FOREST NOTES

Forests Department Perth Western Australia

VOL 8 NUMBER 1

FOREST NOTES

Volume 8 - Number 1

March 1970

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New Cover Design. The new Forest Notes cover introduced with the last issue was designed by Mr. R. Fletcher, of Head Office Drafting Branch.

LETTERS TO THE EDITOR

The Editor,
Forest Notes.

Dear Sir,

I thought the October special issue was an excellent one and a very worthwhile method of disseminating information to field staff. Congratulations to officers responsible.

A few comments are offered:-

1) On page 27 in the second paragraph, I think that "F. R. I." should read "F. & T. B.".

2) In the volume of logs by classes on page 28, there is an apparent drop in mill logs, posts and peelers, after 1964/65. This is presumably due to the change from overbark to underbark log measurement as there was, in fact, no actual drop in volume utilised at this time. There was a steady upward movement from 1960 to 1968.

3) The quote by D. Spriggins on page 3 in the third paragraph is rather hard on the British Forestry Commission and should not be taken too literally. The Commission was well aware of what it was doing, but the policy was dictated by two world wars which left U. K. desperately short of timber on each occasion. Vital shipping space required for food had to be devoted in some instances to importing of timber. The consideration of timber as vital sinew of war was largely the reason for the establishment of the British Forestry Commission in 1919 to grow quantities of timber at whatever cost. This decision was reinforced following the country's experience in 1939-45, following which there was another great increase in plantation establishment.

D. W. R. Stewart,
DEPUTY CONSERVATOR OF FORESTS.

The Editor,
Forest Notes.

Dear Sir,

The October Forest Notes "Special Issue" was much appreciated. I hope the next Special Issue will be out soon.

John McCormick.

It is hoped that a Special Issue of Forest Notes, covering some particular facet of West Australian forestry, will be produced approximately once per year. The Special Issue for 1970 will be on Fire Control, and should appear in September or October. Solicitation of articles from appropriate officers has already commenced.

R. J. Underwood,
EDITOR.

26 Egham Road,
Victoria Park,
Western Australia
6100.

27/11/69.

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

Dear Sir,

I have noted with interest in past issues, some records of outstanding trees growing in this State. It occurs to me that Foresters have an excellent opportunity to place on record via the columns of "Forest Notes" details of the distribution of some of our native trees. Such records are extremely valuable from an ecological viewpoint and probably to the tree breeder too. Some of the remnants of small stands of for instance, Jarrah, Karri, and Marri are in danger of extinction, and once they are gone, no record of their occurrence remains.

When a species is located a long way outside its range the question arises - how did it get there? Is it the advance guard of a species extending its range or the fragment of a former much more widely distributed species. What evidence there is seems to point to the latter conclusion. In any case these trees must have been extremely hardy and drought resistant to have survived and are therefore valuable to the tree breeder. The following records illustrate what I have in mind:-

On a recent journey I located a small patch of Marri, Eucalyptus calophylla growing on Ellendale station east of Greenough and near the Greenough River - fronting Ellendale Pool. This, as far as I know, extends the range of Marri nearly eighty miles further north than I have recorded it before. My previous farthest north recording was approximately ten miles east of Green Head near the southern end of the Eneabba Land Settlement Scheme. The Ellendale occurrence comprises only about half a dozen trees with a height of about fifty feet and they are growing on a deep yellow sand on a bench above the river. They are probably all that remains of a larger group reduced to its present size by clearing for agriculture.

My farthest north recording for Jarrah, Eucalyptus marginata is a mallee form of the species growing on the eastern slopes of Mt. Leseur to the north east of Jurien Bay.

The most northerly occurrence of Tuart, Eucalyptus gomphocephala noted by me is a few miles east of Jurien Bay along a track to Cockleshell Gully.

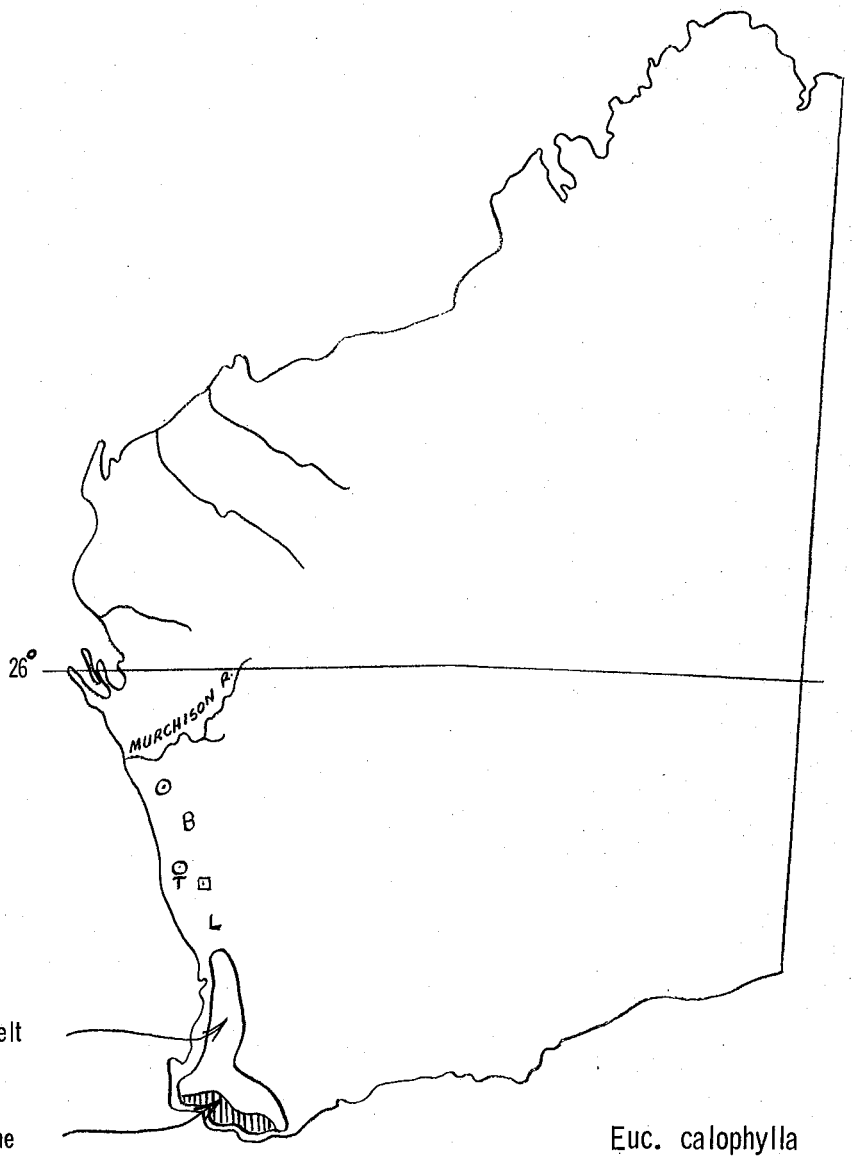
Coastal Blackbutt, Eucalyptus todtiana extends beyond the Arrowsmith River, but I have not as yet, seen it north of the Irwin River.

