Use of Kraft Bags for Shipping of Tree Stock

Stu Slayton*

I wish to take this opportunity to thank the State of Iowa and Jerry Grebasch for the invitation to the meeting and the excellent hospitality.

At the Tourney Nursery in Watersmeet, Michigan we began using the kraft bag for the first time in the spring of 1970. For several years we had read about the kraft bag being used by reading reports in "The Tree Planters Notes". A friend of mine employed by Continental Can Corporation in Louisiana uses the kraft bag extensively for loblolly pine with excellent results . Also, our neighbor to the east Carlton Hollister, Nursery Superintendent of Wyman Nursery stated he had good results with the kraft bag.

Up until 1970 we had used the open-end bale wrapped with 12 ounce burlap or sisal kraft paper tied with plastic twine and baling slats. Sphagnum moss was shredded and mixed with aspen wood chips at a 4-1 ratio. The clincher to convert to the kraft bags occurred when two cases of Sporotrichum Schenckii occurred in 1968 followed by four additional cases in 1969. We at the nursery felt obligated to the safety of our employees and the increase in number of contract planters who had a difficult time comprehending the preventive measures to avoid Sporotrichosis. Medical reports state this is an occupational disease leaving the door wide open as to the legal aspects as to our responsibilities in using a carrier of an occupational disease.

The time was ripe for change. We were confident in the kraft bags, but as a service unit we had to have the field planting units accept the bags Prior to shipping any bags of stock to the field we instructed the field of our intentions and developed stringent rules for handling and storage of stock.

INSTRUCTIONS FOR HANDLING PLANTING STOCK IN KRAFT LAMINATED BAGS

1. Do not puncture bag. If puncture occurs, plant these trees first or patch bag with tape, or have extra bags available to transfer trees to, roll bag top and tie with string.

2. Do not store in sun or heat. Attempt to store as close to 34°F as possible.

3. Do not open bag to water; there is enough water, in bag and stock can be watered by turning bag each day,

4. Plant oldest stock first. Do not carry for more than five days. 3-1/2 days is more desirable, especially if cold storage facilities are not available or if weather is warm.

*Nursery Superintendent, Tourney Nursery, Watersmeet, Michigan 49969

Maintain the highest possible humidity.

6. Do not stack bags as heating can occur.

7. When hauling or storing stock in field, cover stock with light colored canvas, so in event rain occurs the bag is not weakened and broken open in subsequent handling.

After the first use of the kraft bags in 1970 the field comments were as follow s:

1. Less time in handling and watering stock.

2, Less mess at planting site and at storage site.

3 Bags were cleaner thus making easier to rent available commercial refrigeration.

4. Easier to transport.

Easier to mail as contents were less than 40 pounds. This past spring we air mailed American elm and red oak in the bags to Alaska for a planting study. In return correspondence they stated the stock was in excellent condition for a later than expected planting date. First year success was excellent.

Trees stay moist longer.

Adverse comments:

1. Somewhat bulkier.

2, Heavy rain weakens bags thus necessitating extreme handling care.

3, Semi-tractor hauling a large load for 300 miles had trouble with the bottom layer of bags tearing on rough bed, We have corrected this by laying plastic over rough load beds to permit the bag to slide slightly without tearing.

Nearly twenty ranger districts receiving stock unanimously stated the bags were preferred over the previous method of open end bales

Some of the nursery advantages we have found are the reduction of costs for other material. In savings on materials and labor we have saved approximately $1.00 for every bag that is shipped out over the open end bale method. We have found the bags to lessen the amount of materials handling, materials storage space, promote a cleaner work area at point of packaging trees and most of all eliminates the risk and responsibility of Sporotrichosis occurring. Also the number of graders per conveyor table has been increased from 12 - 20.

A brief description of our grading operation is the trees are brought into the storage in tubs. Upon entering the stock processing area,water by sprinkling or by a mist system is applied through the tops so the roots have a greased effect. By this I mean the nursery soil clinging to the roots is not washed off but is moistened enough so when trees are threaded the roots slip apart easily without tearing or removing soil particles from the roots.

The seedlings are graded, counted, roots threaded, and placed on an endless conveyor belt in bunches of 10. Near the end of the conveyor belt the root pruner gathers together five bunches of ten trees and prunes the roots back to a 6"-8" length by means of an Eastman clothbolt cutter. A bunch tier takes the bunch of 50 trees at the end of the belt and positions the bunch in a cone and pulls over a #32 rubber band. After placement of the rubber band the bunch is placed on a revolving "Lazy Susan Table". The tree packer takes the bunch-tied trees and places it in a kraft bag held by welded rods on another revolving "Lazy Susan Table" by means of a two inch paper clip. The roots are placed in the middle of the bag. Depending on size of stock the bag will hold 500 transplants to 750 seedlings . The only packing medium within the bags is 1/2 pint of water prior to placement of stock. At half completion and completion of filling the bag another 1/2-1 pint of water has been added. This water is not necessary, but is made available to stock that may not be planted right away. Watering is accomplished by simply turning the bag and permitting the water to drain through the roots to keep moist.

The bag is then given to the sewing machine operator who sews the bag. This particular machine is a model M-100 medium duty sewing machine mounted on vertically adjustable stand unitized with a conveyor. The cost of this machine from Doughboy Industries at New Richmond, Wisconsin, is approximately $1500.00. The thread used is 12/5 with #25 needles. The only trouble we have had to date is trying to get too much into the bag causing breakage of the sewing needles and loopers. This machine can be operated very easily even with inexperienced help. Usually 1-3 days of operation and operator is nearing full capacity of sewing operation.

As to bag characteristics we use a sewn open mouth bag 23" across , 5" wide and 40" long. The bag is 3 ply with 50 Natural Kraft Wetstrength with a moisture barrier interlineron the middle ply facing the packaged stock. This interliner retains the moisture in the bag. The interliner is on the middle ply so in the event sun rays are directed on the bag the interliner does not come in direct contact with trees. The 1/2 - 1 mil polyethelene barrier can be 50 or 100 raybar coating (manufacturers designation). We use the 50 raybar which permits for grams of moisture vapor to transmit per 100 square foot per 24 hours at 100 F and 90% R. H. This is determined by General Foods Test using GFMVTR as moisture vapor transmission rates. The 100 raybar coating permits less moisture vapor to be transmitted. Oxygen and other gases will penetrate the barrier liner but at a lesser degree. We have found this to be very important in overwintering of stock. We have had good success with overwintering of stock for 4-5 months with 50 or 100 raybar coatings. It appears the barrier liner does not permit enough transmission of anerobic gases and oxygen. Storage of white spruce stock in excess of 5-6 months with bags sewn closed caused needles to turn an ashen gray and survival was very poor. To alleviate this the manufacturer recommends having the barrier liner perforated with holes 2" - 3" on center. This is essentially what the cement industry has had to do to permit passing of gases so the bags will not blow up. These perforations will still maintain moisture retention to a high degree.