Tasmanian Regional Laboratory 1.3.61.

The Chief,
Division of Forest Products,
C.S.I.R.O.

We have with us at present Dr. Grote Reber of the Radio Research Corporation of U.S.A. He wishes to build a radio telescope in our central highlands, and it will involve the use of 106 hardwood eucalypt poles each 75 feet long, standing in the ground in clay soil to a depth of 8 feet. These poles will be about 18 inches diameter at the butt, and will weigh approximately 2 tons each. The location is at Bothwell, where the average rainfall is about 18 inches, and the poles must last a minimum of five years and possibly ten years before rot seriously impairs their strength.

Due to the size of the poles, Dr. Reber does not consider vacuum imprggnation would be feasible. Would you please advise Dr. Reber what preparation could be applied to the butt of each pole to retard rot, particularly at the ground surface.

Would you also please advise Dr. Reber how effective a given treatment would be in comparison with no treatment at all.

When replying to Dr. Reber's enquiry would you please address him care of the Tasmanian Regional Laboratory?

M.H.Bennett.
Clerical Officer.

COMMONWEALTH OF AUSTRALIA

COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANIZATION

DIVISION OF FOREST PRODUCTS

TELEGRAMS: FORESTPRODUCTS, MELBOURNE
CABLES: CARE CORESEARCH, MELBOURNE
TELEPHONE: MX 5831
The laboratory is situated at 69-77 Yarra Bank Road, South Melbourne, near the southern end of Spencer Street Bridge.

POST OFFICE BOX 310,
SOUTH MELBOURNE. S.C.5.

3rd March, 1961.

Ref: 8/32
FAD:GJ

Dr. Grote Reber,
C/- Tasmanian Regional Laboratory,
C.S.I.R.O.,
"Stowell",
Stowell Avenue,
HOBART. TASMANIA.

Dear Dr. Reber,

Mr. Bennett has written us concerning your problem of the preservation of 106 hardwood poles to be used in a radio telescope. He states that you do not consider vacuum impregnation would be feasible. If you are only concerned with the large size of the poles, we would like to point out that there is a ~~high~~ pressure treatment plant at Longford, less than 100 miles from Bothwell, which will accommodate 72 ft poles and may even take 75 ft poles. Such poles have been treated for harbour piles in the plant.

If it is at all possible, we would strongly recommend that the poles be treated in this plant because even if they were to be treated green, at least 10 years life could be obtained from such treatment and it could easily be double that. If they were treated after drying, 30 years life could be obtained from the poles and they would be saleable for re-use after you have finished with them. Poles could probably be obtained from the north-east of Tasmania, treated at Longford and then sent to Bothwell to reduce freight charges.

If such pressure treatment is not feasible, we would suggest that the poles be set in the ground as soon as possible after felling and that a galvanized sheet iron collar be placed around each pole at ground line extending 2 ft below ground level and 1 ft above. This collar should be packed with a mixture of crude borax and soil containing at least 10 lb of borax per pole. Borax costs roughly 9d. per lb in Melbourne. Space should be left at the top of the collar for the annual topping up of borax as soon as the material already there has dissolved. Borax is ~~sparingly~~ soluble and is a very effective fungicide. The sheet iron collar will reduce the loss of borax to the soil and maintain a reasonable concentration to enable it to diffuse into the sapwood. Provided that the soil is not very permeable, this method should give you the required life.

An alternative method would be to use the same collar and to saturate the soil inside it with creosote or 5 per cent. pentachlorphenol in mineral oil. Creosote is obtainable from Union Carbide Australia Ltd., 32 Walker Street, Rhodes, New South Wales and pentachlorphenol in oil from the oil companies. This treatment should also be replenished every year. Both these substances are very effective fungicides but they do not diffuse into wet timber so that they rely upon their soil sterilization properties rather than any ability to kill the fungus in the timber.

We have taken the liberty to pass on your enquiry to Hickson's Timber Impregnation Co. (Aust.) Pty. Ltd., who own the impregnation plant at Longford and they will doubtless be getting in touch with you.

Yours faithfully,

H. E. Dadswell
per F.A.D.

GR/NMD

20th April, 1961.

