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THE VEGETATIVE PROPAGATION OF BASSWOOD BY AIR-LAYERS^{1/}

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Chiefly due to its wood qualities, American basswood (*Tilia americana* L.) is a valuable timber species of Minnesota's hardwood forests. It is especially prized as a woodlot tree by farmers in the Southern counties. Although basswood is a typically vigorous sprouter, artificial methods of vegetative propagation have been little investigated. The objective of this study was to determine the possibility of using air-layers as a method of basswood propagation. Minnesota Forestry Notes No. 86 reports on the rooting of cuttings.

During the last week of June, 1959, six clonal sprout clumps, three to six years old, were selected for treatment. They were located near Otisville, Minnesota, about 14 miles north of Stillwater. The application of the air-layers was as follows: (1) a branch of 1958 wood was partially girdled; (2) a treatment was randomly selected (list of treatments given below) and applied to the wound area; (3) moist sphagnum was placed around the branch enclosing the girdle; (4) a sheet of clear polyethylene was used to cover the sphagnum; and (5) the ends of the sheet were secured with short pieces of wire, thus forming a "package" (Fig. 1). The following treatments were used:

- | | |
|---------------------------------------|---------------------------------------|
| 1. 1% IBA (Indolebutric acid) in talc | 7. 1% IAA in lanolin |
| 2. 2% IBA in talc | 8. 2% IAA in lanolin |
| 3. 1% IAA (Indoleacetic acid) in talc | 9. 1% IBA in agar block ^{3/} |
| 4. 2% IAA in talc | 10. 1% IAA in agar block |
| 5. 1% IBA in lanolin | 11. Control (no treatment) |
| 6. 2% IBA in lanolin | |

Each treatment was replicated four times, hence there were 44 air-layers per clone and a total of 264 for the study. Roots of successful air-layers were well developed by July 26, 1959 (Fig. 2).

In general, the IBA treatment gave better rooting results than the IAA treatment (see Table 1). The best results were obtained with 1% IBA in agar blocks. Differences between clones and individual treatments could not be analyzed because of the small sample size. One problem that remains is the development of a satisfactory method of establishing rooted air-layers after removal from the branches. An attempt to pot twelve of the rooted air-layers was unsuccessful. The remaining twenty-two were left in the field for an additional four weeks in the hope that the brittle roots would harden-up enough to permit handling. They were removed from the branches and planted in sand with the polyethylene wrapper still in place. Slits were made in the wrapper to allow for future root development. The effectiveness of this treatment will not be known until the air-layers are lifted.

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^{3/} A 4% agar concentration was used.



This exploratory study has demonstrated that with the proper treatment rooting can be induced by air-layering in basswood. However, before the method can be considered a practical method of propagation, some means of establishing the rooted air-layers must be developed.

TABLE 1
Summary of Rooting Results

Treatments	Clones						No. Rooted/No. Treated	% Rooted
	A	B	C	D	E	F		
Talc								
1% IBA		2	1		1	1	5/24	20%
2% IBA	1			2			3/24	12%
Lanolin								
1% IBA	1				1	1	3/24	12%
2% IBA	2	2	2		2	1	9/24	36%
Agar								
1% IBA	3	1	2	2	2	2	12/24	50%
Control						1	1/24	4%
Lanolin								
1% IAA*		1					1/24	4%
Total by Clones	7	6	5	4	6	6		

* Only one air-layer that received IAA treatments rooted.



Figure 1. An unrooted air-layer with the wrapper partly open. Note callus formation which was typical of most unrooted layers. Photo July 26, 1959.

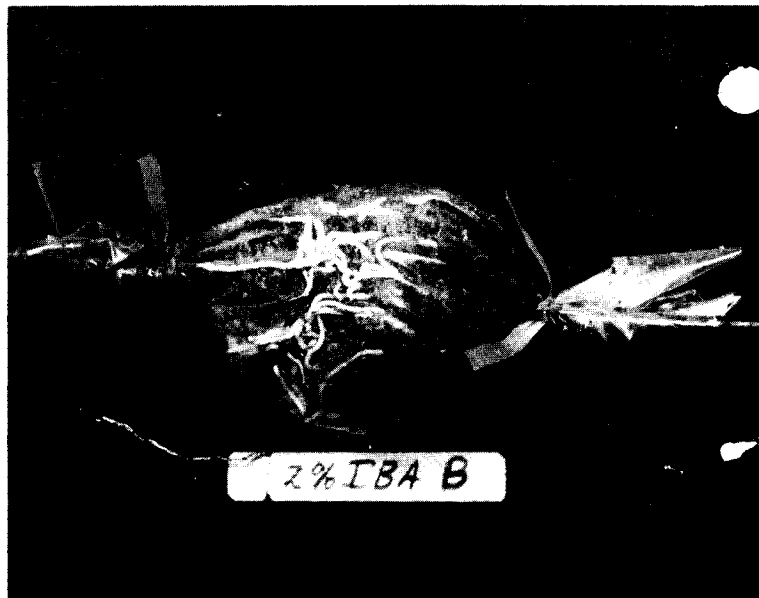


Figure 2. A typical rooted air-layer. Treatment was 2% IBA in lanolin. Photo July 26, 1959.