

## TESTS WITH TREE PACKING MATERIALS

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Some type of material is generally used around the roots of planting stock when preparing containers for shipping. The most widely used material is sphagnum moss. This common plant is located in swamps and bogs throughout the North Temperate Zone and is generally available because of its wide distribution in the natural state. The moss has high moisture-holding capacity making it a suitable medium for packing purposes. It is now a commercial item and generally used throughout the country in forest nurseries.

In New York during the first decades of the century, planting stock was packed in large willow baskets along with the moss. Trees imported from Europe during the period were handled in the same way. Later, and until the postwar period, wooden crates were used. At present, the trees are rolled into paper-covered bundles of convenient size. The moss or other packing material is used moist around the overlapping roots in the center of the bundle; the tops of the trees are exposed on both ends. If the bundle is compact, loss of moisture from the trees should be reduced, less moisture might be required, or less moisture-holding material might be necessary.

In order to test certain packing materials, an experiment was conducted at the Saratoga Nursery of the New York State Conservation Department in 1960. Freshly dug Norway spruce 3-year seedlings were used. All tree bundles were treated alike from the time of packing to outplanting. All bundles were rolled on May 2, using three packing materials: sphagnum moss, excelsior, and chopped hay. Sphagnum moss is the regular commercial product supplied by a firm in Wisconsin and comes air-dried in bales weighing 13.5 pounds each. Waste excelsior consists of woody scraps, generally in lengths short for excelsior, and considered a byproduct of excelsior manufacturing. The wood species is usually popple or some other light wood. The chopped hay is a local product used for animal feeding.

The first planting was made on May 16 and the last on June 8, in the vicinity of the Saratoga Nursery. While awaiting planting, which was done every week except the first 2 weeks, the trees were stored in the packing shed. The bundles were, therefore, out of the sun, but were subjected to a temperature variation of from 50° to 70° F. A survival check was made on July 20, 6 weeks after the last planting (table 1). Survival was high for

TABLE 1.--Survival<sup>1</sup> of planted Norway spruce held in bundles 2 to 5 weeks in three packing materials

1960 planting date	Held in bundles	Survival where packing material was--		
		Sphagnum moss	Excelsior waste	Chopped hay
	<i>Weeks</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
May 16.....	2	98.8	98.0	97.5
23.....	3	96.5	93.0	98.5
30.....	4	47.5	84.0	89.0
June 8.....	5	22.0	67.0	44.5

<sup>1</sup> Based on trees for each lot, taken on July 20, 1960, or 6 weeks after the last planting.

seedlings held up to 3 weeks in bundles, but heavy loss occurred when they were held to the end of 5 weeks. Since 3 weeks is considerably longer than trees are usually kept before unpacking, there seems to be little choice in the type of packing material to use. But the cost of the respective materials varies (table 2). These costs may vary also with local circumstances. The chopped hay might lack uniformity and not always be satisfactory, but the other two materials are fairly standard in price and consistency.

TABLE 2.--Weight and cost of three packing materials

Packing material	Weight per bundle of 500 trees <sup>1</sup>	Cost per ton (2,000 lbs.)	Cost per million trees
	<i>Ounces</i>	<i>Dollars</i>	<i>Dollars</i>
Sphagnum moss.....	6.8	<sup>2</sup> 285	121
Excelsior waste.....	14.2	35	39
Chopped hay.....	8.5	30	16

<sup>1</sup> Based on needs per bundle as the material is normally received.

<sup>2</sup> Based on \$1.99 per 13.5-pound bale air-dry.

The results agree with those of Mullin in Ontario. Mullin tested sphagnum and excelsior and concluded "the experiment showed no significant difference in mortality due to the moisture retaining materials tested. The choice of material then becomes a question of convenience and economics." He states that the cost of excelsior is about half that of moss.<sup>1</sup>

<sup>1</sup>Mullin, R. E. Moisture retaining materials for nursery stock packaging. Ontario Dept. Lands and Forests Res. Rpt. 34. 1956.