Eucalyptus Lane-poolei extends northwards along the Darling scarp to a point about 20 miles north of Gingin.

It is suggested that before these valuable provenances are wiped out, that it would be wise to collect seeds from them and establish them in arboreta and clonal orchards. In this way a valuable source of breeding material would be preserved for future foresters to use if the need arose.

Information on the extreme eastern range of Jarrah, Marri, Karri, Bullich, Yate and other south west trees would be of interest.

D. H. Perry.



Euc. calophylla
Euc. todtiana
Euc. gomphocephala
Euc. marginata
Euc. lanepoolei

PLANTING KARRI WILDINGS II

by P. Christensen.

This article is the second in a series dealing with the planting of Karri wildings on failed regeneration burned areas. Previous results from earlier trials carried out in 1968 showed little differences in survival between carefully lifted plants and plants merely pulled out of the ground. Plants varying in size from 6" high to over 3' could be transplanted with equal success and it mattered little whether they were lightly trimmed or not. However, stumping, although it had little effect on the survival rate of plants under 3', did tend to increase the mortality rate in plants over 3' high. Two to three foot, lightly trimmed plants were favoured above 2' - 3' stumped plants only because of their quicker initial growth due to their greater size.

This year a further set of trials were put in an attempt to determine approximately the most favourable planting date and also the effect of scrub removal. Four planting dates were considered; 1st June, 1st August, 15th September and 1st October. Two forms of scrub removal were tried. Spraying the area with 245 T before planting; manual removal of scrub by light cultivation of an area within an 18" radius of the plant.

Every treatment was based on a unit of 49 plants replicated in each of 3 separate areas of one year old scrub. The last three plantings were repeated on 3 areas burnt in Spring 1968/69 to simulate late planting after a failed regeneration burn. The plants used were 2' high, lightly trimmed which had shown best promise in the previous trials. Espacement was at 7' x 7' and all plants received 2oz. of Nutrifert at the time of planting.

Results:

Table 1 - Percentage survival of wildings at the end of the 1st Winter.

Treatment	Site	Planted 4/6/69	Planted 5/8/69	Planted 16/9/69
Control	I	72	0	2
	II	95	0	0
	III	77	24	0
Cultivated	I	95	14	4
	II	95	4	0
	III	89	10	0
Sprayed	I	38	6	0
	II	45	2	0
	III	41	8	0

The sprayed results are interesting; the spraying was done 1 week before planting but appears to have adversely affected survival. The second planting was sprayed two weeks prior to planting but it is difficult to judge the effects since survival at this date is generally poor. It is evident that plants transplanted on or after 1st July have not succeeded in becoming established. Results on the 1968/69 Spring burned areas were virtually 100% mortality in the early August and mid-September plantings. The October planting was abandoned due to these poor results.

It is interesting to record the percentage survival in three plots of open rooted nursery stock from Nannup Nursery planted on the same sites during early August. They were 75%, 57% and 77%. The only apparent difference between these plants and the wildings is the root pruning that they had some time prior to being lifted. The nutrient treatments given in the nursery could also perhaps be a factor. These results have special significance since the wildings were undoubtedly superior stock as far as general appearance goes.

Since the soil appeared to be as moist at the second planting as it was at the first and a reasonable amount of rain was received after planting, it is difficult to attribute the high mortality entirely to lack of moisture. It seems possible that other factors could be partly responsible. Wind is particularly prevalent at that time and experiments have shown that as far as pre-planting drying out of plants is concerned it appears to be one of the most important factors. It is also possible that pulling up plants and transplanting them at this time of the year just prior to Spring might in some way interfere with their physiological processes. At this time the plants reserves are probably being mobilised and differentiation of bud primordia going on in readiness for Spring. This could result in extra sensitivity to disturbance.

A further trial testing different sizes of planting stock was put in at the end of July. Trimming of the foliage was also included as an additional factor. A basic unit of ten plants per treatment was replicated twice on each of three separate sites.

Table II Mean percentage survival of transplants at the end of Winter.

Plant Size	Lightly Trimmed	Not Trimmed
6"	53	67
12"	62	53
24"	15	20
36"	18	7
48"	7	7
60"	3	0
72"	2	0

Once again the same pattern of high mortality experienced in the other July/August planting is evident. Only the smaller plants have managed to establish themselves and light trimming appears to be of no real benefit.

Discussion.

A number of trends have emerged from these trials.

1. It appears that the best results are likely to be achieved with early planting. How early? This is a question that still needs answering. It may be of interest to mention a small spot trial of only 25 plants, which were put in on 10th April, after the first autumn rain ($3\frac{1}{2}$ ins.). Thirteen of these plants have survived and appear to be reasonably well established despite the fact that the soil appeared to have been wet to only 3" at the time of planting and no further rain fell for the next two weeks. It is not suggested that planting should be done at this early date, rather the results indicate that earlier planting dates should be investigated.

2. If planting is done late in the season it seems that two factors may be of importance:

(i) Transplant size - although fairly large plants may be planted early in the season a smaller plant appears to be more successful later in the season.

(ii) Pre-treatment - Nursery plants 'hardened off' by root pruning some time prior to lifting appear to stand a better chance of establishing themselves than wildings.

It should be borne in mind that the above results are based on establishment at the end of winter, and many plants may not survive the summer months. However, it seems from last year's trials planted in June that plants that appear to be well established by the end of winter should survive the summer.

It had been thought possible that the injury incurred by cutting back plants might induce stem rot or cause deformity. Some Karri wildings planted some years ago were inspected, and it was found that although a 'dog's leg' may be formed in some cases this deformity soon disappears as new wood is put on by the stem. A number of trees were split open but in none of the stems was there any sign of rot.

Conclusions:

If planting is done early in the season requirements appear to be much less exacting than they became later. There seems to be little difficulty in establishing plants of up to 2' or 3' in height in early June.

Also it appears to make little difference to survival whether the plants are lifted or pulled and left untrimmed, trimmed or stumped. Thus one should aim for the largest possible transplant so as to give it the best chance in competition with scrub. If late planting is envisaged then smaller stock or nursery stock previously root pruned may be more desirable.

These are the indications at this stage, however further work needs to be done on planting dates and the interaction between this and transplant size and pre-treatment. This season was an exceptionally dry one and this is possibly the cause of the heavy casualties amongst the late planted stock. However, since there is never any guarantee that such a season may not reccur at any time it seems unwise to plant later than the end of June or possibly mid-July. If planting must be done later it might be wise not to use wildings at least until further work has been done on this problem.

