

12. TIMBER PRESERVATION ON THE FARM

Early Treatment—The Test Fences

Much of the discussion at early field days at most branches of the Association was directed at producing durable fencing material from farm-grown trees. The days of available totara in much of New Zealand, silver pine from the South Island West Coast, or puriri in the north, were almost over when large-scale farm expansion was taking place after the second World War, and so farmers were looking for preservative materials to make *P. radiata* durable, or to add to the life of macrocarpa and eucalypt species. Concrete posts were used but were very heavy and broke easily, and iron standards had limited use.

A technical officer with the Forest Service, C.G.W. Mason, gave a paper to the 1958 conference at Massey College, in which he outlined all the current methods of treatment, and materials available for use on farms. Some methods involving pressure were beyond most farmers, but cold soak and diffusion methods were widely practised. Creosote was by far the most popular material although its quality was variable, but pentachlorophenol (PCP), copper and zinc naphthenates in petroleum oil, and water-soluble materials such as Tanalith, Boliden, and Celcure, were also used.

Brief mention was made by Mason of using suitable clothing when handling diffusion materials, as all contained arsenic, but PCP was used as a solution dissolved in oil and power kerosine, without mention of health risks. One wonders what today's Occupational Safety and Health people would say about methods in common use in the 1950s and 60s.

A number of contaminated sites, particularly from large commercial operations are still causing clean-up problems in the late 1990s.

One of the first matters discussed by the Executive of the Combined Farm Forestry Association was the question of testing fencing materials for durability. A.J.(Sandy) McQuire

from FRI worked with a sub-committee from National Executive, so that in 1960–61 six test fences were erected on the following properties:

- (1) C.Weston, Inglewood, Taranaki.
- (2) G.H.Blundell, Carterton.
- (3) R.W.Smith, Matahiwi, Masterton.
- (4) C.E.B.Pattison, Waiwhero, Waipukurau.
- (5) H.C.McKellar, Lees Line, Fielding.
- (6) T.O.Phillips, Whale Line, Oroua Downs.

National secretary, Murray Wilson, and Gerald Hocking from the Forest Service in Palmerston North arranged the supply and treatments of a considerable range of materials to be used in the fences. Timbers used ranged from a control of untreated *P. radiata*, to heartwood of red beech, Douglas-fir, robinia, macrocarpa, and a range of eucalypt species.

Commercial treatments included pressure treatment with creosote, PCP, copper-chrome-arsenate, and copper-zinc-chrome-arsenate.

Farm treatments were cold soak in creosote, cold soak in PCP, diffusion with fluor-chrome-arsenate-phenol, and sap displacement with high pH chrome arsenate.

Battens were included as well as posts, with an accelerated durability test by sinking battens up to 12" (300 mm) in the ground, as well as normal hung battens.

The whole operation became known as the graveyard tests, run by the graveyard committee. It is a pleasure to report that a number of graveyard committee members have proved more durable than the tested timber!

In 1966, an inspection reported by Sandy McQuire in *Farm Forestry 10/2* already showed up a number of ineffective treatments, and a final inspection in 1987 carried out by the Wood Processing Division, FRI, showed that commercially treated posts and battens had survived the best. The farm treatments, apart from creosote and PCP, were not very successful.

For natural durability, average soundness showed red beech 57%, *Eucalyptus saligna* 50%, *E. botryoides* 41%, *E. muelleriana* 18%, and robinia 38% after 25 years.



One of the *E. botryoides* posts on H.C.McKellar's property being tested for natural durability. Of the eight posts in this fence, seven showed slight decay and one severe decay at groundline.

Macrocarpa was down to 8%. Variability in natural durability is to be expected, as much depends on the age and heartwood percentage of the parent material.

Tanalised *P. radiata* (commercially treated) showed 91% soundness, pressure treated with PCP 73%, cold soak with creosote 83%, and cold soak with PCP 32%.

Untreated battens of *E. muelleriana* were 24% sound, robinia 48%, and macrocarpa just 4%.

