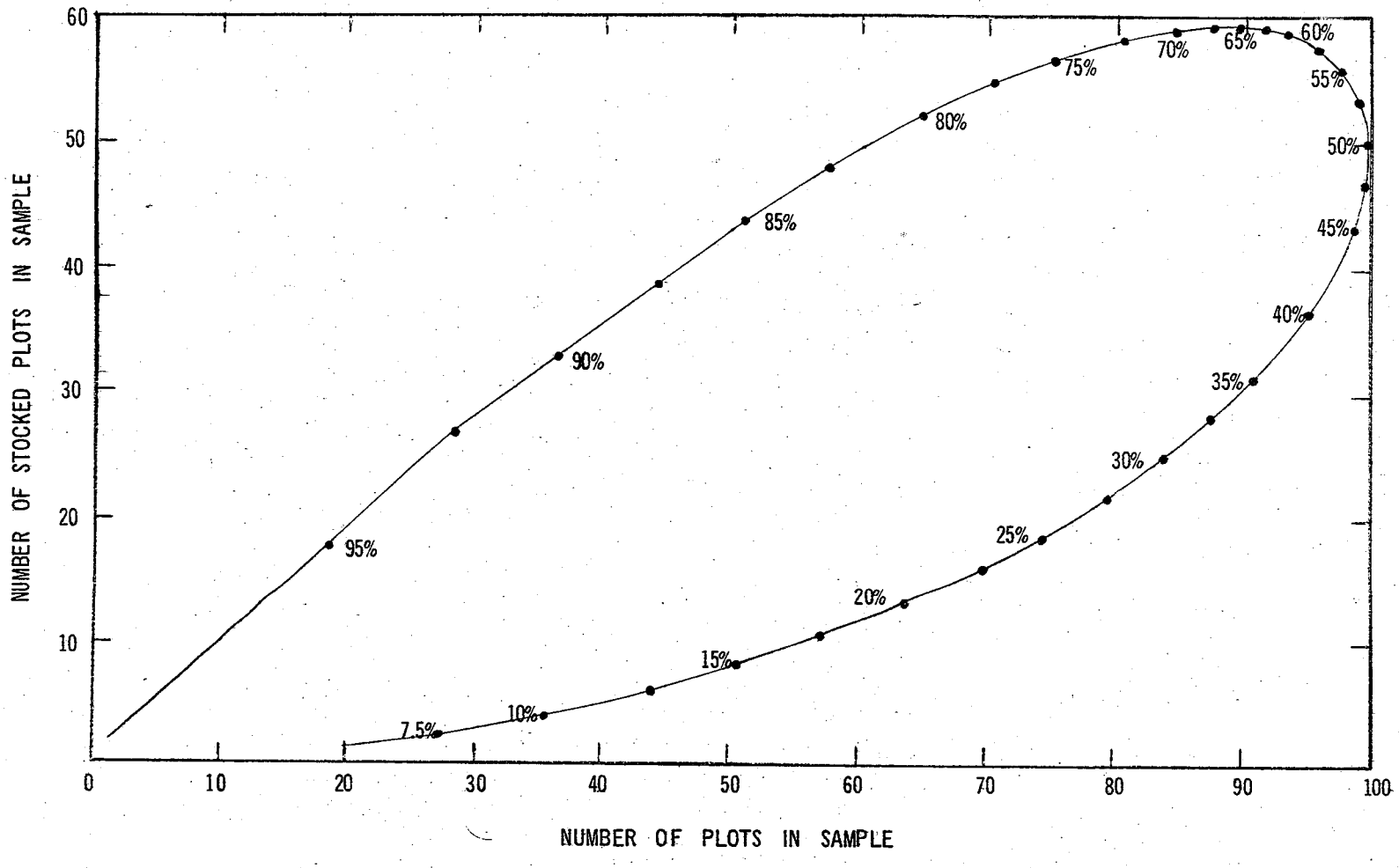
(4) The remaining 9 percent is spent travelling and locating start points.

Office	16
Travel	9
Field	75
	100%

The final formulation of a treatment prescription, for the understocked areas from the sample, is done by a senior officer.