LOGGING HYGIENE - CLEANING OF VEHICLES

by F. Batini

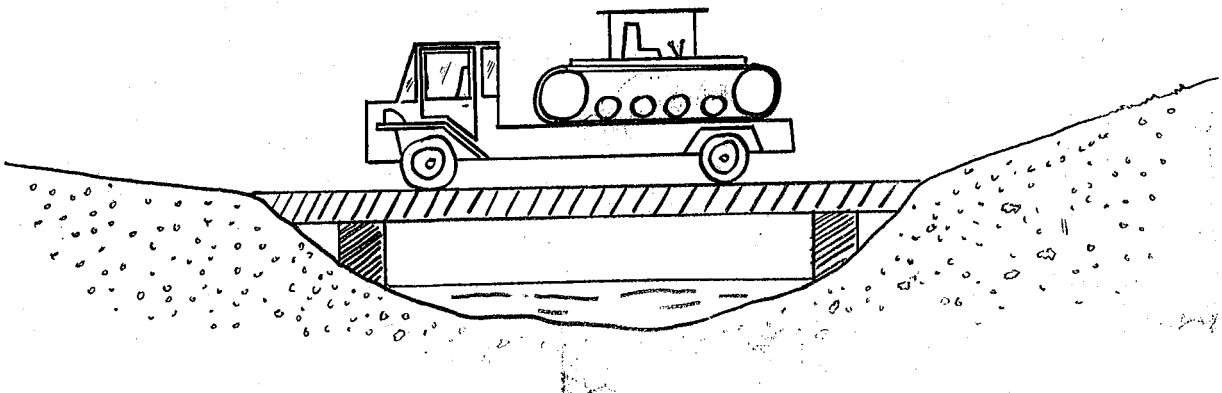
Soil samples from logging equipment which has worked in dieback areas have yielded positive recoveries of P. cinnamomi (Shea, pers. comm.). It is therefore obvious that the cleaning of infected machinery is an important aspect of the sanitation programme. Washing down of units is especially important when:

(1) Equipment enters a Division e. g. Contractor's equipment.

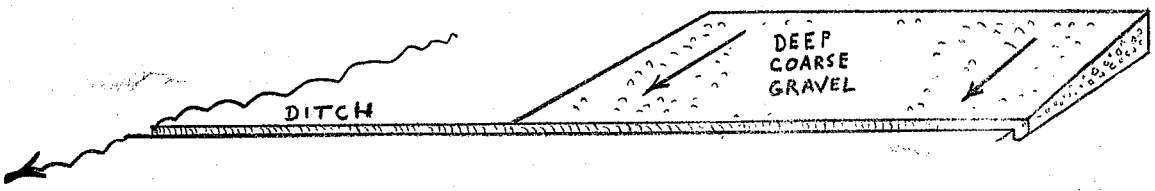
(2) Equipment commences work in healthy forest areas after working in dieback areas.

The aim is to remove as much earth and mud from the machine as possible. The more earth that is removed, the smaller is the chance of contaminating an area of healthy forest. The site where washing is carried out should be freely drained or amenable to cleaning so that the possibility of cross contamination is reduced. The operator should not be inconvenienced by having to stand in puddles of water and mud. Lastly, the diseased soil and roots must be treated in such a way that the possibility of creating new infections is minimised.

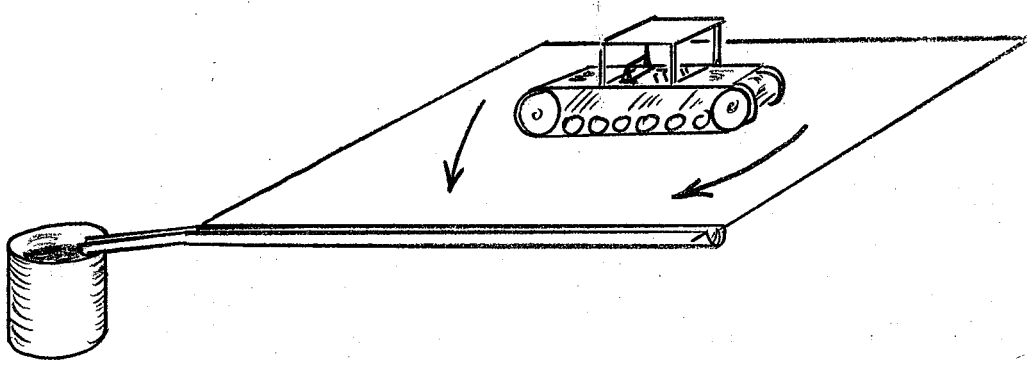
Three alternatives are suggested.



The above method is suited to streams in the northern jarrah forest when most gullies are infected. Access and approaches may need to be upgraded before these could be used as washing down sites.



Where Method 1 is not possible, the washing down area and its approaches could be built up with coarse gravel and the wash channelled into an already infected stream.



The third method could be used around D. H. Q., or in Divisions which are generally healthy and where the disposal of infected material is therefore more difficult. The area should be bitumenised, the wash collected into an underground tank and sterilised at regular intervals with Formalin or Copper Sulphate. Alternatively, the wash could be collected into surface tanks, sterilised with Formalin and then disposed of into a rubbish dump or a disused gravel pit.

The cost of these units will not be excessive, especially if one considers the value of the forest which is currently free from dieback. They could also create a good deal of goodwill particularly if they are made available to members of the saw-milling industry, S. E. C. or local contractors. After all, it will be difficult to convince the industry of the need of a sound approach in these matters unless we are prepared to give the lead ourselves.

THE WILD COUNTRY

by R. J. Underwood

The coast between Walpole and Augusta is perhaps the last true wilderness area in the south west of Western Australia. It is remote, wild and beautiful country, difficult of access and scarcely touched by the hand of man. "The Coast", as it has been reverently known by at least three generations of local settlers and forestry men, is a mecca for fishermen, campers and those who merely love the adventure and the romance of the wild country.

As a young graduate, I first came to know and love the coast several years ago when I spent three months on the second stage of the Northcliffe-Walpole F. A. R. G. Road across the South Northcliffe flats to the Gardner River. The road construction crew consisted of a D7 and driver, myself and my dog. This was before the recent upsurge of privately owned 4-wheel drive vehicles and the only other people we ever saw were the coastal-lease cockeys and occasional groups of mill hands or farmers who either came through on beaten-up old tractors or on foot down the banks of the Gardner. Their rations for a trip to the coast seemed to consist in the main of large plastic containers of plonk and their life-support system was the marron net, the beach fishing rod and the frying pan.