Dr. H.E. Dadswell,
Chief,
Forest Products Division,
C.S.I.R.O.,
P.O. Box 310,
SOUTH MELBOURNE S.C.5. VIC.

Dear Dr. Dadswell,

Ref: 8/32 FAD:GS 3rd March, 1961.

We were fortunate in securing a very good price on nice poles cut only seven miles from Bothwell. Most of the area where these poles will be erected is dry open paddock. There are a few places where water may stand occasionally. At such places the poles will be fitted with a galvanized ring, and borax used as suggested by you. The farmer says his fence posts rot twice as fast in fine sandy loam as anywhere else. These few poles will be likewise treated as above.

The purpose of this letter is to enquire about another matter. On top of each pole will be a hollow wooden frame with bakelite sheaves and fittings for handling the antenna wires. We wish to give these hardwood frames some kind of treatment to keep the water out besides merely painting.

The first thought was to boil them in paraffin. However it would be better if the paraffin or other substance could be made to penetrate a quarter of an inch or more into the wood by vacumm impregnation. Instead of paraffin some kind of plastic in solvent might be used. In this case the purpose is merely to keep water out of the wood and prevent warp and crack. No protection from fungus or rot is needed. Each frame is 2½" x 10" x 28". 96 frames are needed. Do you know anyone suitable to carry out this work in Tasmania?

Your comments and suggestions will be much appreciated.

I am,

Yours faithfully,

Grote Reber.

COMMONWEALTH OF AUSTRALIA

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POST OFFICE BOX 310,
SOUTH MELBOURNE. S.C.5.

3rd May, 1961.

Ref: 129/29
FAD:GJL

Dr. G. Reber,
Tasmanian Regional Laboratory,
C.S.I.R.O.,
"Stowell",
Stowell Avenue,
HOBART. TASMANIA.

Dear Dr. Reber,

In your letter of 20th April you enquired about suitable treatment for the hollow wooden frame carrying bakelite sheaves and fittings for antennae on your radio telescopic mounts.

If these frames are local hardwood it will be quite impossible for you to get any impregnation of paraffin or any other substance into the timber by yourself. We would suggest that as the installation is to have a limited life, the frames be made of the best kiln dried hardwood which would be treated with water repellent pentachlorphenol solution after assembly, or before, and then given the best three coat paint treatment possible after allowing the solvent time to evaporate from the penta solution. This will give substantial protection to the frames for 4 to 5 years and the penta will prevent incipient decay around the bolt holes and joints, at least for that period.

The alternative is to use a more suitable timber such as King Billy Pine which should be obtainable in the quantities you require and could be given superficial protection by dipping or painting ~~which~~ with mineral oil, e.g. clean sump oil. Galvanized bolts would be an advantage and should not cost a great deal more than black iron.

If water in the wood is likely to affect signal reception, then our first suggestion of painted, kiln dried hardwood should be used.

Yours faithfully,

H. E. Dadswell
per J.A.D

H. E. DADSWELL,
Chief of Division

P.S. Water repellent pentachlorphenol solutions are obtainable from Glazebrooks Pty. Ltd. as their 800 line.

C.S.I.R.O.

Forest Products Newsletter

DIVISION OF FOREST PRODUCTS, C.S.I.R.O., P.O. BOX 310, SOUTH MELBOURNE, S.C.5, VICTORIA

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NUMBER 298 JULY 1963

Protection of Hardwood Mill Logs during Storage

By R. M. Liversidge and R. Finighan, Seasoning Section

SUMMER STORAGE is a serious economic problem to many sawmillers in areas where large log reserves are required for winter cutting. Severe end and barrel splitting usually occurs in stored logs during the hot dry months, often reducing the sawn recovery by more than 10%. To examine the practical possibility of reducing these losses, a series of experiments on log protection was conducted at Heyfield, Victoria, during the summer of 1961–62.

The experiments were designed to assess the effectiveness and economy of various protective techniques in a typical storage yard. For this purpose 119 green alpine ash (*E. gigantea*) logs were obtained from the bush during early December and divided into eight test piles. Seven of these were set up in the log yard of Newlands Lumber Co. Pty. Ltd., the remaining one being incorporated into the water-sprayed log reserve at Licola Sawmilling Company.