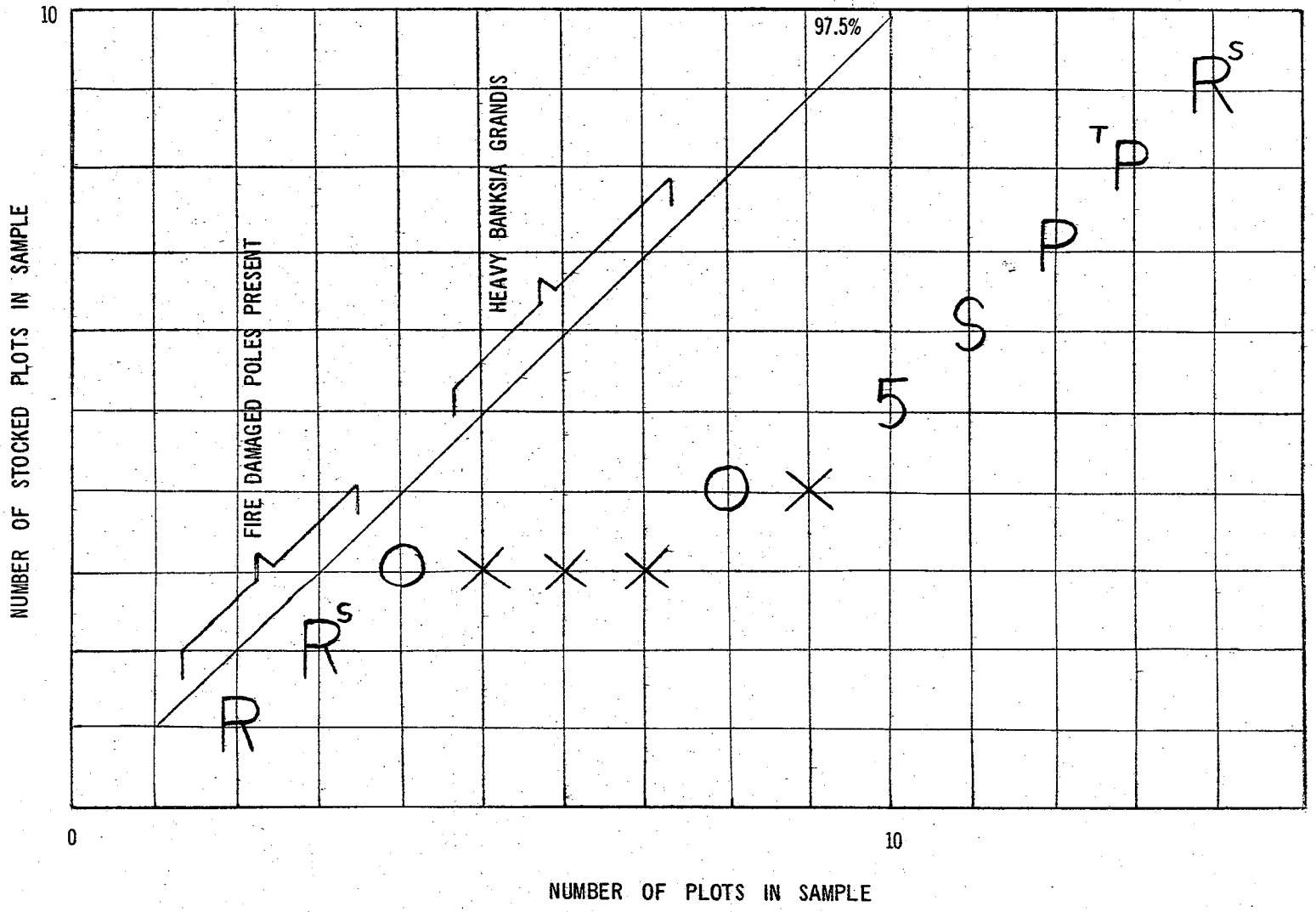
SEQUENTIAL STOCKED – QUADRAT TALLY

FIG 1



ENLARGED PORTION OF GRAPH SHOWING TALLY OF STOCKING

FIG 2



NOTES ON INLAND ARBORETA TREE PLOTS

by A.J. Hart

This report attempts to outline in some detail for the benefit of readers, what was attempted and what has been achieved, mainly under two Working Plans 7/59 and 10/58. The period since recognized inauguration of the Inland Arboreta is now 11 - 12 years.

HISTORICAL

Although the W.P's indicate initiation in 1958 and 1959, much work had been commenced before this date and goes back to around 1951-52 with plots being established at Yuna, with Dr. Teakle's co-operation and also at Wongan Hills on areas of salt land with the co-operation of the Department of Agriculture. A plan of location of plots including some now abandoned is attached for general interest for those who may care to visit the more accessible ones.

(A) W.P. 7/59 - SOIL MOISTURE DETERMINATIONS

AIM to determine relationship between moisture content of the soil and tree growth.

OFFICER IN CHARGE D.H. Perry
Associated Personnel G.E. Brockway. Advice and direction.

Date of Inauguration August 1959.

Location

Eneabba - No.1 Plot (North Plot)
Mendels - No.1 Plot (Everett Birche's Property)
Morawa - No.1 Plot (Sandplain Plot)

SCOPE OF INVESTIGATION Field determinations will be made of the soil moisture content of the "A" and "B" horizons down to "C" horizon using a "Speedy" moisture meter. The "C" horizons of Arboreta listed are practically impenetrable to the tree roots. The "B" horizon will be sampled at the point where it rests on the "C" horizon. It is thus hoped to estimate the amount of soil moisture available to the trees on each site at various times of the year and relate this to the growth pattern of the trees.

TREATMENT Treatments will be as follows:-

1. Grass Growth
2. Tree Growth
3. Indigenous Scrub
4. Cultivation

PROCEDURE As each of the Arboreta plots is bounded by a pasture paddock these will be used as control. The soil profile will be sampled at a point about 3.00 chains from the plot to ensure that the tree roots have not invaded the site. Each site will be sampled at 5 points and each profile will be sampled 3 times as follows:--

1. Complete "A" horizon.
2. Approximately half way between the bottom of "A" horizon and the "C" horizon.
3. At a point immediately above the "C" horizon.

Each of the five surface samples taken from each site will be placed in a sealed jar and then later mixed and tested with the "Speedy". Three tests for each lot are proposed. This procedure will be carried out for each of the soil horizons on each site.

The Arboreta soils will be sampled four times a year as follows:--

About August 31st	Maximum moisture
About Nov. 30th	
About Feb. 27th	
About April 30th	Minimum moisture

It was noted at that time that disorders had developed in Arboreta trees after several years of healthy growth indicating that soil moisture is a major factor governing tree growth in drier areas. This project is designed to provide positive information on this matter. Some modification of procedure and extension of the investigation may be necessary as time goes by.

Soil moistures were sampled regularly for a period from 9/9/59 to 9/12/66.

At this stage it was felt that a review of the W.P. was necessary to assess success or otherwise in relation to the aim of the W.P.

Conclusions reached in a report on this W.P. of April 1967 indicate the following main points and findings.

1. PINUS HALEPENSIS Growth at Heitman's plot Morawa exerts a stabilizing effect on soil moisture in the "B" and "C" horizons (i.e. 5" - 24" and 25" - 35" +) which is upset when heavy rain occurs and causes increases of up to 14% in soil moisture at the "C" horizon. This effect may or may not occur under any other tree plot when development of trees is such as to use all available moisture.

Trees have always appeared thrifty and no deaths have occurred in recent years.

2. Removal of natural vegetation at Eneabba and introduction of agricultural practices has created a reservoir of moisture in the soil horizon at or below 3' which fluctuates in amount with rainfall but are always fairly high compared to tree plots. The fluctuation in moisture is considered detrimental to maintenance of good soil fertility from this point of view of surface accumulation of surplus salts.

3. Pasture plot moisture regimes resemble tree plot conditions most closely, possibly through grass growth using up surplus moisture at the end of each winter and spring and retaining periodic summer rain by way of surface mulching effects.

4. The contention that trees deprive neighbouring fields of soil moisture does not seem to be true except in relation to areas immediately adjacent to trees: this distance from a tree edge is considered dependent on the type of soil, aspect and tree species concerned and is probably about 1½ times the width of the crown in extent.

5. Soil moisture has been sufficient to maintain a growth rate of approximately 2' per annum of height growth at North Eneabba in Euc. cladocalyx at 33' spacing and approximately 1.5' per annum in Pinus halepensis at Morawa at 15' spacing. Rainfall at these localities is regarded at present as being 27" and 15" respectively.

6. The amount of soil moisture is related directly to the rainfall for the corresponding preceding period of about 4 - 5 months.

7. The natural sandplain vegetation is capable of withstanding severe moisture stress for prolonged periods (up to 4 - 5 months) suggesting possibly a state of virtual complete growth dormancy. How this is achieved is not known.

8. Clearing of natural sandplain vegetation and re-establishment of trees at a spacing at 33' has not as yet resulted in soil moisture stresses such as experienced under natural vegetation. The recent drought, being one of the most severe in the past 30 years, provided an opportunity for testing soil moisture after an annual rainfall of approx. 11" (normally 27"). Cyclone "Ingrid" deposited approximately 3" of rainfall about 3 weeks before sampling and had evidently helped to replenish soil moisture. This indicates the porous nature of surface soils down to the hard impervious clay layer which underlays this area and the small amount of rain required to restore a reasonable level of moisture.