The report concluded that most "farm treatments" were now of little relevance because the chemicals were not readily available or, in the case of creosote, were too expensive.

Pioneer Work with Different Materials

The early interest in farm treatment is reflected in some of the advertisements placed in *Farm Forestry* early editions. These included C.M.Malfroy, Wellington, for Bolit; Auckland Gas Co. for creosote, creo-soke which was blended for lower viscosity to allow for easy penetration in cold soak



A vat constructed from 44-gal. drums, for the cold-soak treatment of posts.

use, and Timba-Black, a creosote-pitch preservative for use on houses and sheds; Wellington Gas Co. for creosote and some weedkillers. Fletcher Humphreys of Christchurch advertised Osmosar powder for diffusion treatment of green sawn timber. Hickson's Timber Impregnation Co. (NZ) Ltd began advertising their commercial pressure-treatment plants in 1962.

Will Hull, renowned for his pioneering work on high pruning of *P. radiata* and macrocarpa, was an early enthusiast for cold soak creosote. By 1960 he had treated over 3000 posts and had no failures. His methods were to peel and dry *P. radiata* posts, then weigh samples as they were treated to ensure that a post 6' (1.8 m) long and 6" (150 mm) in diameter absorbed at least 6 pints (3.5 litres) of creosote. This involved a soak of 48 hours in warm summer months, with strainers requiring 72 hours, and sawn battens 2–3 hours. Mr Hull noted much more difficulty in getting creosote into macrocarpa, which needed 2 years' seasoning, and was still variable in the small amount, about 1–1½ pints (0.6–0.9 litres) of creosote absorbed.

Jack Stronge reported on a trial using mostly native timbers in the round for a fence erected on Doug Watt's property at Opunake. Doug was secretary of the Taranaki Branch at the time.

These posts were treated with Bolit salts, a 3% solution using 11 lbs (5 kg) salts and 37½ gals (169 litres) of water. Rubber gloves and aprons were worn. 18" (450 mm) of bark was removed from each end of the post, and a 1" (25 mm) biscuit cut from the top end of each post (to get rid of any gum build up) prior to standing it in a vat of solution about 5" (127 mm) deep. The solution was topped up each day, and when colour was seen to have reached the debarked line, a biscuit was cut from the bottom end of the post which was reversed into the solution for as long as required for the material to travel up the post in response to evaporation from the exposed end.

A second trial with the same species was set up using Osmosar salts and water, 10 lbs (4.5 kg) powder to 2 gals (9.1 litres) water.

The posts were debarked, laid across a drip tray, and the solution was brushed on (operators were wearing rubber gloves and aprons). After treatment, the posts were wrapped in building paper and a tarpaulin to prevent air circulation and allow diffusion of the solution into the green posts.

Penetration was checked by testing at FRI, and found to be irregular, varying from about 0.3" to 2" (4 mm to 50 mm).

After the posts had been in the ground for 3 months, Doug Watt noted the degree of end checking visible, as this would allow water to penetrate the untreated core.

Sandy McQuire duly reported that the most satisfactory results with Osmosar were in rewarewa, Lawson's cypress, and fuchsia. With Bolit salts, Lawson's cypress, rewarewa, and kohekohe were best. No final results of this fence have been found, but the shallow and variable penetration of preservative would indicate a limited extension to the post's life.

Needless to say, correspondence pointing out the necessity of saving bush remnants rather than utilising them for fencing material, was quick to follow.

Another ingenious method of treating unbarked posts was tried at Jack Stronge's property with help from Doug Watt and Sandy McQuire.

Known as the "sap sucker" method, it involved placing eight freshly cut posts in a drum with copper-chrome-arsenate preservative, and drawing up the preservative by means of a vacuum. Using a discarded dairy vacuum pump with a 1-hp electric motor, rubber leads went out to galvanised cones which were placed over the protruding end of the posts, after a piece of car tube was fitted to provide a seal. It was found possible to keep 22" (560 mm) of vacuum with the eight suckers going, with the pressure kept on until all the sap was removed, and preservative solution flowed through the posts. In young saplings of *Populus deltoides* complete sap replacement took about an hour, macrocarpa about 6 hours, and *P. radiata* about 8 hours. As the material was almost the same formulation as that used by commercial pressure plants, expectation of a successful long life was high.

