

PACKING FOREST TREE SEEDLINGS IN CLAY

D. L. Brenneman, Nursery Superintendent
Edwards State Nursery, Morganton, N. C.

Since our last meeting 2 years ago, the nurserymen of North Carolina are more convinced than ever that Kaolin-treated seedling roots have many advantages over the more common methods of packaging.

For those who were not at our meeting 2 years ago and who may not have read the previous papers on the Kaolin subject, I refer you to the following:

"New Packaging Methods for Forest Tree Planting Stock."
by Bill Bland.

"Current Studies on Clay Slurry Root Dips." by C. B. Davey.

Both papers were published in the 1964 Proceedings of Region-8 Forest Nurserymen's Conferences.

"Automatic Mudding of Seedling Roots." by D. L. Brenneman.
Tree Planters' Notes 71.

All three of these papers are still current and with time being a factor, I will only touch on what may be called "Kaolin Highlights."

First, let's review the reasons why North Carolina is sold on clay. There are 11 reasons.

1. Sphagnum moss has become more expensive each year.
2. Clay, not moss, can be used in mechanized operations.
3. No significant labor is involved to coat the seedling roots with clay.
4. No maintenance of bundles - no watering.
5. No special storage racks needed.
6. Less heating within the bundles.

7. No special cooling facilities needed.

8. Less molding within bundles.

Protects roots from drying out during planting.

Provides additional protection from drying out following planting.

Could be used as a carrier for additional nutrients.

The only complaint to date is the fact that the clay does get on your clothing and truck beds; however, it washes off quite easily.

I believe we will all agree that our primary goal is to produce good healthy seedlings and to package them in such a way that they will remain in a healthy condition. At the same time, we must consider an item known as cost. With labor such as it is and the cost of materials continuing on the rise, we find it necessary to simplify our operations, mainly through mechanization.

To meet these requirements our packages are made up in the following manner: The outside of the bundle is the conventional water-proof paper with a steel band at each end. Inside and next to the water-proof paper is a layer of unfinished fabric for absorption purposes which helps to keep the clay from drying. A packing stick and the clay-treated seedlings complete the bundle.

The costs involved per bundle of one thousand are very interesting.

<u>Material</u>	<u>Seedlings per unit</u>	<u>Cost per unit</u>	<u>Cost per M bundle</u>
Clay	380,000 per ton	\$15.27	\$ 0.040
Fabric	90,000 per roll (600 ft. - 20" wide)	13.35	0.148
Water proof paper	30,000 per roll (300 ft. - 24" wide)	3.95	0.132
Packing stick	1	-	<u>0.020</u>
		Total cost	\$ 0.340

Before drawing any cost comparisons, it is imperative to determine the tree species involved. The above costs represent packaging for one shipping season (1965-66) at Edwards Nursery, which ships mainly 2-0 white pine. It has a massive root system that requires twice the

paper per thousand as does loblolly. The above costs were derived from the shipping of 7,000,000 white pine; 4,000,000 southern pines; and 250,000 yellow-poplar.

During the past 3 years, we have found that there is quite a difference in the absorption capacity of Kaolin from different sources. For example, this past shipping season we used one-third less kaolin to achieve a slurry of the same consistency as during the past season when kaolin from a different source was used. I mention this only as a point of interest as clay adds such a small amount to the cost per thousand.

It is apparent from the above costs that some substitute for the fabric liner would be desirable.

Conclusions

With the clay method of packaging forest tree seedlings, it is possible to eliminate practically all labor in the handling of the packaging media (clay). At the same time a product is reaching the planter that can be handled more carelessly without drying out, a factor that is probably the most important reason for using clay. To the nurseryman, the fact that he does not have to build special controlled storage rooms, rotate and water the bundles which are usually on special racks, nor worry about the wetting or freezing of moss, and less concern about molding or heating during shipment makes clay a desirable packaging media.

Added information

Source of: Fabric liner - Bonlinn Brand Non Woven Fabric, by
Chicopee Manufacturing Company
New Brunswick, New Jersey

Clay - Bell Kaolin Company
Road 39
Bat esburg, South Carolina

SUMMARY AND CONCLUSIONS

By: S. P. Darby

In summary, we can conclude that all package methods discussed do a good job of keeping trees, if prepared properly. We can further conclude that the choice of the packing method depends on the local needs of a particular nursery. Items that one should consider in choosing a packing method are:

1. Method of distributing seedlings.
2. Length of haul.
3. Storage conditions of packages in the field.

4. The needs of planting crews.

One can safely say that the choice of a particular packing method is a matter of economics. When choosing a method of packaging, however, one should look further than the actual material cost involved. This can be misleading. The amount of labor used in preparing packages of seedlings for shipment is certainly a major cost item. Frequently, it is possible to eliminate several nursery laborers by choosing a particular method of packaging. Should this occur in your operation, it would be a major factor in assisting you to select a particular system of packing. This, however, would not appear at a later date, if one simply calculated material involved and labor used in preparing a specific type package. For example, during Georgia's peak planting years, when large amounts of seedlings (200 to 300 million) were being shipped, the use of the wire-bound crate saved considerable labor. Six nurseries used 83 employees and 18 air-operated strapping guns when making the Forest Service type bales. Revised methods of grading, packing, and shipping - using the crate - were put into operation and 46 employees (with no strapping guns) replaced the above crew and equipment.

The writer has a few thoughts that he would like for you to consider:

--What results could one expect if seedlings packed in Kraft-polyethylene bags received a mud-slurry dip of roots 'prior to placing them in the K-P bag?

--Could moss be eliminated when packaging with K-P bags and mud?

--Perhaps cotton batting could replace moss when using the K-P bag?
It may work, why not try it?

In conclusion, we could say that each nurseryman should review his operation. Just because you have a good system, don't feel that it is a must that you continue to use it. Examine your operation, see if you can benefit by a new method of packaging. See if you can decrease your packaging cost and at the same time give the planter in the field a better protected seedling. Why grow high quality planting stock that has been carefully groomed and specially graded, if we are not going to give it the best possible protection that can be found?

Discussion

Q. (King) Should you let the seedlings drip dry?

A. (Brenneman) No. The faster they are placed in the bundle, the better.

PACKAGING COST DATA FOR VARIOUS MATERIALS AND LABOR USED IN PACKAGING
1,000 FOREST TREE SEEDLINGS. (BASED PRIMARILY ON SLASH AND LOBLOLLY
PINE).

Type	Item				
	:Water-proof :paper, bag, :box and :liner	:Moisture :holding :media	:Strapping :steel and :seals	:Baling :strips :	:Labor :
Forest Service bale ^{1/}	0.08	^{6/} 0.10	0.021	0.017	0.086
Cotton batting ^{2/}		^{7/} 0.102			
Wire-bound crate ^{3/}	0.78	0.125			0.038
K-P bag ^{4/}	^{8/} 0.176				
Clay ^{5/}	0.132	0.188		0.02	

^{1/} Data from C. A. Muller, Alabama Department of Conservation.

^{2/} Data from R. A. Jordan, Florida Forest Service.

^{3/} Data from Mack Neal, Georgia Forestry Commission.

^{4/} Data from V. B. MacNaughton, U. S. Forest Service.

^{5/} Data from D. L. Brenneman, North Carolina Forest Service.

^{6/} Based on locally collected moss.

^{7/} Based on packing an average of 130,000 trees per roll of cotton.

^{8/} Based on cost of \$176.00 per M -- Bag cost of \$255.00 per M quoted in Georgia.