These investigations would show better results if used in conjunction with a dendrometer to correlate moisture levels and growth trends over a period. They have however, indicated a reservoir of soil moisture on cleared sandplain which could possibly be utilised by a deep-rooted perennial grass at suitable stockings. South African Veldt Grass could possibly be suitable and a small quantity has been sent to an interested party at North Eneabba subsequent to these tests.

It has been recommended that measurements be continued for another 5 years at North Eneabba by which time soil moisture should be causing stress in tree growth which is basically what it was aimed to determine and how this affects tree growth. As seen at Morawa in Pinus halepensis, these trees have maintained a fairly constant 1.5' height growth per annum to the present time, over an 18 year period. No disorders have yet been observed in this species.

However, Euc. occidentalis at the last inspection, had exhibited at least 1 death. Other losses in this species were seen elsewhere and it is anticipated that suitability of this species will need drastic revision as a result of the recent drought.

The manner in which Pinus halepensis and sandplain vegetation is able to withstand low soil moisture levels for prolonged periods is one of continued intrigue.

(B) W.P. 10/58 SEMI ARID AND ARID COUNTRY ARBORETA

AIM OF THE EXPERIMENT To collect all the available data possible on the trees and plants which can be grown in these regions with particular attention to relating species to rainfall and soil type.

Date of Inauguration 1st April 1958

SCOPE OF INVESTIGATION The arboreta listed below have been established for some years and many are now considered abandoned for research purposes.

*Moora	...	Road Board
Mingenew (2)	...	Geraldton Road Eregulla Springs
Morawa	...	J. Heitman's Property
Mendels	...	E. Birch's Property
*Yuna	...	R. Warr's Property
Wongan Hills	...	Research Station
*Jennacubbine	...	Mrs. Clarke's Property
Southern Cross	...	Forests Reserve East of Town
*Bruce Rock	...	Recreation Ground
*Newdegate	...	Pilot Farm.Agriculture Dept.
Dryandra	...	Forest Settlement.

(*No longer used for research purposes)

It is now intended to initiate the following studies of the aboreta listed:-

1. Prepare an accurate plan of each plot giving the exact location of each tree and its name. Dead trees will be included.

2. Carry out a soil survey of each plot and prepare a soil map. Collect soil samples for analyses and make one eighth scale soil profile models for the main soil types.

3. Make a contour map of each plot using 2'6" contours.

4. Collect soil samples in April of some years for moisture determinations. To collect such data and information as is possible relating to the moisture requirements of tree species under test.

5. To determine suitable espacement distances for various species and soil types.

6. Write up a complete history of each plot, the heights attained to that date by each individual including the heights of dead trees and the date of their death. Clearing, soil preparation, pasture, fertilisers, subsequent tending.

7. Obtain rainfall data for the nearest weather station to the arboretum commencing with the year the trees were planted.

PROGRESS RESULTS AS AT APRIL 1969

Conclusions reached to that date extracted from a report of 29th April, 1970 are as follows:--

1. Tree establishment in rural and wheatbelt areas of rainfall as low as 11" per annum has been proven, with good prospects of establishment to 8" rainfall per annum.

2. The list of recommended species as provided in the Department Catalogue has been extended following establishment of the plots.

3. A recommended list of species for inland areas where plots are established has been drawn up and already submitted to H.O. This covers various types of rainfall also.

4. In association with W.P. 7/59 it is inferred that tree growth exerts a stabilizing influence on soil moisture movements in the soil profile and thereby mitigates and assists in preventing soil surface accumulation of salts and also in reclamation of land affected by salt in like fashion, although other remedial measures are required in conjunction with tree plantings and pasture to recover or be re-established.

5. Together with W.P. 7/59, tree growth does not appear to encroach to a great extent on soil moisture in neighbouring fields as evidenced by soil moisture graphs of W.P. 7/59. Rainfall has an important influence on this encroachment obviously. Generally, this is contrary to popular conception in this context and the lack of the vegetation is considered in part due to toxic effects of large concentrations of tanin from trees, as well as moisture removal.

6. From the recommended lists of species it is possible to select species for a variety of purposes, tall medium or low height windbreaks, as well as decorative and ornamental purposes over a wide range of soils and rainfall. The comment made in the progress report of December 1959 bears reiteration, "in view of the huge areas of light land now being farmed the need to provide trees on this country where nature grew none, is a pressing one".

7. From observations made, it is considered the use of Tamarix sp. for salt land reclamation is not entirely justified. Growth rates are low; the best being approximately 2' per year and this on montemorillonite soils and Coastal loams, to which they seem uniquely adapted in inland soils. There use as sheep fodder is poor, as better quantities could be available from faster growing Euc. species which as per (4) above show definite proof of some re-establishment of soil moisture stabilisation.(Gunyide plot).

8. Overall results have indicated that most successful establishment figures have been obtained where regular maintenance to remove competition and pest refuges has been carried out.

GENERAL

1. To assess the success or otherwise of this experiment in relation to species suitable for planting from those originally selected, all plots were analysed using a classification into 5 classes viz:-

A.B.C. and D. These were 4 arbitrary classes of relative thrift, vigour, and associated height growth of the species concerned: the 5th class recorded deaths. The basic criteria used in assessing stock in plots was uniformity of specimens present for assessment. Results of this assessment are shown in the table below and represent a break down of 5,261 observations.

CLASSIFICATION OF TREES IN PLOTS ACCORDING TO THRIFT, HEIGHT UNIFORMITY AND VIGOUR

Classification	Percentage of Stock
A	84.00
B	8.30
C	2.30
D	0.90
Losses	4.50
Total	100%

This table is shown for brevity, as a table of plots surveyed in this way is lengthy and confusing.

2. Because of the severity of the recent drought, considered to be the worst for 30 years, a unique opportunity presented itself for checking the drought resistance of species already planted. It is intended to check this during 1970.

(C) W.P. 7/67 SALT LAND PLANTINGS

AIM i. To assess suitability of different Eucalypt species for planting in salt-affected land.

ii. Suitability of placement of species in salt-affected land in relation to topography and salt land occurrence.

iii. To assess amelioration of salting process by trees planted.

Main Species Used to Date Have Been:--

1. Euc. sargenti - salt river gum.
2. Euc. spathulata - Swamp Mallet.
3. Euc. camaldulensis - River gum.
4. Euc. kondinensis - stocking gum.
5. Euc. cladocalyx nana - Dwarf Sugar gum.
6. Platypus heterophylla (Euc.) - Coastal Moort.
7. Tamarix aphylla - Athal tree.
8. Euc. planchoniana - Bastard Tallow wood.