Details of Procedure

A general outline of the experimental work as originally proposed was given in Newsletter No. 281 (December 1961). The protective methods actually tested* were as follows:

Method 1.—Log ends only sprayed with heavy petroleum grease dissolved in power kerosene.

Method 2.—Log ends and the exposed surfaces of the pile sprayed with heavy petroleum grease dissolved in power kerosene.

Method 3.—Log ends only sprayed with heavy petroleum grease dissolved in power kerosene, with weather shields (against sun and wind) at the ends of the pile.

Method 4.—Complete cover with outdoor quality vinyl plastic film.

Method 5.—Log ends only sprayed with a microcrystalline wax emulsion in water.

Method 6.—Log ends only hand-coated with heavy petroleum grease using brush and paddle.

Method 7.—Complete cover with water sprays.

In addition, a pile with no protection was used as a matched control.

Before treatment, the ends of all logs were examined and photographed and, with the exception of the logs under the plastic film, each pile was subsequently inspected at monthly intervals.

After approximately 10 months' storage all logs were milled into boards and palings.

• *Methods 1, 2, 3, and 5*. The sprayed end coatings were applied by using mobile pressure-pot equipment developed for this purpose by a Melbourne engineering firm (cf. Newsletter No. 281, December 1961).

• *Method 4*.—Before being covered with the plastic film all logs in this group were sprayed with sodium pentachlorphenate in water (2% solution). The objective was to inhibit any fungal growth which might develop in the high humidity conditions that it was hoped to establish around this particular log pile. To ensure an air-tight seal, the edges of the

* Consideration was given to testing log pond storage, but this was not undertaken because suitable facilities were not available at the time of the tests.

Fig. 1.—Typical degradation in unprotected "ash" eucalypt logs after summer storage.

sheet were trenched into the ground.

This part of the overall experiment was not completed, as after four months' use the film became brittle, the cover was badly torn by wind, and the logs became fully exposed to the elements. Nevertheless, to this stage, all logs had remained in good condition. Despite the fungicidal spray, however, some fungal growth had occurred, and it became clear that to ensure its control the preliminary fungicidal spray should have been used at a higher concentration. After the logs became exposed, degrade developed in the pile.

The failure of the film* made it impossible to test the value of this method, but it should not be assumed that because of this it is necessarily unsatisfactory.

At the same time, considerable difficulty was experienced in manipulating the film over the log pile, this appearing to be mainly due to (i) the weight of the film, (ii) handling difficulties even in a light wind, and (iii) the need for extreme care during placement to avoid tearing on projecting sharp edges.

• *Method 7*.—A description of the water spray system used was published in Newsletter No. 285 (May 1962).

Analysis of Results

Following the conversion of all logs, i.e. after 10 months' storage as indicated, the percentage log recovery obtained with each method of protection was separately calculated on the basis:

$$\frac{\text{Sawn Output}}{\text{Hoppus Log Volume}} \times 100$$

The values obtained are shown in Table 1. Average log volume and size were about the same for all groups, and similar sawing

*The manufacturer subsequently advised that the film used originated from a faulty batch of material.

Fig. 2.—Only minor degrade is apparent in these logs, matched with those shown in Figure 1, after summer storage under water sprays.

patterns were used throughout.

Clearly, best recovery is obtained if all logs are milled immediately on receipt from the bush. For the methods listed, next best recovery is given by the water spraying. However, even under the very favourable storage conditions provided by this method, i.e. with the logs kept in a water saturated condition, slight end checking developed. This is, presumably, mainly caused by stresses present in the growing tree which were released or unbalanced after felling and cross cutting. These growth stresses often establish lines of wood failure, and the extent of any further degrade is determined by the effectiveness of the protection given the log during storage. For example, the amount of degrade caused by the action of growth stresses alone is given by the difference in recovery between green and water sprayed logs, and reference to Table 1 shows this to be 5%. The further degrade due to drying stresses in the other groups is shown by the recovery figures.

