

PACKING IN BOXES MAKES GOOD CENTS

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Abstract.-- Packaging seedlings in crush-resistant, corrugated kraft boxes generally improves the efficiency of packing operations and meets customer needs. Operations such as filling boxes, labeling, strapping, storage and distribution are made easier. Boxes provide excellent protection against rough handling, temperature extremes and moisture loss. Cost of **boxes is** competitive with other types of packaging. Customer surveys indicate a preference for quality seedlings packed in attractive durable boxes.

INTRODUCTION

Nurserymen and foresters alike, recognize the most critical period in a seedling's life is from the time it is lifted until it is outplanted. Individual events affecting survival during this period may seem insignificant, but the cumulative effect can have a significant impact (Lantz, 1987). Foresters are now using computer models to determine return on investment for reforestation activities and are recognizing how much quality seedlings properly packaged can mean to initial stocking and their bottom line.

International Paper started evaluating different types of seedling packages in 1978. About 1983, we designed a strong, water-resistant, corrugated kraft seedling box called "TREEPACKTM" which improved the efficiency of packing operations, prevented seedling damage from rough handling, temperature extremes and moisture loss, and was reasonably priced. In 1987 we began using white boxes with improved graphics and customizing graphics for our external customers. The following discussion will provide an overview of how the boxes fit our packaging and distribution process.

LIFTING AND PACKING

Seedlings are lifted with J.E. Love seedling harvesters and placed in canvas slings (jelly-roll style) with roots end to end. Slings are transferred to racks on a haul-in trailer and transported to our packing shed. The racks are color coded by seed lot and placed in the cooler to begin chilling.

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^{2/} The mention of a company or trade name does not imply endorsement by International Paper.

Racks are removed as needed to maintain production and are placed at the head of the double-deck grading line. Seedlings are removed from the slings and placed all in one direction on the top conveyor and moved to the grading stations. Graders take seedlings from the top deck, grade as needed and carefully place all in one direction on the bottom conveyor. Seedlings are then moved to the boxers.

Box bodies and lids are shipped flat in bundles of 250 and 500 respectively. Bodies and lids are folded and stapled (stitched) together by contract labor using a box stitching machine. Regular boxes are 11"x15"x22" and "deep" boxes are 13"x15"x22". Workers average making over four boxes per minute. Once constructed, bodies are stacked for labeling. Completed lids are placed near the strapping station.

Stick-on labels with freezer grade glue are printed by computer. The person labeling simply peels off the label and places it on the lower left hand corner of the box. The box is then placed on a conveyor which delivers it to the boxers. The boxes are within easy reach of all four boxers.

The boxes are placed on a hanging scale platform and small double handfuls of seedlings are placed in boxes all in one direction. A protective hydrogel is then sprayed on the root system. The process continues until the box is full. The regular box holds approximately 850 seedlings and the "deep" box will average 1000. Filled boxes are pushed onto a moving conveyor or roller bed and delivered to the strapping station. Here the lids are placed on the boxes and clear plastic straps are placed around the box in both directions. Strapping in two directions pulls the lid down against the box body providing a tight seal to protect against moisture loss. Boxes are then stacked on tagged racks with or without shelves and stacked in a cooler at 34 degrees Fahrenheit.

DISTRIBUTION

Seedlings are delivered by common carrier or International Paper refrigerated vans. Boxes are stacked either on double-decked seedling racks or individually, one on top of the other. Trucks can carry approximately five hundred thousand seedlings per load.

Customers that have loading docks and fork-lifts usually prefer rack shipments because one man can unload the entire shipment in thirty minutes. Hand loads can be made easy to handle by using roller beds **to move the boxes out of the truck to the waiting handlers. Boxes can be stacked four to five high usually without any crushing.**

Our seedlings are stored under a variety of conditions once they leave the nursery. Most of our customers use refrigerated storage in some form, but there are some that do not have cold storage and prefer to "hot plant" their seedlings instead. Protection in the field is also varied. Some of our customers have found that problems associated with environmental conditions in the field can be reduced by using the insulated boxes. For example, one forester reported that during an inspection of a planting operation he found boxes that had been exposed to direct sunlight for three hours. Outside air temperature was 80 degrees Fahrenheit and inside the box it was only 45 degrees Fahrenheit. He was a very pleased customer!

COST

Costs of seedling boxes like International Paper's TreePackTM box will range from eighty cents to one dollar per box depending upon shipping distance, graphics, etc. We have found that the added protection, ease of handling, and customer satisfaction have more than paid for any incremental cost difference between other types of packaging and our box.

SUMMARY

Quality has been defined as "fitness for purpose" (Willen and Sutton, 1980). Based on our experience, a tough, water-resistant, corrugated kraft box like TreePackTM, fits the definition of a quality seedling package. Boxes can reduce the effects of the various risk that seedlings are exposed to during critical times. Our internal and external customers have been pleased with the boxes performance. Packing and distribution operations have been made easier and more efficient. Boxes offer a good alternative to other forms of seedling packaging.

LITERATURE CITED

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