To date Numbers 1, 2, 3, 6 and 7 have shown good tolerance particularly 6 (Euc. platypus heterophylla) with a rapid rate of growth.

Plantings made with these species were replicated, in part, at both Avondale and Wongan Hills Agricultural Research Stations.

Two types of stock have been used to date, normal potted stock and stock grown in long plastic tubes and bags in an endeavour to place roots of the seedlings below the high salt concentrations. The levels of salt encountered are shown in Table 4 along with growth rates per annum of species at present under test with survival %'s and numbers.

This trial has demonstrated that the use of Tamarix aphylla on salt areas does not normally give rapid rate of growth - as mentioned earlier, this species seems more suitable to coastal limestone, sandy loams and montmorillonite soils. The surprising aspect of this trial has been the success of River gums and Coastal Moort, but then this fact was plain for all to see in many places, as it naturally inhabits brackish water courses and near the sea fronts respectively.

Whilst not wishing to be optimistic it is felt that were adequate plantings made with the faster growing Eucalypts, along the edge of salt areas, some reclamation could be achieved in reasonable time and at least contain the spread of such areas. This belief is based on the result of soil tests and an appreciation of the way in which this problem arises in relation to soil moisture. It is also worth noting that it is considered ill-advised to remove natural vegetation from along water courses and natural drainage channels because of the likelihood that surface salting will ensue with consequent loss of utility.

The list of species included here is by no means exhaustive of those known to be resistant to salt; rather it is the aim to test Eucalypts because of faster growth and ease of establishment with prospects of natural regeneration when established.

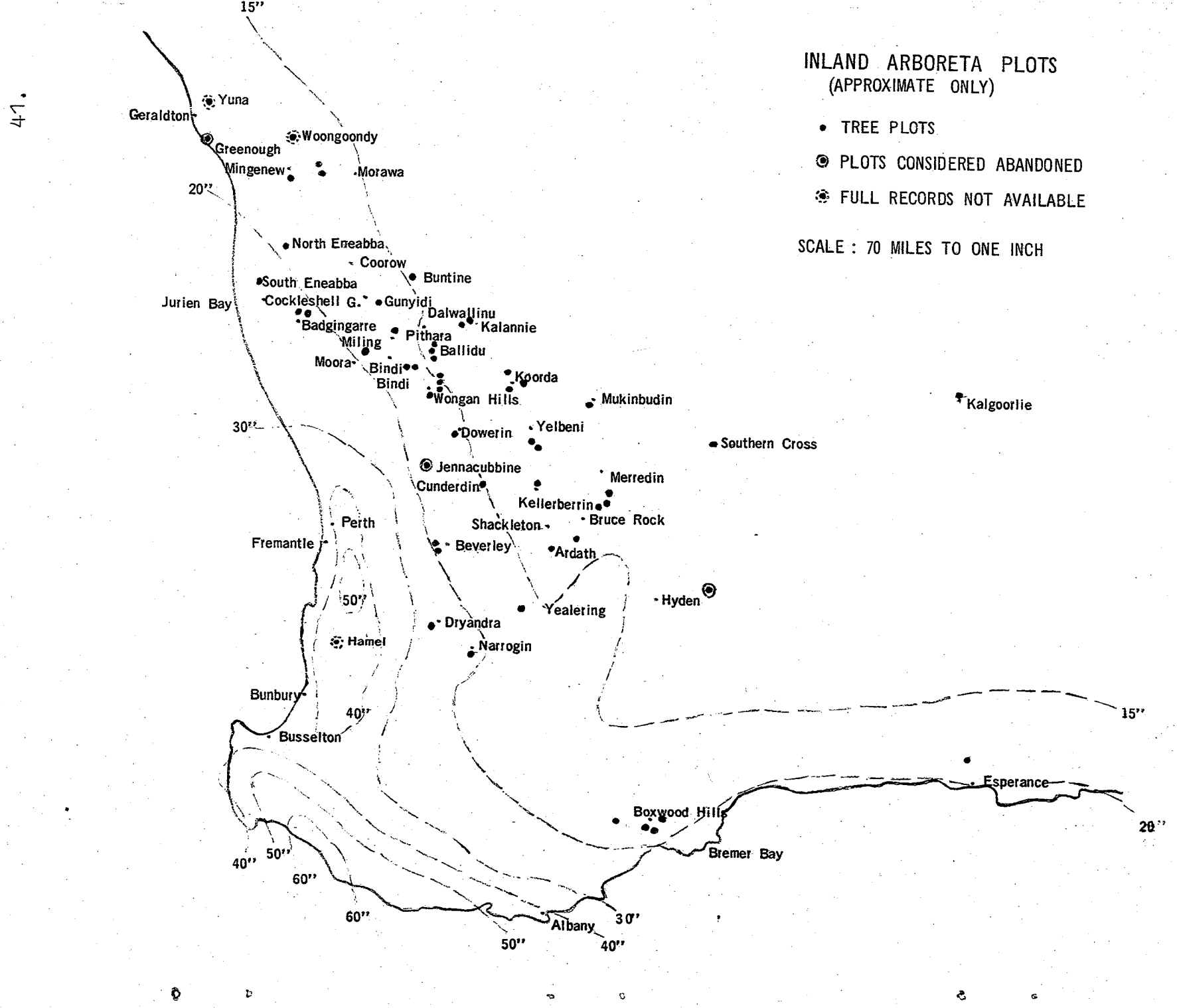
If any reader is interested in any particular aspect of these experiments please contact the writer.

FUTURE ACTION: Because of the outstanding success of plantings with River Gums, a new W.P. 28/68 has been implemented to test various provenances of River gums collected throughout Australia and one from Zanzibar for resistance to insect attack primarily. This Working Plan calls for establishment of 373 seedlings of the 11 provenances in six of the already established tree plots throughout the wheatbelt.

The provenances to be tested are summarised briefly in Table 3. Three of these are currently being tested in West Pakistan by Quadri.

It is also intended to test plastic mesh tree guards during this trial. Observations to date indicate considerable damage through not removing guards, the main damage being constriction of root and branches causing fracture under wind pressures. These are necessary in early stages of growth because of rabbit attack.

Information is still being obtained from the salt land plantings and further attention will be given to this aspect of species tolerance as opportunity offers.