To illustrate the economic significance of the various recoveries obtained, consider the case of a log dump holding 2,000,000 super ft (Hoppus). At 35/- per 100 super ft this would involve a capital expenditure of £35,000. Even under water sprays the unavoidable growth stress loss referred to above would reduce the

Table 1: Influence of Treatments on Sawn Recovery Obtained after 10 Months' Storage of Alpine Ash Mill Logs

Coating "A", heavy petroleum grease; coating "B", heavy petroleum grease dissolved in power kerosene; coating "C", microcrystalline wax emulsion in water

Test Method	Treatment	Percentage Sawn Recovery (Hoppus)	Loss in Percentage Recovery (Green logs as criterion)
—	Green logs—no storage	58	—
7	Water sprays	53	5
6	Hand applied coating "A"	51	7
3	Sprayed coating "B" *plus* end shield	51	7
1 2	Sprayed coating "B"—ends only Sprayed coating "B"—ends and barrels*	49	9
5	Sprayed coating "C"—end only	49	9
4	Plastic film cover	Not available due to film failure—see text	
—	Unprotected control logs	46	12

* The spraying of the barrels in treatment 2 was not successful as the coating weathered off fairly rapidly. Inspection of piles 1 and 2 showed little difference between the condition of the barrels, so an average for these two groups was used.

Table 2: Approximate Economic Comparison of the Value of Protective Measures in Reducing Degrade in Alpine Ash Logs during Storage

Method	Gross Value of Logs after Storage (£)	Cost of Treatment (£)	Net Value of Logs after Storage (£)	Loss Based on Water Sprayed Logs (£)
Green logs (not stored)	35,000	No storage		Nil
7	32,000	720	31,280	Nil
6	30,800	400	30,400	880
3	30,800	700	30,100	1180
1 & 2	29,600	80	29,520	1760
5	29,600	130	29,470	1810
4	—	7000	—	—
Logs entirely unprotected	27,800	—	27,800	3480

amount of recoverable timber by some 5%, thereby reducing the value of the log pile to approximately £32,000. The annual cost of the water spray system, including maintenance and depreciation, has been estimated at £720 giving a net log value of £31,280.

However, on the same basis, the value of the unprotected pile would be reduced to £27,800. The annual overall gain, in this case, by water spraying, clearly approximates £3500 on the quantity of material being considered. The degrade losses and treatment costs for all methods have been calculated in a similar manner, and are shown in Table 2.

Fig. 3.—Cross sections of matched "ash" eucalypt logs showing: L.H.S., typical degrade developed during unprotected storage through a summer; R.H.S., high degree of protection provided by water sprays during storage through a summer.

As mentioned above, the plastic film failed early in the test and a full analysis of this treatment was not possible. However, the estimated cost of covering a log pile holding 2,000,000 super ft would be about £7000, assuming that such a cover was a practical possibility. Even if two uses were obtained from such a cover, and the logs were maintained in as good a condition as those held under water sprays, the annual net savings would be small.

The results indicated that of the treatments tested, *a properly designed and efficiently operated water spray system is, without doubt, the most effective and economic method of protecting hardwood logs during storage.* On the other hand, end coating methods such as treatment 6 gave quite good protection and have the advantage of not requiring specialized handling equipment or ground consolidation such as may be required with water spray piling.

Fig. 4.—End coatings being applied by a lance attachment to a mobile pressure-pot spraying system.

Australian Timber Handbook

THE SECOND EDITION of "The Australian Timber Handbook" by N. K. Wallis is now on sale through various technical bookshops at 42/- per copy. This is a revision of the previous handbook, published under the auspices of the Timber Development Association of Australia, but has been enlarged and brought up to date in many respects. It is a text book that will fill a need that has been felt for some time.

The first edition was printed in 1956 and supplies were soon exhausted. For several years now, it has been impossible to obtain copies of this handbook; therefore the appearance of the second edition will be welcomed by all educational institutions and individuals interested in timber.

In the new edition there are additional chapters on finger jointing, mosaic parquetry and wood blocks, densities of some Australian timbers, and technical standards in the timber industry. Most of the other chapters have been revised and, in some part, rewritten; the references have been brought up to date. The format and printing of the new edition are superior to those of the old, and it is a first-class text book which all timber people will want to have at hand.

CORRECTION

Newsletter 297, June 1963, p. 2, Fig. 1: The lower group of specimens should be reversed, i.e. the badly attacked specimen at the extreme right should match up with the specimen at the extreme left, etc.

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