This was a period of rare adventure and discovery for me. There were trips to Fish Creek, with the beautiful peppermint and grass woodlands and the conical and bread-loaf shaped sand hills; Coodamurrup Beach with the old lease fences climbing up the sand drifts half-buried and stark; Lake Maringup, a glorious stretch of water tasting as sweet as lemonade, with flights of ducks and peppermint and yate stands growing to the lake's edge. Further west up the coast there is the Doggerup, Malimup Springs, the Meerup, the Warren Beach and the mighty Yeagarup Dunes. Beautiful names for beautiful country.

Coming back to within striking distance of this area in 1968, the lure of the coast was still there. The coast is easier to get at now, but still not easy enough to allow the casual visitor or city tourist. Windy Harbour and Salmon Beach are perhaps the only places into which one can drive with a two-wheel drive conventional vehicle. There is that masterpiece of road engineering, the "Sleeper Track", down to the mouth of the Warren, but even here one is faced with a two mile walk into the beach over unconsolidated sand hills about 800 feet high. The real attraction of the coast is, I suppose, that it has changed so little since the days of earliest settlement.

These areas are still used as coastal Cattle Leases as they have been for the last century, and one can still encounter a drover with his horse, dog and mob of cattle coming down from West Pemberton or East Manjimup. Standing on Calcup Hill, with the wind at your back and the smell of the ocean and the beach spinifex, you could as easily imagine you are in the year 1890 as 1970. The only blight on the horizon is the distant vista of the thousands upon thousands of ringbarked karri stags on the west Northcliffe Group Settlement blocks. Monuments indeed to the hand of man and his ill-inspired aspirations for progress and development.

But there are other signs of the intrusion of man. Foremost among these is the presence of marram grass throughout the coastal dune belts from the Donnelly River down to Malimup. The story of the fixation of the great dunes has already been told (See Perry and Weston, "Some Notes on Coastal Sand Dune Fixation in Western Australia", a paper prepared for the A.F.C. in 1949), but it is still fascinating to browse through the old files in the Pemberton office and piece together this early work. Sand Dune Reclamation was a function of the Forests Department until 1959, when the work was taken over by the Conservation Service of the Agriculture Department. Early work in this area was on the stabilization of the rapidly moving dunes near the mouth of the Warren River, the Calcup Dune encroaching on location 2417 ("The Colonels") and the Yeagarup Dunes, the faces of which were recorded as moving at rates of up to 3 chains per ~~year~~ into useful karri and jarrah stands. Numerous officers were associated with this work over the years, but Dick Perry in the 1930's seemed to be closer to the initial work than anyone else. His first report on our file, after a trip to the Dunes in the winter of 1936 makes good reading. Using a Mr. W. Brockman Jnr. as a guide and travelling by horseback, Dick reported that he managed to inspect most of the drifts between the mouths of the Warren and Donnelly Rivers. "Inclement weather restricted inspection somewhat", he reported. A nice piece of understatement, that. The scrub in this area is practically inpenetrable and is interspersed with swamps, quicksands, lagoons and watercourses. It must have been a pleasant winter's hike.

Later in the file one reads of the establishment of plots of pines in and around the dune country. Ernie Percival put in six plots of Pinus halepensis on the Yeagarup Dunes in 1953 and John Meachem planted pinaster on the Calcup Dune in 1956. Ernie and I have recently attempted to locate these plots and those that were not engulfed by moving sand have done quite well. One plot of halepensis, planted into Marram grass on a moving dune now carries a small stand of 20 foot trees. Their colour is good, but they are badly malformed by the wind and sand. The dune is now completely stable and is thickly covered with native scrub species. The pinaster on Calcup Dune have done even better, having good form, height and

diameter growth. Steve Quain estimates them to be equal to S.Q. III Stands at Gnangara.

Last winter another pinaster trial plot was planted on the Yeagarup Dunes. About 10 acres of pines were put in on a long transect across the moving face of the dune. The transect took in the whole range of sand dune sites from stabilized dune to open drift. Unfortunately the planting stock was exceedingly poor, seedlings being only about $1\frac{1}{2}$" to 2" tall. Nevertheless the trial is already showing interesting results. As expected the survival rate on the unconsolidated sand is negligible, but in the hollows and on the scrubby dunes, the plants are not only surviving but have made an inch or two of spring growth. It is apparent that deep planting is of great importance in these sandy sites.

A further small trial will be made next winter on the windward side of the dunes. In winter, the dunes can be crossed quite readily by landrover or on the D.F.O.'s motorbike! An attempt will be made to establish marram grass and pines in alternate rows across the drifts. It is hoped that better seedling stock will be available and that the summer following planting will be a little more favourable than this one.

There are over 30 square miles of sand dunes along the coastal strip of the Pemberton Division. It is likely that some well conducted planting trials now may be of immense value when a planting programme gets under way down here in the next few years.

In the meantime, what better excuse for a trip down to the dunes - the last of the wild country of the Southwest Coast.

PESTICIDE RESIDUALS SYMPOSIUM

by A. J. Hart

The following interesting features of some of the data made available at a recently held Symposium on Pesticides are set out for readers to ponder.

Table 1 below shows the pesticide residuals as p. p. m. of D. D. T. and retrieved from human flesh in various parts of the world. This was all the data presented indicated. What I have added here is the degree of latitude to parallel each of the localities quoted for the residual figure obtained.

PESTICIDE RESIDUALS IN HUMAN FAT. TABLE 1

LOCALITY	D. D. T. (p. p. m.)	DIELDRIN (p. p. m.)	LATITUDE
U. S. A.	11. 7, 6. 7, 11. 1, 10. 3	0. 15, 0. 11, 0. 31	50^{o} N - 30^{o} N
U. K.	2. 2, 3. 3, 3. 9	0. 21, 0. 26, 0. 21	58^{o} N - 50^{o} N
Israel	19. 2	Not Available	31^{o} N - 33^{o} N
Melbourne	1. 8	0. 05	38^{o} S
Perth	9. 5	0. 67	32^{o} S