INLAND ARBORETA PLOTS
(APPROXIMATE ONLY)
• TREE PLOTS
PLOTS CONSIDERED ABANDONED
FULL RECORDS NOT AVAILABLE
SCALE : 70 MILES TO ONE INCH
15"
20"
30"
40"
50"
60"
Yuna
Geraldton
Greenough
Woongoondy
Mingenew
Morawa
North Eneabba
Coorow
Buntine
South Eneabba
Jurien Bay
Cockleshell G.
Gunyidi
Dalwallinu
Kalannie
Badgingarre
Pithara
Miling
Ballidu
Moora
Bindi
Bindi
Koorda
Wongan Hills
Mukinbudin
Kalgoorlie
Dowerin
Yelbeni
Southern Cross
Jennacubbine
Cunderdin
Merredin
Kellerberrin
Bruce Rock
Shackleton
Perth
Fremantle
Beverley
Ardath
Hyden
Yealering
Dryandra
Narrogin
Hamel
Bunbury
Busselton
Esperance
Boxwood Hills
Bremer Bay
Albany

BILLY FIRE PATROLS IN COLLIE PLANTATIONS

by J.S. Evans

Patrols of the waters edge around Pinus radiata plantations adjacent to the Wellington Dam were instituted in the late spring of 1968, following increased usage of the above areas by members of the public on marron party excursions.

Because most people prefer to cook their marron as soon as they have finished catching them the risk of billy fires spreading to nearby plantations is high.

Plantations involved were Mungalup (638 acres, with 3 miles of pines bordering the water) and Bussell's Brook (2412 acres, with 7 miles of shoreline).

Efforts have been made in the past to provide fireplaces in suitable cleared areas for public use and signs have been erected indicating their position and requesting co-operation in the use of fires.

Patrols last fire season were carried out as weather conditions dictated, in two different ways.

1. Patrols by officers in the evenings travelling in pairs looking for and checking fires lit in such positions that they could have been a threat to nearby plantations.

   Tactful approaches were made to the public in some circumstances informing them of the danger of fires in these areas and their correct use.

2. Patrols by wages staff on weekends, during the early mornings when the hazard was expected to be high the same day.

   During weekdays when weather conditions were extreme a routine check of the water line was made by the gang normally assigned to that plantation.

As an indication of the number of fires found adjacent to Bussell's Plantation for the past two years, in the 1968-69 fire season 53 fires were found of which 24 were potentially dangerous and in the 1969-70 fire season 55 fires were found of which 22 were dangerous.

A most indispensable item used by this patrol was an ordinary plastic bucket with which water from the weir was used to douse the fires.

Official instructions have now been received from the Fire Control Superintendent advising officers as to the means of approach, dress to be worn and transport etc.

A handout pamphlet has been prepared for issue to the public when necessary:--

"Camp Fires and Cooking Fires"

To comply with the Bush Fires Act and Forests Act, fires should not be lit above the high water mark of the dam and must be at least 10' from the nearest inflammable material. They must not be left unattended and must be extinguished before being left.

Fires may not be lit when the forecast is dangerous nor during a Bush Fire Emergency ban.

The policy adopted is to accept the tourist and local fisherman and to educate them in the safe use of fires rather than attempt a complete ban which would be unsuccessful and antagonise the public.

It is hoped that the morning patrols can be gradually reduced as public education improves.

REGIONAL NOTES

METRO REGION

Staff

Sen. Forester Currie, Narrogin retired on 23rd April 1970. (See separate note).
A/F Cracknell transferred from Yanchep to become Forester at Ludlow.
F/G W. Anderson transferred from Administration to Research at Wanneroo.
A/F John Humphries transferred from Harvey to become Forester, Narrogin.
Miss Robina Raabe has commenced duty as Female Assistant, Kelmscott.

Plantation Fires

The Metropolitan plantations continue to be a target for juvenile Red Indians and Somerville had 22 fires for the 1969-70 season. Nick Bukelis (F/Ranger) must be a leading challenger to Les O'Grady for attendance at the greatest number of plantation fires.

Dieback Hygiene

Another of the Dieback Hygiene lectures by Mr. Frank Batini was presented on April 25th at Jarrahdale for engineering and survey staff of Western Aluminium. It was pleasing to note that Western Mining had already provided their field teams with instructions for observing hygiene precautions, and they will now up date these in the light of this latest discussion.

One of the company officers attending the course was Errol Miguel who is a cartographer for the industry, and was formerly a Forest Guard with the Department both in the field and for a time in Head Office.

COMO RESEARCH

The Forests Department of Western Australia have recently held a seminar on the Phytophthora cinnamoni root rot disease in the Jarrah forest. The delegates met at the Institute of Research and Protection, Como, between the 10th and 14th of November, 1969.

Research Officers from the Forests Department, the Forest Research Institute's Western Regional Station, the Department of Agriculture, C.S.I.R.O., and Research Fellows from the Australian National University and the distinguished visitors included Dr. L. Fraser (N.S.W. Department of Agriculture), Dr. J. Warcup (Waite Agricultural Institute), Dr. D. Cromer (Forest Research Institute), Dr. W. Heather (A.N.U.) and pathologists from the other State Forest Services.

The aims of the seminar were to review the current knowledge on the biology and ecology of this disease and to discuss the direction in which the various research programmes are heading. The contributions and discussions with the Eastern States' visitors have materially assisted the workers in Western Australia. It is considered that the visitors have also benefited from this review and from the inspection, at first hand, of a disease situation of considerable economic importance in an indigenous eucalypt forest.

The delegates considered that the diseases caused by P. cinnamomi are not solely confined to the eucalypt forests of Western Australia, but that this pathogen is of considerable importance to both Forestry and Agriculture throughout Australia. It was recommended that research on this pathogen should be co-ordinated on an Australia-wide rather than on a local basis.

HARVEY REGION

Staff

John Robley has been notified of his appointment as Inspector, Harvey.
Ross Gobby has resigned from the Cadet Training School and is sailing for Canada in the very near future, his place has been taken by John Skillen.
Chris Slotemaker de Bruine has taken up his appointment as A.D.F.O. at Dwellingup.
Gordon Styles arrived in Dwellingup to assume his position as District Forester and Bob Brierley who had acted in this capacity since Jack McCoy's retirement has gone to Pemberton as District Forester.
John Humphries has left Harvey and has gone to Narrogin as Forester 1/C replacing Senior Forester Jack Currie who has retired from the Service.
Bevan Forster has transferred from Mundaring to Dwellingup.

Safety

Harvey and Dwellingup continue the good work and with no lost time accidents, since the last issue Harvey have reached 179,000 accident free man hours and Dwellingup 150,000.
Collie reached 50,000 hours during the period but unfortunately a lost time accident has halted progress for a while.
-Congratulations to all concerned.

