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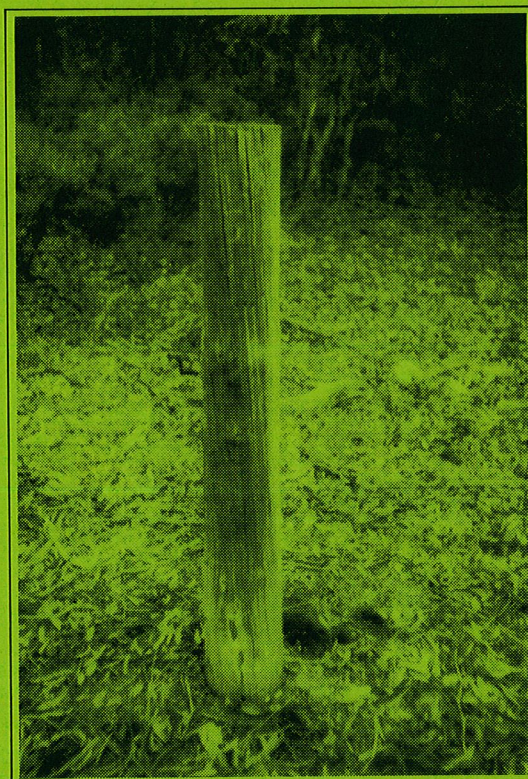
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The Wickepin Fence Post Trial after 57 Years of Service

by R.Rule



Report No. 11

September 1989



Wood Utilisation Research Centre
Department of Conservation and Land Management

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SUMMARY

The Wickopin fence post trial was one of three established in Western Australia in 1930 by the then CSIR, but is now the only surviving trial. The species included were wandoo, jam, brown mallet, jarrah, marri and radiata pine. Several preservative treatments were tested on the last four species, using hot and cold bath methods, but the wandoo and jam were left untreated.

The 1987 assessment gave an estimation of the service life remaining and the reasons for failures prior to the assessment. The untreated wandoo and jam, and marri treated with (i) zinc chloride and arsenic trioxide or (ii) sodium fluoride and arsenic trioxide, have performed best.

INTRODUCTION

In 1930 the Council for Scientific and Industrial Research (CSIR), now CSIRO, in conjunction with the then Forests Department, established three fence post trials in Western Australia. The trials were located near Pemberton, Wickepin and Southern Cross, on sites rated as having severe decay hazard, light decay and intermediate termite hazard, and severe termite hazard respectively.

The aim of the trials was to assess the efficacy of different water soluble timber preservatives and a mixture of creosote and crude oil in reducing fungal and termite attack in fence posts of selected native species and pine in these different hazard areas.

The Pemberton and Southern Cross trials are no longer operational. However, the Wickepin trial is generally in good condition, except for a small section of pine and jarrah posts which were damaged by fire. The last known assessment of the trial was by Mr N. Tamblyn of CSIRO in 1951, based on the extent of deterioration of each post (Tamblyn 1954).

This report gives the results of an assessment of the Wickepin trial in September 1987, in which the future life of the posts was estimated, and the factors contributing to post failure were assessed.

METHODS

The trial is a fence line located about 8 km west south-west of Wickepin, which is about 200 km south-east of Perth. With a mean annual rainfall of about 500 mm, the area was considered by CSIR to have light hazard for fungal attack but intermediate hazard for termite attack.

The Wickepin trial used 75 to 125 mm diameter posts of the following species:

	Total No.
Wandoo (<i>Eucalyptus wandoo</i> Blakely)	16
Jam (<i>Acacia acuminata</i> Benth.)	9
Brown mallet (<i>E. astringens</i> (Maiden) Maiden)	175
Jarrah (<i>E. marginata</i> Donn ex Sm.)	125
Marri (<i>E. calophylla</i> R. Br. ex Lindl.)	150
Pine (<i>Pinus radiata</i> D. Don)	125

The wandoo and jam were included originally to complete the fence line (Cummins 1932).