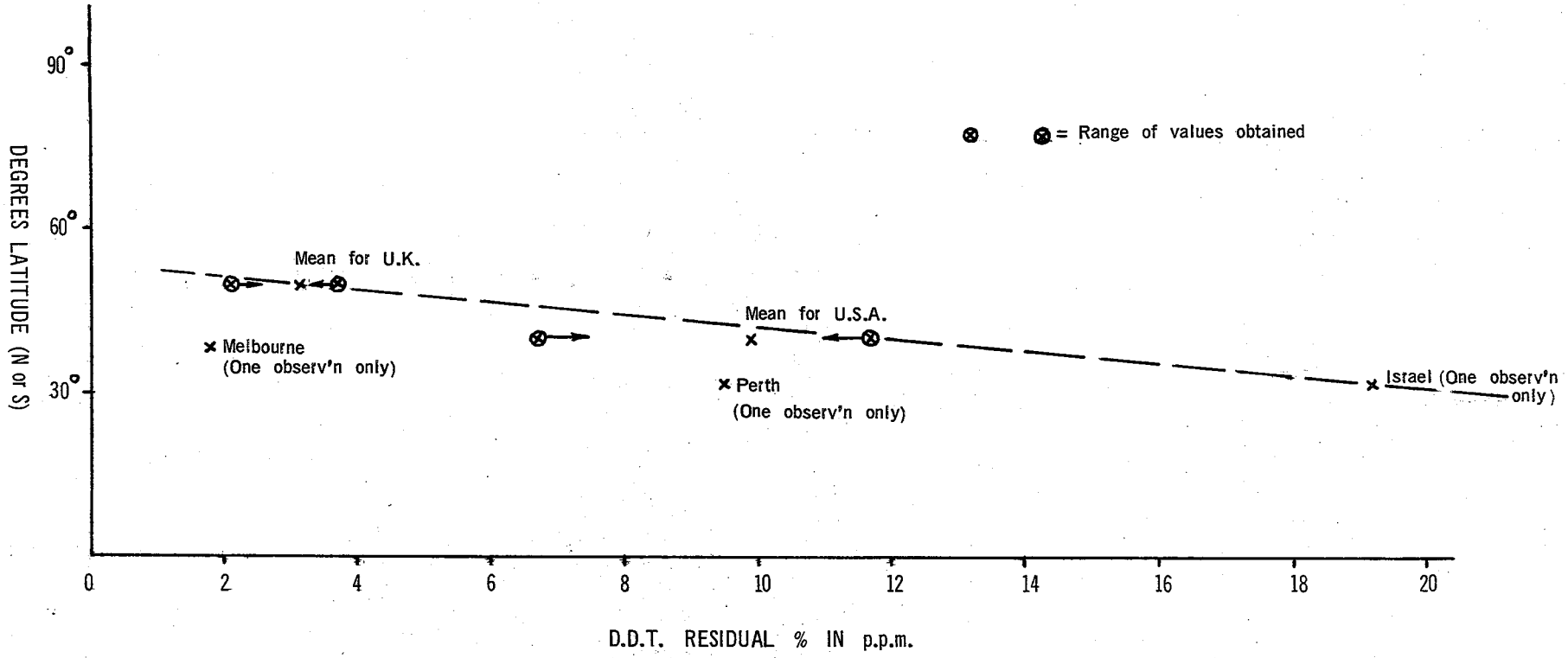
It will be seen from the graph derived from Table 1 that there is some evidence of a direct correlation between latitude and quantity of residual pesticide recovered except in the case of Melbourne.

Would it be possible that concentration of residuals in the human body is related to insulation of ultra violet rays and/or direct temperatures experienced? Melbourne does not seem to fit the graph properly; perhaps there is a "Venturi" effect on temperatures experienced there, caused by the constriction of land masses between Victoria and Tasmania.

From all this it is possible that covering of the skin of the body is important in hotter climates and possibly the importance of over-eating - or even protection from the humble conflagaration of your winter open fire.

ex TABLE 1

GRAPH OF D.D.T. RESIDUALS IN p.p.m.
FOR VARIOUS LOCALITIES (IN LATITUDE)



"DIEBACK" - ON THE MOVE

by M. J. Dillon

Introduction

In the past two years the research section at Dwellingup has established 18 rate-of-spread plots on Dieback areas throughout the Dwellingup division. The main species being assessed on these plots is Banksia grandis because of its susceptibility to the dieback fungus (Phytophthora cinnamomi).

Aim

The aim of this experiment is to investigate the uphill movement of the fungus. Little has been done in the past on this subject.

Listed below are some of the different factors which are being studied at Dwellingup.

(1) The effect of steepness of the slope on movement of the fungus.

(2) The effect of soil type.

(3) The effect of aspect.

(4) Whether there is a difference between the Western and eastern region of the Dwellingup division where there are considerable differences in rainfall.

(5) Slope position; slopes are divided into upper, middle and lower thirds.

Method

The requirements for rate-of-spread plots are a reasonably straight line of dead banksias with at least two chains of healthy banksias on the uphill side of the line. The line is between two and five chains long with individual pegs at one chain intervals. The banksias already dead and bordering the "Green Line" are painted to identify them. The "Green Line" is defined as the most recently dead banksias bordering the healthy green forest.

Assessment of the Lines

All banksias which have died or are dying since the previous assessment are surveyed by right angle offsets from the pegged base line. They are then plotted on graph paper to determine the spread. The plots are assessed at twelve monthly intervals. Originally, species such

as Zamia palms, black boys and some scrub species were assessed but these have since been omitted as there are very few of these dying on the plots.

Results

At this stage of the experiment we have recorded some results but it is too early to accurately determine the spread of the fungus in front of the "Green Line". One interesting point we have established is that over the past two year period the average spread of the fungus on the 16 established plots is only 4.84 links. The range of forward spread on all the plots ranged from .1 of a link to 26.1 links. The larger of these figures was excluded from the calculation of mean spread because it greatly exceeded the average taken from each of the remaining plots.

We are now trying to establish additional plots on low lying areas and on very steep slopes to cover a range of sites throughout the jarrah forest.

TESTING KARRI ON A JARRAH SITE

by E. Percival

As much of the jarrah forest in the Pemberton Division is very lacking in advance growth and in view of the dieback situation an experiment was started to test whether karri wildings could be successfully transplanted and grown on a jarrah site.

The plot is in Crowea Block, and details are as follows:

Site	JMA - B1
Soil	Brown sandy gravel - over yellow brown clay
Scrub	Bossea Lineafolia, Ti-Tree, Rushes and Blackboys
Area	2chains x 1 chain
Preparation	Following T/D burn, a few stunted marri fallen
Plants	Lifted from nearby Karri regeneration burn and planted with planting spears at 9 x 9 spacing = 120 plants, on 14/8/68. Average height at time of planting was 15"
Fertilizer	$2\frac{1}{2}$ ozs nutrifert speared into soil alongside each plant
Survival	At 13/2/70, 86 plants still growing
Growth	Height at 13/2/70 varied from 18" to 6' 3", an average of approximately 3' to 3' 6".

GROWTH OF TUART IN ESPERANCE

by B. Needs

While on a recent visit to Esperance on holidays, I was very impressed with the amount of Tuart trees used for ornamental purposes and windbreaks on farms and parks and the vigour with which they grow.

On one caravan park approximately one acre of Tuart has been planted for shade and shelter. These trees have been planted six years and their growth is impressive. Most of them are about fifteen to twenty feet high and have a butt measurement of 8" to 10" diameter. They were taken as seedlings from an old cemetery in the district where some old mature trees are still standing.

They are growing about four hundred yards from the beach in sand and appear to suffer no setback from salt or soil deficiency.

I was wondering if the Forests Department has any experimental plots in the district and, if so, what progress they have made.