Fire Control

During the period Harvey achieved a notable 'save' with a fire deliberately lit in 35 year old fuel at 12.30 a.m. detected by William Tower and the fire extinguished by 3.30 a.m.

This is particularly notable as the fire was some 15 miles from the headquarters and the minimum fire danger for that night was brown.

Sports Section

Following a defeat at the Dwellingup cricket ground, Harvey organised a return match at Yarloop which resulted in a very close fought win for Dwellingup.

The 11th wicket stand at Harvey was enjoyed by all, particularly by those who had fielded all afternoon with temperatures in the mid 90's.

SOUTHERN REGION

Staff

After a lifetime of work in and around Pemberton, Ernie Percival has been transferred to Walpole.

Manjimup Forest Assistant Lionel O'Connor resigned on 29-5-70, and has taken up a position with the Lands Department in Perth.

Migrating E. ficifolia

About one chain north of Boronia Road in Crossing Block (ref. JN112) there exists a Eucalyptus ficifolia of some note.

At first glance it is the remnant of a giant of the species; - all that remains of a butt of some 36 feet in diameter are about 6 buttresses arranged in a circle, each of which continues to grow. The centre has been burnt out over the years; two are still joined.

However, even to a biased southerner in tingle country this gives rise to some doubt. Nevertheless it is rather fun to speculate on how the arrangement came about.

E. ficifolia tend to occur in groups; examples of smaller such groups can be found in the vicinity. It is conceivable that litter and branches would accumulate in the centre, and when a fire occurred, that mutually supporting combustion would cause dry siding on the inside of each tree of the group. Repeated fires would enlarge the scars.

The interesting point however is why this particular group is so large? Tall scrub and Banksia grandis of some size (2" DBH) now occupy the centre. It is possible that the trees have in fact migrated radially from the group centre? Over its lifetime the outside edge of a large karri or tingle moves 6 feet or more from a central point; two opposite edges move apart some 12 feet. If the tree is divided down the centre is there any reason why both sides should not continue to grow separately? Sheoak shows this fire caused tendency to grow radially away from a fire

scar. Butt scars reignite readily even with light fires. There would be sufficient heat generated to halt the enveloping occlusion tissue, but insufficient to halt growth on the opposite face.

After all what better reason for shifting scenery is there than a fire on your tail?

Large Girth Karri

20' G.B.H. in Karri is common. 30' G.B.H. is rare but expected in good overmature bush. 40' G.B.H. however, is most uncommon and worthy of note.

One such tree, measuring 40'-2" exists beside Boodanoo Road, Mattaband Block, Shannon River. It is difficult with trees of this size to be precise where breast height is. However, this particular tree is a hollow butt for approximately 25% of its girth, and the tape was stretched straight across the missing sector. There can be little doubt that it has exceeded 40' G.B.H.

The tree is no freak like some Red Tingle which are all buttress and no bole. It holds its girth up the bole in true karri style.

BUSSELTON REGION

Retirement — Twenty Officers were present to launch Ernie Brown into retirement on Friday 8th May at Busselton. After working with the Department since 1930, Ernie has now accepted an appointment with Central Engineering Services in Bunbury, as a sleeper examiner.

Pine Deaths Nannup

Autumn brown top at Nannup is increasing. A count in a badly affected compartment showed 50% of the trees to be dead or bare dead tops, while one plot showed a figure of 70% and a further 19% showed dead side branches near the top of the tree.

The problem has been complicated by Ips infestation. Although generally confined to brown topped stems, has also been found in green trees. Generally, 10% of the trees have been attacked by Ips.

Golf — Arrangements are in hand for the Nannup Golf Day to be held on Sunday August 2nd.

Staff — Cathie Rowe who resigned from the Nannup Office in February is currently in Scotland. She was replaced by Beverly Dean.

Denise Walsh who resigned from the Busselton Office in April has been replaced by Wendy Joyce.

SAFETY NEWS

Although satisfaction can be derived from the fact that we are at present enjoying our lowest ever accident frequency rate it is somewhat disappointing to record that during the period January-March 1970 inclusive very little progress was made.

Having achieved excellent results in reducing the frequency rate from 48 to 35 during the period July 1969 to February, 1970 inclusive, it was confidently expected that this figure would at least be maintained. However due to eight accidents being recorded in March as compared with one in March 1969, the frequency rate rose sharply to 39.

It may well be said that as a review of the accident prevention programme from July 1967 to the present date reveals an excellent achievement in reducing the frequency rate from a figure in excess of 100 to 39 that there is no cause for concern. It is sincerely hoped that this is not the general feeling.

There is no place for complacency in an accident prevention programme. Accidents will continue to occur unless constant vigilance is maintained in spotting the hazard, eliminating it where possible, guarding it if it cannot be eliminated or protecting the worker from it.

Considerable expense has been incurred in the endeavour to protect workers by the issue of protective equipment such as safety spectacles, helmets and gloves etc. and it is indeed disheartening to find that many accidents occurring are still the result of failure to wear these items.

This statement can be qualified by the following summary of accidents which occurred in March, where it will be seen that three eye injuries were recorded that were the result of either not wearing, or wearing inadequate eye protection.

Kirup	Hosing down a tractor	eye injury
Pemberton	Operating chain saw	eye injury
Wanneroo	Pine falling	eye injury
Kirup	Stacking sleepers	back injury
Manjimup	Tractor driving	hand injury
Wanneroo	Pine falling	axe-cut foot
Collier Somerville		insect bite
Shannon River	Lifting sleepers	dropped sleeper-foot

A number of divisions are still maintaining an excellent safety record, and are contributing greatly to the success of the overall programme. Worthy of special mention are Dwellingup and Harvey who have both worked a period in excess of 150,000 accident free man-hours, whilst Narrogin and the cadet trainee group have achieved an accident free period of 23 and 22 months respectively.

Congratulations are extended to the officers and employees of these divisions and to all other divisions who although not able to boast of such achievements, are maintaining a satisfactory record.

Frequency rate graphs for Dwellingup and Harvey have been included to show the excellent progress that has been made in these divisions, and departmental summary by divisions for the period July 1969 - March, 1970, reveals the overall picture.