About 40 posts treated with the contrivance were used in a fence on Jack Stronge's Opunake property, but there appears to be no record of how they performed or indeed if the "sap sucker" method was used elsewhere.

Fred Faulkner, a well-known Gisborne farm forester, wrote an article in praise of macrocarpa. In his experience, small rounds from hard growing conditions, allowed to season for a year or more with the bark on, thus allowing a degree of sapstain to develop, treated well in creosote, giving a good life to small material of little other value. He reported a 12-year-old fence still in sound condition.

Another well-known Gisborne farmer, Jim Holdsworth, found the supply of New Zealand creosote too variable, complaining to the 1966 AGM on the issue. Mr Holdsworth later made arrangements for the bulk importation of creosote from Australia to satisfy his large-scale operation at Te Karaka. Possibly more than any other farm forester, Jim knew the importance of dry posts (about 12½% moisture content) and good quality creosote. In recent correspondence, he says that he still considers creosote better than CCA, with no arsenic to worry about.

Neil Barr reported on a treatment method for long boards of green sawn *P. radiata* with Bolit salts. The boards were pushed through a 44 gallon drum (200 litres) with most of each end removed, and with his tractor weed-spraying equipment operating nozzles around the inside of the drum. As the sprayed boards came out they were block stacked for diffusion to follow. The farmer doing this job was Rod McKay of Waipu.

Another material tried briefly was AAC, alkyl-ammonium-compounds. These compounds were developed by FRI in 1977–78 and approved for the treatment of timber in the C5, C6, C7, and C11 commodity groups, now the H1 and H3 classifications—where protected by walls or paint H1, or unpainted clear of the ground H3. They were applied by pressure and were cheap, biodegradable, and, in service, ineffective. Timber was not treated by these preservatives in farm forestry situations, but was used on the farm, in vineyards, and kiwi fruit orchards, and on verandah decks

and it failed miserably. The Government agreed to recompense timber merchants who replaced timber on complaint and several million dollars were provided in compensation. In 1997, Government advised that in its opinion all claims should have been met, and the compensation scheme would cease.

At the 1974 Greymouth Conference, delegates saw a demonstration of a sap displacement system using a compressor. The ends of the logs were smoothed up and a cup was fitted over the end as in the vacuum method. In this case the pressure pushed the sap down the log and when the colour changed at the bottom end one knew that saturation point had been reached.

A variation on this method had a section of bark removed from the centre of the log, with a sealed band fitted, with pressure forcing treatment up and down.

Another variation used a 5 gallon (20 litre) container hung in a tree to provide the pressure.

Tricunol may have been the chemical used. This was a spirit-based preservative, tributyl tin oxide and copper naphthenate. Its use was discontinued due to the green colour and resin bleeding in dressed timber.

A prerequisite for the treating of roundwood posts, either on the farm or commercially, was the peeling of bark. A sharp spade or axe did the job to begin with, followed by a heavy knife with a handle at each end, which the operator used to pull strips of bark toward himself.

Tractor-operated machines using chain flails were then developed, followed by more sophisticated and faster mechanical peelers. Hand peeling was difficult around nodes, and considerable debate followed on the weakening of posts by machine debarkers that reduced nodes to a diameter that was uniform with the rest of the post, but this is now standard, and the posts are easy to handle. The Skillings is now the most commonly used portable peeler, tractor driven, with posts revolving against counter-rotating planer heads giving a spiral-finished even-diameter post. Taking two men to operate, production can exceed 1000 posts per day.

The Morebark is a larger, less portable machine, with wider blades giving a smoother finish, and is used for large poles as well as posts, but it needs four men for efficient operation.

Membership of Timber Preservation Authority

From the early 1960s, a worry to farm foresters was the lack of a voice on the Timber Preservation Authority (TPA). It was felt that farmers were both large-scale suppliers of material to be treated, and large-scale users of the end product, and so should be represented. The TPA monitored standards of all commercial treatment plants in New Zealand.