TEST OF TREATED JARRAH AND KARRI AGAINST MARINE BORERS

by H. C. Wickett

To test the resistance of treated round jarrah and karri against attack by marine borers, specimens were suspended from the wharves at Bunbury, Fremantle and Port Hedland in November, 1959.

The specimens were round pole-type pieces 3 feet long by about 5 inches diameter while the controls were similar pieces of untreated jarrah. Seasoning and treatment of half the number of specimens with K55 creosote and half with Celcure A copper, Chrome, arsenic, were carried out by the Division of Forest Products, Melbourne. The retention in the creosoted karri specimens averaged 12.6 pounds per cubic foot of sapwood and in the C.C.A. treated specimens it was 1.99 pounds. The corresponding retentions for the jarrah specimens were 14.7 pounds and 1.88 pounds. Five specimens constituted a set; that is a control plus one specimen of each species and treatment. Two sets were suspended about 10 feet below mean water level at each of the three ports.

At the end of 1960 all the controls were heavily attacked by teredines and at the end of 1961 they were discarded.

At Bunbury at the end of 1960 there was no attack in the treated specimens and all the jarrah remained free from attack to the end of 1964. At the end of 1961 all the karri had slight teredine attack; in 1962 all had moderate attack and by the end of 1964 all the karri had heavy teredine attack plus slight to moderate limnoria attack. In 1968 the specimens were lost through vandalism but one set was recovered by diving in September 1969. The two karri specimens on this set, one creosote 10.1 lb/cu. ft. and one C.C.A. 1.75 lb/cu. ft were completely riddled by teredines and partially disintegrated by limnoria. The jarrah creosoted specimens showed a perfect outer surface and internally the sapwood was perfect but in the heartwood there were two teredine tunnels 3/16 inch in diameter. The outer surface of the jarrah C.C.A. specimen showed several small teredine holes but no limnoria attack. Crosscutting exposed 14 teredine holes $\frac{1}{4}$ inch diameter all in the sapwood, suggesting that C.C.A. treated jarrah sapwood is less repellant than jarrah heartwood.

At Fremantle in 1961 both sets were lost by vandalism and only one was recovered. In the creosoted jarrah teredine attack remained slight up to 1964 but in the C.C.A. jarrah it had advanced to heavy. Both

karri specimens had heavy attack by the end of 1964. This set also was lost and could not be recovered after 1964.

At Port Hedland at the end of 1960 only one set could be found. By 1964 both jarrah specimens had moderate teredine attack, the creosoted karri had heavy attack and the C. C. A. treated karri was riddled. By the beginning of 1969 both the karri specimens had disintegrated and both jarrah specimens had heavy attack in the heartwood. The creosoted piece showed only light attack in the sapwood but the sapwood of the C. C. A. treated piece was heavily attacked and partly destroyed.

The test showed that it was unsatisfactory to expose specimens at sites to which the public had access but in spite of the loss of some of the material it seems reasonable to draw the following conclusions :-

1. Teredine hazard increases with decreasing latitude.
2. Both treatments in both species resisted attack much longer than untreated jarrah rounds.
3. Both creosoted and C. C. A. treated karri are considerably inferior to treated jarrah.
4. Creosoted jarrah is appreciably superior to C. C. A. treated jarrah.

WALPOLE A GO-GO

by N. G. Ashcroft

It has been noticeable of late in Walpole that the local Public House is experiencing a surge of inflation. This inflation is equalled only by the gastric inflation of two happy home experts.

Messrs. Tuvik and Friemann are well known in most Divisions. For the uninformed, these esteemed gentlemen star in the award winning series, "Have House - Will Travel". At present they are enjoying an extended season in the deep South. That their popularity has not waned is shown only by the box office figures which show $2,200 per performance.

On a serious note, however, the object of this article is to indicate the present progress in the shifting of Shannon D. H. Q. to Walpole.

The new settlement will be divided into three sections within the Walpole Townsite, each about half a mile apart. This was necessary due to Shire land allocation and zoning. The new D. H. Q. will consist of :

Section A. Office, Yard and existing Walpole Settlement.

Section B. Single Men's Accommodation and transferred Shannon Houses.

Section C. Workshop, Pipe Ramp, Magazine.

Nine houses are to be transferred from Shannon River to Walpole, but to date only three are completed. A double shift will be required by some families while their house is being transferred, and this will be the most inconvenient part of the programme.

At the time of writing (mid February, 1970), progress on the various structures essential to a D. H. Q. can be summarised as follows:-

Truck Bays (12)	-	Incomplete
Heavy Duty Bays (3)	-	Completed
Oil Store	-	Incompleted
Workshop	-	Incompleted
Grease Ramp	-	Completed
General Store	-	not yet commenced
Office	-	not yet commenced
Single Officers' Quarters	-	not yet commenced

Of these buildings, the Workshop and Office are new constructions.

The Workshop is modelled on the Ludlow Workshop and consists of three working bays with an office and store. The roof is supported by five 35ft. pine, bowstring trusses built at Margaret River. The shift has been in progress since August, 1969, and progressed rapidly until controlled burning took precedence. A further surge of work should again take place during the prohibited season. At this stage it is anticipated that all families from Shannon will be in Walpole by May, 1970.

The Shannon River Townsite will eventually be ploughed and planted with hardwood species, mainly Karri. Pine planting is not envisaged due to protection problems.

Thus the Shannon River chapter is fast coming to an end, and a new chapter is beginning in Walpole.

REGIONAL NOTES

METRO REGION

Staff

Bill Adams, formerly on staff at Dwellingup, has commenced duty at Mundaring.
Nick Muciarone has transferred from Mundaring to Kirup.
Bill Anderson has returned to Wanneroo after a short term with Working Plans.
Congratulations to Bevan Campbell upon appointment to Superintendent for the North Region.

Fire Control

There will be a new CAUSE in Somerville's annual fire report this year, viz., "ROCKETS". Early this year a fire occurred inside the plantation and was started by an army rocket released somewhere within a nearby suburb.

Competitions

Kelmscott Division (represented by the Carinyah Gang and Overseer Bill Saunders) again won the pennant from Wanneroo (Morrie Paire's Gang) and Mundaring (Fred Luff's Gang). Some excellent performances were produced by all teams, together with a new set of cunning ways to by-pass the rules.

Safety

Congratulations to the Mundaring Division, for reaching 50,000 hours worked without a disabling injury. The plaque was presented to O.I.C. Kelers at Mundaring on February 10th 1970, by the Conservator of Forests.