The chemical treatments used were:

- (i) creosote and crude oil. Two parts of creosote oil were mixed with one part crude oil.
- (ii) zinc chloride and arsenic trioxide (syn. white arsenic). A 53.8 per cent zinc chloride solution was added to water containing arsenic trioxide, and boiled for 20 minutes to allow it to dissolve. The final preservative contained 3.5 per cent zinc chloride and 2.0 per cent arsenic trioxide.
- (iii) sodium fluoride and arsenic trioxide. A mixture of 3.5 per cent sodium fluoride and 2.0 per cent arsenic trioxide was dissolved in soda ash and water to produce the preservative.
- (iv) arsenic trioxide. 4.1 kg (9 lb) of arsenic trioxide were added to 200 L (44 gallons) of water to form a 2.0 per cent solution.
- (v) solid arsenic. Arsenic trioxide powder was applied as a collar around the posts at and below groundline at the rate of 0.45 kg (1.0 lb) per post.
- (vi) untreated. This treatment was the control.

Table 1. Estimated additional life of fence posts by species and preservative treatment at the 1987 assessment.

Species	Preservative treatment	% In service	Estimated life (yrs)		
			0-4	5-9	10 +
Wandoo	Untreated	94	6	-	88
Jam	Untreated	89	22	67	-
Brown mallet	Creosote + oil	44	36	8	-
	Zn Cl ₂ + As ₂ O ₃	44	30	9	5
	Na F + As ₂ O ₃ (treated dry)	68	28	40	-
	As above (treated green)	28	12	16	-
	As ₂ O ₃ solution	44	36	8	-
	As ₂ O ₃ powder	28	16	12	-
	Untreated	0	-	-	-
Jarrah	Creosote + oil	44	20	8	16
	Zn Cl ₂ + As ₂ O ₃	72	-	20	52
	Na F + As ₂ O ₃ (treated dry)	72	4	20	48
	As ₂ O ₃ solution	56	8	32	16
	As ₂ O ₃ powder	52	12	20	20
	Untreated	0	-	-	-
Marri	Creosote + oil	68	20	36	12
	Zn Cl ₂ + As ₂ O ₃	92	12	52	28
	Na F + As ₂ O ₃ (treated dry)	92	8	48	36
	As ₂ O ₃ solution	84	16	44	24
	As ₂ O ₃ powder	60	8	36	16
	Untreated	0	-	-	-
Pine	Creosote + oil	60	12	28	20
	Zn Cl ₂ + As ₂ O ₃	68	4	48	16
	Na F + As ₂ O ₃ (treated dry)	24	16	-	8
	As ₂ O ₃ solution	32	20	4	8
	As ₂ O ₃ powder	52	8	32	12
	Untreated	0	-	-	-

Table 2. Causes of post failure including the 1987 assessment. Untreated post data (*) are from Tamblyn (1954).

Species	Preservative treatment	Decay	% Failures		Fire or accident
			Decay and termites	Termites	
Wandoo	Untreated	-	-	6	-
Jam	Untreated	-	-	11	-
Brown mallet	Creosote + oil	-	24	24	8
	Zn Cl ₂ + As ₂ O ₃	8	12	16	20
	Na F + As ₂ O ₃ (treated dry)	4	-	12	16
	As above (treated green)	28	8	8	28
	As ₂ O ₃ solution	4	8	20	8
	As ₂ O ₃ powder	8	8	28	28
	Untreated *	28	72	-	-
Jarrah	Creosote + oil	-	4	28	24
	Zn Cl ₂ + As ₂ O ₃	-	-	4	24
	Na F + As ₂ O ₃ (treated dry)	-	4	-	24
	As ₂ O ₃ solution	4	4	4	32
	As ₂ O ₃ powder	12	4	-	32
	Untreated *	8	32	-	-
Marri	Creosote + oil	12	4	16	-
	Zn Cl ₂ + As ₂ O ₃	-	-	-	8
	Na F + As ₂ O ₃ (treated dry)	-	-	-	8
	As ₂ O ₃ solution	4	4	-	8
	As ₂ O ₃ powder	-	-	40	8
	Untreated *	-	46	33	-
Pine	Creosote + oil	4	-	16	20
	Zn Cl ₂ + As ₂ O ₃	4	4	16	8
	Na F + As ₂ O ₃ (treated dry)	4	-	60	12
	As ₂ O ₃ solution	-	4	48	16
	As ₂ O ₃ powder	-	-	40	8
	Untreated *	-	88	8	-

REFERENCES

CUMMINS, J.E. (1932). Preservative treatment of fence posts in Western Australia. Progress Report No.2. 1st Inspection Report. CSIR Division of Forest Products. Project P4-1. Limited distribution.

TAMBLYN, N. (1954). Preservative treatment of fence posts in Western Australia: Eighth inspection - November 1951. CSIRO Division of Forest Products. Sub-project P4-1, Progress Report No. 9. Limited distribution.