Protecting Trees From Borers With Aluminum Foil Wraps

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In the spring of 1955, the Oklahoma Experiment Station started trials using aluminum foil as a tree wrap to control borers. Four different species of trees were used in the study as follows:

Tree Number 1. Pin Oak, *Quercus palustris.* This species was planted in the spring of 1955. The trunks were about three of four feet in height and had a caliper ranging from two to three inches.

Tree Number 2. Moline Elm, *Ulmus* sp. This species was planted in the spring of 1955. The trunks were about five or six feet in height and had a caliper ranging from three to five inches.

Tree Number 3. Mimosa, *Albizzia julibrissin.* This species was planted in the spring of 1955. The trunks ranged from four to eight feet in height and had a caliper ranging from two to four inches.

Tree Number 4. Maple, *Acer* sp. This species was planted in the fall of 1953. The trunks were three to four feet in height, and had a caliper ranging from one half to two inches. The maple trees had suffered intense borer damage during the summer of 1954 before they were wrapped.

METHODS

The aluminum wraps, which were cut from one foot rolls into rolls four inches wide, were applied by Houser's method (1) in the spring before the emergence of the adult borers began. The wrap was started slightly below the bottom scaffold branches, and wrapped spirally downward with 50 percent overlap giving two thicknesses of wrap. The wrap was carried below the ground level, where four to six inches of soil had been dug away from the trunk. After the wrap was carried below the ground level the surplus soil was then replaced around the trunk and packed, in order to hold the wrapping securely. Six trees in an open parking area were wrapped with a crinkled paper which had two thicknesses cemented together with asphaltum. These six trees were intermingled with the others in this open area for a comparison between the paper wrap and the aluminum foil. Observations were made several times during the summer and fall as to conditions of the wraps and trees. The last observations and records were taken November 24 and 26, at which time the wraps that had stood up the entire time were removed and the trees closely examined.

RESULTS

The aluminum foil was neat and relatively easy to handle and apply, although frequent injuries to hands were received by the person applying the wrap. In cutting the one-foot wide roll into four-inch strips, a considerable amount of crushing occurred which made the strips difficult to unroll without tearing. Observations showed that hand crinkling caused the foil to stay in place very well. However, repairing was necessary quite often due to the expansion of the tree's trunk which split the foil. This could probably be remedied by a mechanical crinkling of the foil at the factory. Another factor causing much unnecessary repair was the watering of the trees which washed the packed soil away from the trunk and released the lower portion of the wrap. Once the end was free, the wind removed the wrap in a short time. It is evident that some other method of fastening the wrap at the base should be used.

Only twelve of the wraps ever came loose from the trunk after the first wrapping. This is a very small percentage of the total trees wrapped as noted in Table I, but none of the twelve trees which had the wraps remain intact had any sign of insect damage. This should indicate that with a little modification, the aluminum wraps would be practical. Aluminum

foil is readily available and for home use one would easily be able to observe and maintain the wraps which should make them more effective. The paper wrapping is not as easily obtained, and many people never wrap a newly planted tree for this reason. If the foil were crinkled, it is believed that it would be a practical wrap for new orchard plantings.

Protecting the trunk by wrapping has definitely reduced the number of trees killed by borers. The reduction in the number of trunks attacked would have undoubtedly been larger, but the wraps were purposely not repaired as needed during the summer to see how well the foil remained in good condition. Many trees had the base of the trunk exposed, and examination of both the foil wrapped trunk and paper wrapped trunks showed that these exposed trunks were attacked by borers in a number of cases.

The data indicated that wrapping the trunk of the tree up as far as the first branches is not sufficient to prevent infestation of the tree. While a reduction in borer infestation and fatality is possible, many of the larger scaffold branches are still killed by the borers. Observations definitely proved that when the trunks were wrapped, the beetles oviposited on the limbs above the wraps. To be really effective in preventing attack the branches as well as the trunk should be protected since the trunk was definitely unattacked when the wrapping was not blown off.

Population of adults and infestations of borers appeared quite uniform in all the pin oaks. In this case, all the other species could be considered to have comparable borer damage to the extent of the pin oaks, although borer damage was not as prevalent in the remainder of the experimental layout.

Borers were not the only insects that caused extensive damage to the trees. Five trees, four pin oaks and one elm, were killed by the girdling action of termites. In watering the trees, the shelter tubes were washed from the outside of the trunk several times, but the termites would readily build them back. At one time, shelter tubes were observed as high as the lower branches or a distance of approximately four feet above the ground level. The five trees were devitalized by the termite action. These trees were later replaced. The only elm to suffer borer damage was one that had been attacked by termites.

The mimosa tree wrappings needed frequent repair as indicated by the table, but they were obviously not attacked by borers. The larger elm trees which would ordinarily have a higher infestation of borers had only one tree attacked. This is probably due to the fact that the larger rough trunk held the wrappings better and longer, giving the added protection necessary to prevent attack. The pin oaks seemed to have the most trouble, but all this trouble was not due to devitalization caused by transplanting alone. Many of the trees were suffering from severe chlorosis, and this extreme devitalized condition attracted a larger number of beetles than would otherwise have been anticipated. The wrappings seemed to stay on the pin oaks moderately well. The table indicates that the maples suffered the most intense damage by borers. This is misleading, however, because the borer damage on them was incurred the summer before and was only calculated in the table for a comparison with the other tree infestations. The maples were wrapped to see how well the wrap would withstand the growth of a small trunk. The results obtained from the maples were comparable to those obtained from the pin oaks as indicated by the table. Ordinarily the smaller the tree, the better its chances for escaping injury because of its quicker recovery and growth following transplanting. This fact is well known, although this experiment does not bear this out.

It has been suggested that foil might have some insulating qualities which would prevent sun scald on trees with a more tender bark. Tests have not yet been made to proev this, but it may have good possibilities. An experiment is planned along this line, as soon as the temperature rises, and the sun's rays become more direct.

TABLE I

THE DURABILITY AND EFFECTIVENESS OF ALUMINUM FOIL USED AS A TREE WRAP

Kind of Tree	Number of Trees Wrapped	Average Number of Times Wrapped	Wraps Absent Due to Trunk Expansion		Wraps Absent Due to Watering Maintenance and Wind		Live Trees Infested With Borers		No. of Trees Wrapped Once
			Number	Per Cent	Number	Per Cent	Number	Per Cent	
Pin Oak	77	1.8	25	32.5	48	62.3	22	28.5	4
Elm	25	1.5	8	32	10	40	1	4	6
Mimosa	20	2.2	6	30	14	70	0	0	0
Maple	17	1.9	12	70	2	11.2	8	47	2

Bibliography

Houser, J. S. Borer Control Experiments, Proceedings of Annual Meet. of the Thirteenth National Shade Tree Conference (September, 1937) 159-67.