HARVEY REGION

Staff

Senior Forester McCoy resigned in November after many years of faithful and energetic service to the Department. Jack became a legend in his time and many foresters of today owe a lot to him for the knowledge passed on by him. Several send-off parties were arranged for Jack but the one organised at Pinjarra was a great tribute to Jack - thanks to J. Robley and men.
F/G McWhirter has resigned to join the Department of Fisheries; this is the third "steal" of good young men by this Department.
J.B. Campbell, who spent some 14 years in Harvey has been appointed Superintendent North and has moved to Perth.
Assistant Forester B.M. Beer took up duties at Dwellingup during October.

Two new typistes have been appointed - Miss Kaye Kern at Dwellingup replaced Miss L. Grogan who has departed for an Eastern States tour, and Miss N. Gibson at Collie replaced Miss C. Campbell, who is to be married.

Safety — Congratulations are due to both Dwellingup and Harvey who have just turned in 100,000 accident-free hours. Incidentally, this means that all divisions in this region have now attained this level.

Chipwood — R. Palmer, using detachable semi-trailers and one prime mover, entered the field of supplying chipwood to Perth from the Harvey Division. This year his operations will move further south to Ludlow, Grimwade and Collie.

Jarrah Peelers — Hearnsteads have been taking up to 200 loads per month of Jarrah peelers from Riches Gully, Collie. In the new year this operation will be diverted to the Murray Valley.

Fire Control — The gangs training competitions saw some very competitive displays. The winning gang for the region was T. Warren from Dwellingup.

BUSSELTON REGION

Staff — A larger than normal number of staff movements have occurred in the Region during the period.
Graham Journeaux resigned from Margaret River in October and returned to the Jersey Isles.
John Skillen commenced duties as ADFO at Nannup, in November.
Gordon Styles has been notified of his appointment as District Forester at Dwellingup and anticipated moving in March.
Alistair McQueen resigned from Margaret River in December owing to ill health.
Vic Moore resigned from Ludlow in October to accept a position with Douglas Jones as Mill Manager at Busselton.
Arthur Holland transferred from Dwellingup to Margaret River in February.
Sandra Craigie resigned from Nannup office to take a position with the Superannuation Board in Perth. Sandra was replaced by Jeannie Stewart.
Cathie Rowe, also in the Nannup office, will leave on a working holiday to Europe in February.

Pine Deaths — Autumn Brown top at Nannup has again reared its ugly head, following the lowest annual rainfall ever recorded at Nannup, since recording commenced in November, 1924 i.e., 25.7". With at least 2 dry months to follow, the situation is somewhere between serious and catastrophic. At the present time about $\frac{1}{4}$ of the trees in 90% of the unthinned sections of Folly B. planted in 1956-67 are displaying dead tops and there is also a significant increase in the number of dead tops in certain exposed sections of Folly and Lindsay areas, planted in 1960.

Chipwood — Cullitys have commenced taking chipwood supplies to their Kewdale plant from both Ludlow and Grimwade, Ludlow supplying 3000 loads per year and Grimwade 2000 loads.

FAO Tour — Visitors from developing countries comprising the FAO tour in January, who were basically interested in Fire Control, visited Nannup and were shown facets of plantation fire control. They inspected the 1956 Radiata plantings and viewed the Nursery, during their short stay. They also viewed the Tuart forest at Ludlow during their lunch break.

SOUTHERN REGION

Staff — We were recently saddened by the accidental death of Forester John (Jack) Rate on 23/12/69 at Walpole.
Jack was a highly respected citizen in the Walpole District and an exceptionally capable Forester.
He commenced with the Forests Department in 1940 at Pemberton and was eventually transferred to Walpole in 1952.
Since that time he was involved in Major Forestry and National Parks Development in the area.
Forest Ranger Hunter transferred from Shannon River to Walpole as part of the settlement's shift programme.
Roger Burke transferred from Kirup to Walpole on 1/1/70, where he is temporarily filling the position left vacant by the demise of Forester Rate.
Terry Maher has left Pemberton for W.P.O. at Manjimup.
Ian Scott, who was a trainee with the Department in 1964 and 1965, but who then took up Share Farming at Bencubbin, has returned and is now stationed at Pemberton. At present he is employed as a Forest Workman.

Cricket — The B. J. Beggs Trophy elimination match between Manjimup and Pemberton was held during January. Manjimup were able to emerge victorious mainly due to high scores by Greg Heberle, Steve Quain and Byes. A vacancy for an experienced wicket-keeper is currently open at Pemberton.

Major Fires — Major fires at Manjimup, Pemberton and Shannon during January enabled the first field testing of the new Major Fire Organization. There is little doubt that the new organization is superior to the old, but some bugs still require ironing out. The major problem is still setting up the organization in the critical first 6 hours, particularly when neighbouring Divisions have concurrent fires.

New Industry for Pemberton?

The following is an extract from the May-June issue of "World Crops", in an article entitled "Introducing Essential Oil Crops". (The area concerned is the middle Limpopo Valley, African dry Savanah with a 10" annual rainfall).

"Another eucalyptus tested was the karri gum, E. diversicolor. This has, so far as is known, not been used commercially yet. The oil has a powerful and pungent odour, will strip paint easily, and must be kept in corrosion proof containers. Planted along river banks, where there is underground water for the roots, the karri gum thrives in semi-arid zones."

(Submitted by G. McCutcheon)

SAFETY NEWS

A steadily declining frequency rate during the six months period ending December 1969, is evidence of an ever increasing sense of safety awareness and management support in our efforts to reduce the suffering and hardships which result from injury accidents.

A number of divisions have achieved outstanding results with their accident prevention programme and are reaping the benefits that accrue from the little time required to organise and maintain interest in on the job safety.

Two Divisions, namely Pemberton and Dwellingup achieved the coveted 100,000 manhours worked free of disabling injury accident whilst Harvey, Shannon River and Mundaring achieved 50,000 accident-free manhours.

These outstanding safety performances were suitably recognised by the Conservator with the presentation of the appropriate awards.

Although these achievements are worthy of special mention, congratulations must be extended to the entire workforce for the part they are playing in making a success of our accident prevention programme.

The divisional summary for the period under review which appears on page 30 reveals the progress that is being made.

It will be seen that 15 fewer disabling injury accidents were sustained during the period under review compared with the same period last year.

This has resulted in a drop in our frequency rate from 48 to 40.