Efforts were made by the Association and through Federated Farmers without success.

The problem of wire and staple corrosion when using freshly treated posts was often raised as a concern, with longer drying periods requested before the sale of posts.

Brian Pattison of Waipukurau was nominated to the TPA in 1968, but he was able to have only an advisory role without voting rights. He was asked to stress to the Authority the problems of corrosion of staples, the inadequate retention of CCA in battens for ground contact, and the variability of creosote.

Joe Taylor, who was an affiliated member of Federated Farmers as farm forestry representative, and who served as a co-opted member of the National Executive of the Association from 1974 to 1986, was appointed a farmer member of the TPA in 1979, and remained on the Authority until it ceased to exist.

This appointment was made only after repeated requests from both Federated Farmers and the Association. Joe Taylor reported on the need for such membership as the Authority tried to visit every treatment plant in the country every 3 years, and saw some serious errors being made, such as treating insufficiently dried material, or posts with peniophora canker. Instances of just dipping posts in a dye were discovered, with the ultimate deterrent, suspension, being imposed in the worst cases.

By reporting to Executive and Annual Meetings, Joe was able to keep the members informed.

Finally, the TPA went out of existence in March 1988, when standards of treatment were left to the treatment companies to monitor.

B.O.Lonn, a Timber Officer with the Forest Service in Wellington, wrote of more modern methods using PCP in 1970, by which time natural gas was expected to close down gasworks and the supply of creosote. Mr Lonn reported better solvents for PCP, but specifically mentioned the risks of using the material without adequate protection. Skin irritation or even severe dermatitis could result from contact, and care had to be taken against inhalation.

More recently, the material has been completely banned from use in New Zealand as possible contamination by dioxins has made it a serious threat as a carcinogen. A great deal has been spent in cleaning up old dumps where preservative treatment was carried out at Waipa and Hanmer.

M.E.Hedley, FRI Rotorua, became interested in a new ICI product called TC Oil as a preservative, and after laboratory tests, co-operated with Brian Pattison in cold soaking posts for a field trial. The bath consisted of 75 litres TC Oil, 25 litres iso-propanol, and 150 litres diesel. The idea was to have a solution uptake of 20% of the untreated post weight. The time taken to absorb this varied with temperature and time of the year. This trial took place in 1974, but Brian Pattison writes that after accelerated tests it was proved to have no lasting preservative ability at all.

The Last Word?

As commercial pressure-treated posts and battens using CCA became standardised and available throughout the country, the emphasis of most farmers with forestry produce was to cut and dry, then transport to the nearest treatment plant for use back on the farm or for sale, and so the interest in do-it-yourself home treatment waned. Farm returns were also improving, and wages increasing, allowing less time for matters other than farm management.

Not a bad summary of the whole topic of farmers treating their own timber came in the form of a letter to *Farm Forestry* in February 1961 from one “Botryoides”, who could be none other than Neil Barr. His letter was headed “Witches’ Brew” and read:

“Sir-

Probably inspired by the amount of writing on farm timber preservation in our journal and in the *NZ Farmer*, some of our friends have been referring with some justification to the ‘alchemist school’ of farm foresters. Fair enough, for we do seem to have given more thoughts to our methods of preservation of thinnings than to our plantings.”

He later goes on:

“I am all with the mystics and the ‘only God can make a tree’ school of foresters from whom the criticisms come, and will dance around a good tree with the best of them, but I would dance more blithely if that tree had good, natural durability and some good end use. But the good Lord in His wisdom puts natural durability into His trees slowly, and here am I with acres of dark, sombre pines of that one species. So of necessity I am forced into the devil’s kitchen to convert their thinnings into posts and battens. Once having dabbled into such occultism, the devil seems to have seen to it that much of my time has been spent in answering enquiries on how to use these brews.

“I do apologise to my friends and hope they will do their best to bring me back to my first love—a good durable eucalypt.”