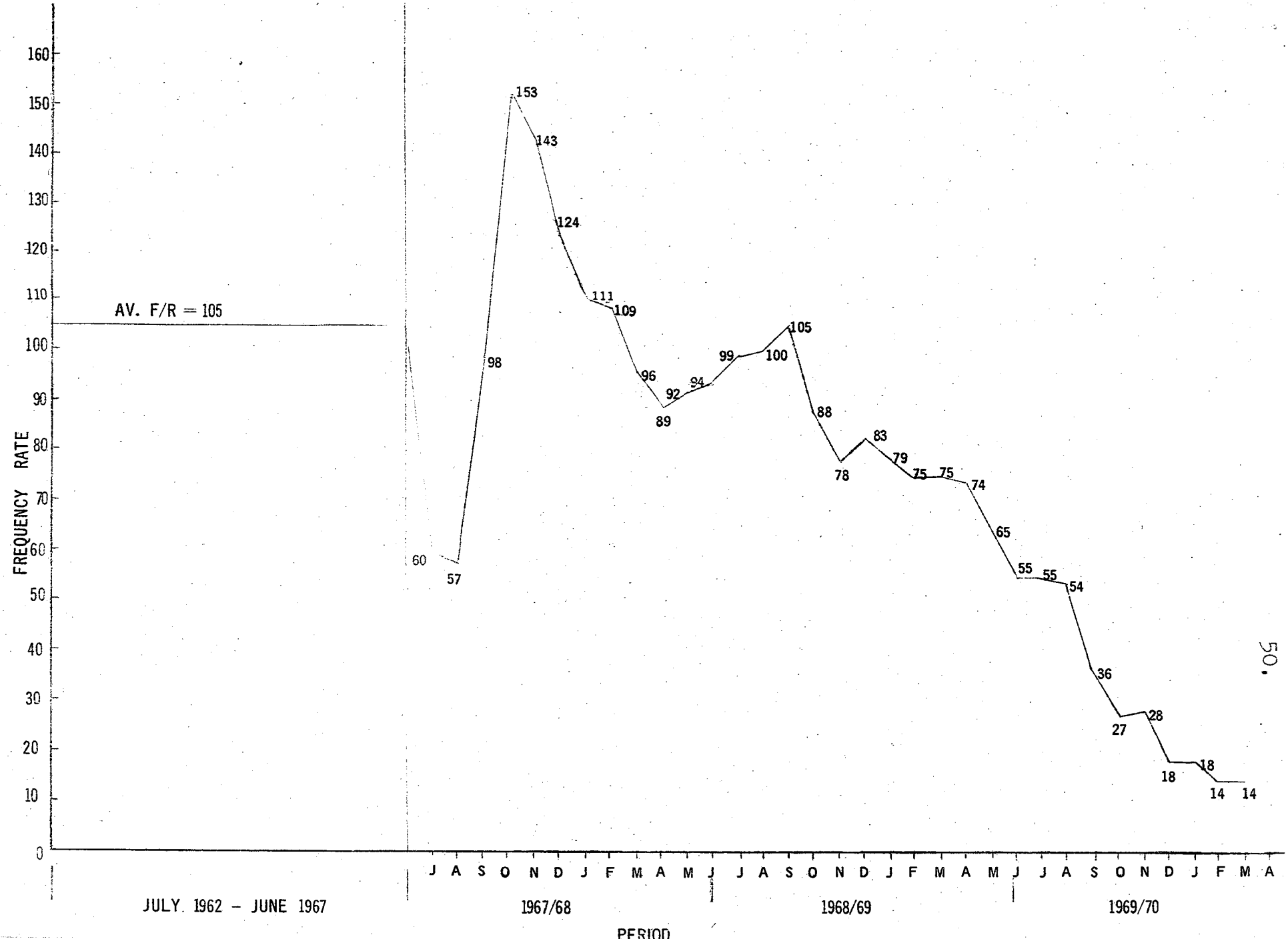
In the last edition of safety notes mention was made of those divisions who had qualified for safety awards. Apologies are extended to Busselton Division for having neglected to include them in the select band of 50,000 accident free man-hours award winners.

ACCIDENT SUMMARY : JULY 1969 - MARCH 1970

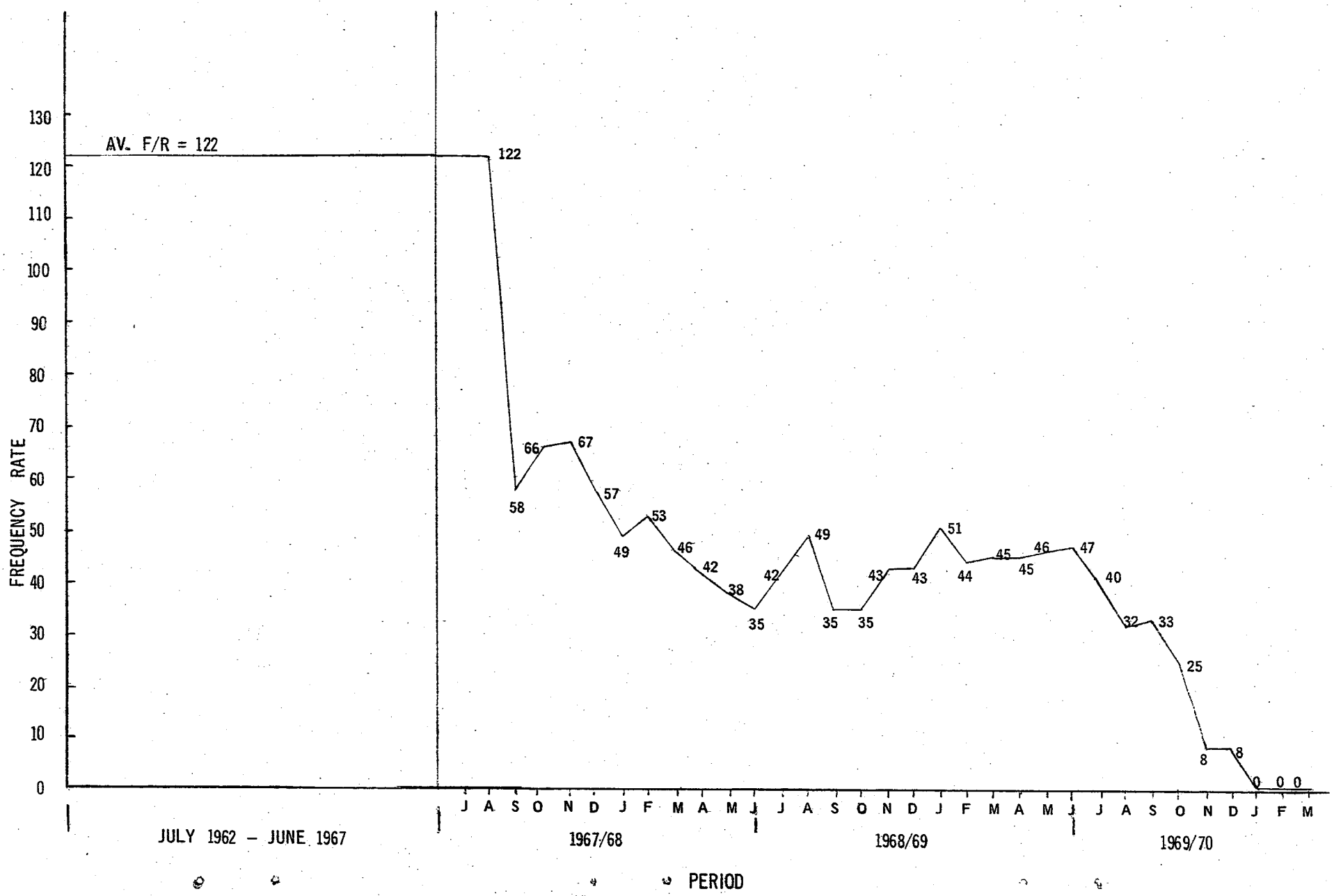
DIVISION	D.I.A.	F.R.
Busselton	5	46
Mundaring	1	21
Dwellingup	NIL	NIL
Collie	3	30
Kirup	11	110
Manjimup	3	24
Narrogin	NIL	NIL
Kelmscott	6	78
Collier-Somerville	2	47
Wanneroo	6	82
Harvey	3	14
Pemberton	3	18
Nannup	5	56
Shannon River	4	66
Trainees	NIL	NIL
Research	3	55
W/Plans	NIL	23
Kalgoorlie	NIL	NIL
Head Office	NIL	NIL