SAFETY STATISTICS : JULY, 1969 - DECEMBER, 1969

	DISABLING INJURY ACCIDENTS						TOTALS	
	July	August	Sept.	Oct.	Nov.	Dec.	July-Dec. 1969	July-Dec. 1968
Busselton	2	2	Nil	Nil	Nil	Nil	4	4
Mundaring	Nil	Nil	Nil	Nil	Nil	1	1	1
Dwellingup	Nil	Nil	Nil	Nil	Nil	Nil	Nil	5
Collie	Nil	1	Nil	Nil	2	Nil	3	1
Kirup	2	2	1	Nil	1	2	8	2
Manjimup	Nil	1	Nil	Nil	Nil	Nil	1	9
Narrogin	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Kelmscott	Nil	Nil	2	Nil	Nil	4	6	4
Collier-Somerville	Nil	Nil	Nil	1	Nil	Nil	1	2
Wanneroo	Nil	Nil	1	1	Nil	1	3	8
Harvey	2	1	Nil	Nil	Nil	Nil	3	11
Pemberton	Nil	Nil	Nil	1	Nil	Nil	1	1
Nannup	1	Nil	1	1	1	1	5	2
Shannon River	Nil	Nil	Nil	Nil	1	2	3	1
Kalgoorlie	Nil	Nil	Nil	Nil	Nil	Nil	Nil	1
Trainees	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Research	Nil	1	Nil	1	Nil	Nil	2	2
W/Plans	Nil	Nil	Nil	Nil	Nil	Nil	Nil	1
Head Office	Nil	Nil	Nil	Nil	Nil	Nil	Nil	1
July-Dec. '69.	7	8	5	5	5	11	41	
July-Dec. '68.	11	7	11	9	7	11		56

DEPARTMENTAL FREQUENCY RATE = 40

Forestry, due to its variety of operations, has long been recognised as one of the most difficult fields in which to apply the principles of accident prevention.

Since its inception, the Department has been aware of the accident problem; particularly as it affected the major forest industry of saw-milling.

In 1926 the Timber Industry Regulations Act was passed giving the Department legislative powers and responsibilities to record, investigate and secure safe working conditions in the milling industry.

Until the last decade however, safety precautions in Forestry and Industry were largely directed at guarding unsafe equipment.

Then, in 1959, Government Departments were directed by the Minister for Labour to amplify their efforts in accident prevention. The Forests Department formed a committee of senior officers who instituted detailed accident recording and met regularly to discuss accident causes and recommend methods of prevention. In time similar committees were formed in each field division. There was, however, little evidence of success from these moves and it became clear that further action was necessary.

Then in 1965 the Department initiated a training programme for field staff. An officer of the Department of Labour gave several "package" courses in Safety and a few officers attended two day sessions held by the National Safety Council for accident prevention training of supervisors. These sessions identified the principles of accident prevention and the management techniques used in a successful campaign. The type and scope of a successful Safety programme was clearly outlined.

With the guidance of National Safety Council officers such a programme was planned and undertaken within the Forests Departments. All officers and overseers were given formal coaching in the various techniques used to achieve accident prevention; policy in this field was defined, and an officer was seconded from fire control duties, given ten weeks schooling by the National Safety Council, and charged with the exclusive responsibilities of training and field promotion of the Safety campaign.

These efforts have been rewarded with marked success as can be seen in the following statistics:

ACCIDENT STATISTICS SUMMARY 1959-1969

	1959-67 Annual Average	1967-68	1968-69
Disabling Injury Accidents/year.	184 ± 16	124	96
Man Power	904	980	1000
Hours worked/ year.	1,808,000	1,896,000	2,020,000
Annual Frequency Rate.	102	65	48
Man days Lost per year through accidents	2,896	1,701	1,738

Due to a few severe accidents early in 1968, the lost time for 1968/69 has not been reduced below the previous year. However the number of accidents occurring is becoming steadily less, indicating the full measure of success from the Safety campaign is yet to be realised.

Several field divisions have achieved excellent Safety records in the past two years.

National Safety Council Awards for working 50,000 hours without a serious injury accident have been won by Dwellingup, Pemberton, Manjimup, Collie and Kelmscott Divisions during 1967/68.

Harvey and Shannon River won this Award in 1968/69 whilst Pemberton and Dwellingup repeated their achievement of the previous year. Similar awards for 100,000 hours free of accident were won by Collie and Manjimup divisions.

Though not all sections of the Department have demonstrated such fine results, they have certainly shown evidence of reduced accident rates and the enthusiasm necessary to continue improving.

Dated, 9th July, 1969.

ACCIDENTS CUT HOURS

An interesting article appeared recently in "The West Australian" newspaper.

More working time is lost in W. A. because of industrial accidents than industrial disputes.

The National Safety Council says that on an average, more working days are lost in W. A. in one year because of industrial injuries, than have been lost in industrial disputes in the past 26 years.

Last year 308, 885 working days were lost in W. A. because of industrial accidents.

Industrial disputes caused the loss of only 5, 994 working days.

HERE'S A SAFETY TWIST TO A TALE TOLD
BEST BY AGATHA CHRISTIE. . .

10 little drivers, cruising down the line;
one had a heavy foot, and then there were nine.
SPEED LIMITS ARE SET FOR YOUR SAFETY.

9 little drivers, the hour was getting late;
one dozed a moment, and then there were eight.
A TIRED DRIVER IS A DANGEROUS DRIVER.

8 little drivers, and the evening seemed like heaven;
one showed his driving skill, and then there were seven.
DRIVE SENSIBLY AND SANELY AT ALL TIMES.
A car is no place for a clown.

7 little drivers, their lives were full of kicks;
one bought a bottle, and then there were six.
PETROL AND ALCOHOL ARE A DEADLY MIX.
Don't drink when you drive.

6 little drivers, impatient to arrive;
one jumped a traffic light, and then there were five.
DON'T GAMBLE YEARS OF YOUR LIFE TO SAVE
A FEW SECONDS.

5 little drivers, wheeling near the shore;
one viewed the scenery, and then there were four.
CAREFUL DRIVING DEMANDS ALERTNESS AT ALL TIMES.

4 little drivers, happy as could be;
one passed upon a hill, and then there were three.
NEVER PASS ANOTHER CAR WHEN YOUR VISION
IS OBSCURED.

3 little drivers were busy, it is true;
one neglected car repairs, and then there were two.
FOR SAFETY'S SAKE, ALWAYS KEEP YOUR CAR
IN TOP CONDITION.

2 little drivers, and day was nearly done;
one didn't dim his lights, and then there was one.
SLOW DOWN FOR DUSK OR DARKNESS: ADJUST YOUR
DRIVING TO EXISTING CONDITIONS.

YES: 1 little driver, who's still alive today;
by following the safety rules, he hopes to stay that way.

(British Columbia MVB Bulletin)

USING YOUR HEAD

It isn't the number of guards put on
Or the stairs with the well kept rails,
It isn't the lights that they instal,
Or the lack of rusty nails.
It's true that these do help a bit,
But when all's been done and said,
The thing that prevents the accidents,
Is the way you use your head!

TOES :

I think that I shall never know
A poem as lovely as a toe;
A toe that is so firmly pressed
Within my shoe, where five congest;
A toe that takes me on my way,
With speed and sureness, through the day;
A toe that grants me freedom's stride
And keeps me walking tall, with pride,
Upon whose tender nail could drop
Loose objects that might crunch and lop:
No fool am I - I'll always choose
To keep my toes in safety shoes.