NEW PACKAGING METHODS

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Mr. Chairman, Fellow Nurserymen, and Visitors:

I have been asked to talk to you about Mississippi Kraft-polyethylene bags and methods of packaging forest nursery stock.

I have had one year of experience packaging nursery stock in kraft-polyethylene bags. Others among us have had more experience than I. To begin with, let us describe this packaging. The bag, produced by Bemis Brothers Manufacturing Company (P. O. Box 1110, Mobile, Alabama), is 24 x 11-1/2 x 30 inches (1/50 wet strength) and polyethylene lined.

I have found that at least five conditions should be met when packing seedlings in bags of this description.

1. Seedlings should be dormant.

2. Seedlings should be cool and dry, except roots.

3. Moss should be cold and excess water allowed to drip from it before use.

4. Seedling roots should be moist but not dripping wet. If there is too much moisture in the bags, seedlings will turn dark; and if they stay in storage very long, they will go through a heat.

5. Seedlings should be stored under refrigeration. Along this line I should add that we are not equipped for cold storage. So, we try to coordinate our packing by this method with shipping dates so as to hold seedlings for a minimum amount of time (eg., over night).

When we have prolonged cold weather, and that is hard to predict in our locality, we can extend this short holding period somewhat.

I would like to state here that too cold weather is hard on seedlings when they are packed in conventional bales. When the weather is cold and humidity low, seedlings are going to do some drying out. Conversely, when you have a warm humid period, the seedlings are liable to go through a heat and mold. Should this happen, it would be better to destroy seedlings rather than transplant.

I fully believe there is a great future in seedling storage using kraft-polyethylene bags, provided cold storage is used. It would be nice if we all had refrigeration in which to hold seedlings. For large planting operations, public or private, cold storage would be profitable in

view of better seedling survival. However, the small landowners can not afford such an investment. Large planters or contractors using polyethylene bags should provide cold storage between 34° and 40°F.

Now, let us get down to the business of packing the seedlings in these polyethylene bags. We had to make some minor departures from our usual method of packing. In conventional packing we use the "round table method" which consists of three steps: FIRST, preparation of paper and moss for receiving the seedlings; SECOND, actual packing of seedlings; and THIRD, rolling and strapping the bale. For this NEW METHOD we set the bag upright on a small platform. Then a small amount of damp, cool moss is spread in one edge of the bottom of the bag. Next, we lay a bundle of 100 seedlings in the bag with roots on the moss.

Roots of the next 100 seedlings are reversed (i.e., placed on the opposite side of the bag) and covered with a small amount of cool, damp moss. This routine, alternating bundles of 100 seedlings each, is repeated until 1,000 seedlings are packed in each bag. Now the bag is sealed with a portable sewing machine. Since these polyethylene-lined bags are not strong enough to withstand much handling, an outer wrap of our regular waterproof wrapping paper is applied and secured with steel tape (Signode, 3/8 x 0.015) around the middle of the bag. The package is now ready for shipment or storage.

Using the pallet method of seedling storage, we put 5 packed bags on a pallet, lay two 1 x 4 S.4S. strips across them and then add another 5 bags of seedlings. Then that pallet is ready for the rack if seedlings are not shipped out on the same day of packing. We prefer to stack seedlings on the trucks and deliver them directly to refrigerated railroad cars for shipping to the planting project. Thus far, in Mississippi, we use this bag method only for the Yazoo and LT. Flood Prevention Project which is headquartered at Oxford, Mississippi.

Finally, and in a passing manner, I would like to consider materials which are now available on the market and being used as a substitute for sphagnum moss. I am concerned because of the constant rising cost of sphagnum. I can remember when the moss cost S0.25 per bale plus freight. Now it costs us $1.58 per bale. One substitute material which we have used is known as Barnhardt Fiber Tree Wrap (Barnhardt Manufacturing Company, Charlotte, North Carolina). It shows good promise. If this material proves entirely satisfactory from the standpoint of seedling survival, cost, etc., it will put the moss suppliers to thinking. Since this tree wrap fiber is made of cotton, its development and use offers a new outlet for another surplus commodity. Dan River Mills (Danville, Virginia) makes a similar product known as Riverlon Tree Seedling Wrapper No. 190. I have not used any of this material, but literature descriptions suggest to me that it is competitive.

As long as the materials are economical, what we use and how we use them are important only in terms of transplant survival. This is our goal. However, I need to add that we need a lot of support from the handlers and planters. These people must do their part by taking good care of the seedlings after they leave our hands.

DISCUSSION TO: R. A. Jordan and C. W. Walley

Q. They have been using moss for years, is there any history of the disease you mention? (Reference to slides shown by Jordan).
A. (Jordan) We've had it 4 years, but not the last 2 years. The doctor has put us on a strict washing schedule, about 4 times a day; and since, this schedule has eliminated the disease. This is a constant supervisor's job.

Q. Why don't you use a fungicidal solution?
A. (Jordan) That might be practical but will probably wash off.

COMMENTS by Mr. Hitt:

Many people may be fooled by this term "mud", but this is a tested formulation.

COMMENTS by Mr. Russell:

One thing seemed important to me was the fact that we lose survival, not so much in baling and carrying the bale, as when the tree comes out of the bale and gets put in the ground. As was pointed out, by the use of that bentonite clay dip they left seedlings in the sun for long times and planted them and they grew.

COMMENTS by Mr. Jordan:

I can mention an instance where the Florida Forests Foundation had two Eucalyptus seedlings which when bare-rooted nonnally don't live. They were potted extras. They were picked up and the dirt knocked off and left for 2 days. They were then planted and they lived. We can take them right from the bed and out-plant them and unless planted in less than 15 minutes, they won't live; or unless the weather conditions are just right. You always have extenuating circumstances. However, I was impressed. In north Florida if slash pine are handled and out-planted correctly, they should not lose more than 10 percent--under practically any weather conditions that exist in Florida. I'm not, of course, referring to the desert areas.

COMMENTS by Hr. Hitt :

Although this was discussed in the east for use on conifer seedlings, it may have use on hardwood seedlings.

COMMENTS by Mr. Jordan:

I plan to put in a study comparing the use of moss versus mud this winter.

Q. How do you pack this polyethylene bag? Do you alternate moss on roots and tops?
A. (Walley) Put the wet moss just on the roots. Alternate layers of seedlings. That is, roots to tops.

COMMENTS by Mr. Little:

I only use three layers of moss: moss, and say 500 seedlings, moss, etc. Bundles of 500 are alternated as previously mentioned.

COMMENTS by Mr. Gehron:

We have tried most of these articles talked about and always go right back to peat moss. Right now we are using half peat and half rice straw, Of course, we chop both to fine particles and pre-soak for 24 to 48 hours and use that for packing. We have found it very satisfactory. We have tested it and found no difference in seedling survival.

Q. Was it necessary to use cold storage with polyethylene packaging?
A. (Walley) Yes, I have stored some for 5 weeks at room temperature and planted them but have not had the chance to check them yet.

COMMENTS by Mr. Russell:

Ursic who has done the study on polyethylene packaging at Oxford Research Center said they have held some for 9 weeks without cold storage; planted, and got no difference in survival. He, however, recommended not over 8 weeks.

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