NOTE: F.R. calculated on previous 12 months figures.

HARVEY DIVISION



DWELLINGUP DIVISION



BE A DEFENSIVE DRIVER

Be a Defensive Driver

Avoid driving errors

Make allowances for lack of knowledge, skill and care by other road users.

Make allowances for weather, road and traffic conditions.

and by formulating sound driving plans and decisions based on

What CAN be seen

What CANNOT be seen

POSSIBLE circumstances which may reasonably be expected to develop.

You will uphold the principle of SAFETY for others as well as for yourself.

WHAT IS DEFENSIVE DRIVING?

Defensive driving is driving in such a way as to avoid being involved in a collision or situation causing danger or inconvenience to any road user regardless of the circumstances.

WHAT IS THE PURPOSE OF DEFENSIVE DRIVING?

The purpose of defensive driving is to reduce the likelihood of being involved in an accident.

WHAT IS A DEFENSIVE DRIVER?

A Defensive Driver formulates a driving plan based on the correct assessment of the ever-changing scene ahead and to the rear of his vehicle. He should have a deliberate and calculating temperament, able to make driving decisions without hesitation in a methodical manner at any moment.

ALL decisions must be based on the principle of SAFETY for others as well as himself.

WHAT IS THE BASIS OF DEFENSIVE DRIVING?

The basic features of defensive driving require the vehicle to be:

in the right position on the road

travelling at the right speed

with the right gear engaged

ALWAYS

HOW CAN THIS BE ACHIEVED?

BY CONCENTRATION AND DELIBERATE DRIVING TO A SYSTEM, which will enable the driver to formulate a safe driving plan to meet every circumstance likely to occur on the road and to carry the plan into effect skilfully.

HOW CAN I DRIVE DEFENSIVELY?

BY understanding thoroughly the definition and purpose of defensive driving.

BY acquiring a thorough knowledge of the regulations relating to road traffic.

BY a determination to give complete concentration to the task of driving.

BY intelligent anticipation of the possible action of other road users and circumstances to be expected in any or particular driving conditions.

BY the exercise of restraint and courtesy under all circumstances.

BY an understanding of the limitations of both human being and vehicle.

AND FINALLY .....
by the adoption of a SYSTEM in the task of driving.

A SYSTEM OR DRILL, EACH FEATURE OF WHICH IS TO BE CONSIDERED, IN SEQUENCE BY THE DRIVER AT THE APPROACH TO ANY HAZARD.

(A hazard may be any physical feature, such as a cross road, roundabout system, road junction, bend or hill crest, or any potentially dangerous traffic situation developing ahead).

IN TODAY'S TRAFFIC

WE CANNOT AFFORD

TO BE ANYTHING BUT

A DEFENSIVE DRIVER

SHATTERING EXPERIENCE

It is widely believed that you can prevent or at least reduce the chances of your windscreen being shattered by stones thrown up by passing vehicles if you brace it with one hand. A lacerated wrist was the outcome of this belief in an accident at one of our Divisions recently.

In the February 1970 issue of Coresearch, it was reported that a major glass manufacturer has carried out experiments to test the belief and found that bracing makes a windscreen more, not less, likely to shatter.

The tests showed that the more rigidly a piece of toughened glass is supported, the lower the velocity a missile requires to fracture the glass.

Tests have shown also that patent shock absorbers for windscreens do not work.

These are stuck on to windscreens and consist essentially of a rubber suction cup with an internal rubber button which is supposed to disperse shock waves created by stones hitting the windscreen.

Experts say the best way of protecting a windscreen is to fit a plastic or wire gauze protector.

In any event if a stone is thrown up at your windscreen it is surely wise to have both hands on the steering wheel to maintain control of the vehicle.

BACK AGAIN

Every year back injuries are major contributors to our accident record.

Give us a break and don't break yours while shifting or lifting.

"TICK" BITE TREATMENT

There have been many recent inquiries about the best treatment for "tick" bites. Doctor McNulty of the Department of Public Health reported on this subject in an early edition of Forest Notes. His report is now reprinted for the benefit of new men and officers.

"General instructions to your men affected by ticks should include dabbing the affected skin with lighting kerosene or methylated spirits, which should be included in their first aid kit, or to take a bath in warm salty water. Clothing should be changed and washed. General skin cleanliness, avoidance of scratching and good first aid to scratched and abraded skin to prevent infection or to treat it when it has arisen are most important.

"Dimethyl pthalate or other mite repellent could be used on exposed skin and clothing to prevent the mites from becoming attached.

"There are a variety of ointments which could be used to ease the irritation but these would be better prescribed by the person's own doctor".

To this can be added a report from the Queensland Forest Service that complete protection is afforded by the use of the repellent Dibutyl Pthalate.

The following recipe for a rellelent emulsion to treat clothing is recommended.

Half pint of Dibutyl Pthalate
One gallon of water
5 ozs. of soap

Cut soap into small pieces and boil in half gallon of water until soap is melted. Add the other half gallon of water and the half pint of Dibutyl Pthalate. Clothes which have been washed clean should be dipped in this emulsion, wrung out and dried. The emulsion can be kept for further use. One treatment of emulsion establishes repellent effects which survive four boilings.

An alternative method of using the Pthalate repellent is similar to that advised by Doctor McNulty. Rub the repellent onto exposed skin and the outside surfaces of trousers and socks.