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TREATED LUMBER FOR GREENHOUSE USE

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Durable woods, such as the heartwoods of cypress, redwood and western red cedar, are extensively used in the construction of greenhouse benches and flats or trays and may last for seven to 10 years or even longer. The continuously high temperatures, abundant moisture, and contact with soil, result in rapid rotting of nondurable heartwoods and of the sapwood of all species so that they rarely last more than a year or two.

A question frequently asked is why preservative treatment is not given the available and low-cost nondurable species to make them more serviceable for greenhouse flats and benches. The principal problem involved in the use of preservative treated woods in greenhouses is one of plant injury. The majority of the older preservatives, such as creosote and zinc chloride, are toxic to most greenhouse plants and have been shown to be too hazardous for this use.

The studies summarized in this report were made from 1950 to 1953 in an attempt to determine whether any of the recently developed preservatives, both proprietary and non-proprietary, had possibilities for this use. The preservatives tested are listed in the table. The treated lumber, some of which was treated in commercial treating plants and some in the School of Forestry, was used in constructing flats of the type shown in the figure. These were loosely stacked in a heated room for about one month prior to use in order to permit elimination of preservative solvents. The flats were then filled with soil and seedling tomato plants were transplanted to them. In order to determine whether toxicity to plants would continue to show up in further use of the flats, tomato plants were grown in them annually for four years. When not in use during the test periods, the flats were stored beneath greenhouse benches with the soil in them kept moist through frequent watering.

Evaluation of plant injury was made by comparing color, top growth, and root growth of plants from treated flats with normal plants grown in cypress flats. Dry weight determinations on tops and roots were made during the first two years of the tests. The figure indicates the range of injury encountered.

The combined observations made on growth, color, and dry weight of plants over the four year period that plants were grown, and the condition of representative flats with respect to decay and serviceability at the end of the period, are shown in the table.

Summary and Recommendations:

Of the preservatives tested, only copper naphthenate and Erdalith (which is not readily available) appeared to be sufficiently free from injurious effects on the test

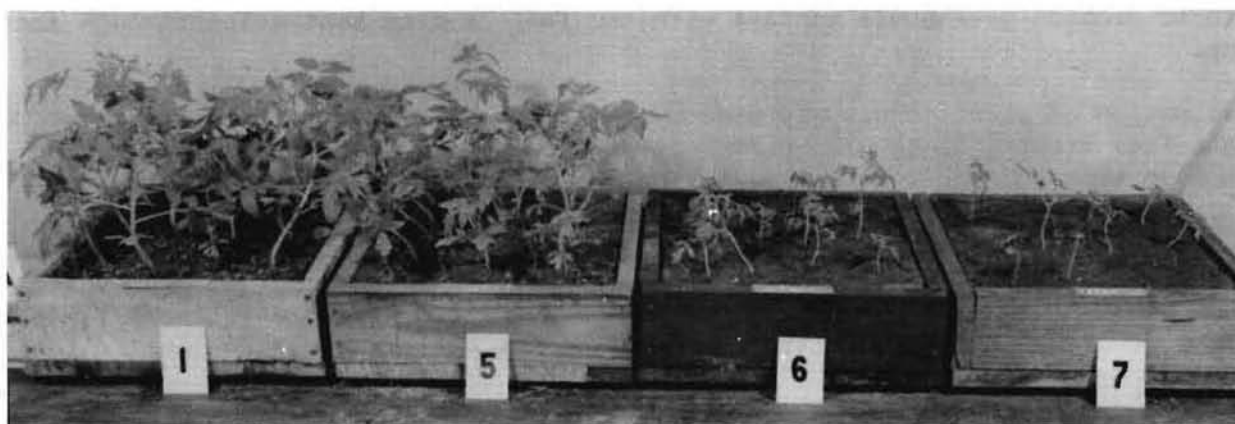
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plant to permit their use for treating wood for greenhouse flats or benches. Pine sapwood treated with copper naphthenate appeared to have about the same service life as cypress heartwood. Consequently, when the heartwoods of cypress, redwood, or western red cedar are available their use for this purpose would be preferred unless there was a large price differential.

If low cost supplies of nondurable woods are available locally, treatment by soaking for 10 to 20 minutes in a 10 to 15 per cent solution of copper naphthenate in Stoddard solvent or mineral spirits will impart considerable decay resistance. Lumber should be cut to correct length for flats prior to treatment and should be loosely stacked in a well ventilated heated room in winter or outdoors in summer for a month or so before using. Since petroleum solvents are toxic to plants their elimination by evaporation prior to use of treated wood is important.

Effect of Preservative Treatment

Treatment	Retention lbs./cu. ft.	Amount of Injury to Tomato Plants				Condition of Flats at End of 4 Years
		1st year	2nd year	3rd year	4th year	
Pentachlorophenol - 5% in Stoddard Solvent	.70	Severe	Light	None	None	No decay, all usable
Pentachlorophenol - 5% in No. 2 Fuel Oil	.50	Severe	Moderate	Light	None	No decay, all usable
Copper Naphthenate - 10% in Stoddard Solvent	1.20	Trace	None	None	None	Slight decay, all usable
Copper Naphthenate - 10% in No. 2 Fuel Oil	1.10	Light	Trace	None	None	Slight decay, all usable
Erdalith	.50	Trace	None	None	None	No decay, all usable
Tanalith	.50	Light	Trace	None	None	No decay, all usable
Celcure	.75	Light	Trace	None	None	No decay, all usable
Chromated Zinc Chloride	.75	Moderate	Light	None	None	Slight decay, all usable
Borax	2.50	Severe	Moderate	Light	None	Severe decay, none usable
Creosote	8.00	Severe	Severe	Moderate	Light	No decay, all usable
Untreated Sap Pine	--	None	None	None	None	None usable after one year
Cypress heartwood	--	None	None	None	None	Slight decay, all usable



Injury to tomato plants by preservatives used in treating flats. Plants of flats one and five show no injury whereas those of flats six and seven show severe injury.