

INCREASING PRODUCTION OF NURSERY STOCK BY IMPROVEMENTS IN  
BUNDLING AND PACKING

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Increases in the cost of production, particularly labor cost, make it necessary to mechanize our nursery operations as much as possible. Mechanization usually means a speed up of work or a reduction in the length of time from seedling or transplant bed to finished bundle of trees. Such reduction in time not only cuts the cost of production (if crew is same size) but also reduces the chance of roots drying out through exposure to air and sun.

The present layout of the packing shed here at the Russ Nursery was developed to increase production of nursery stock without adding to the cost (fig. 1).

In 1955, the grading table designed by P. W. Robbins of Michigan State College (Jour. Forestry 40: 809-811. 1942) was transferred to Russ Nursery. In the spring of that year, we found trees could be handled more quickly by

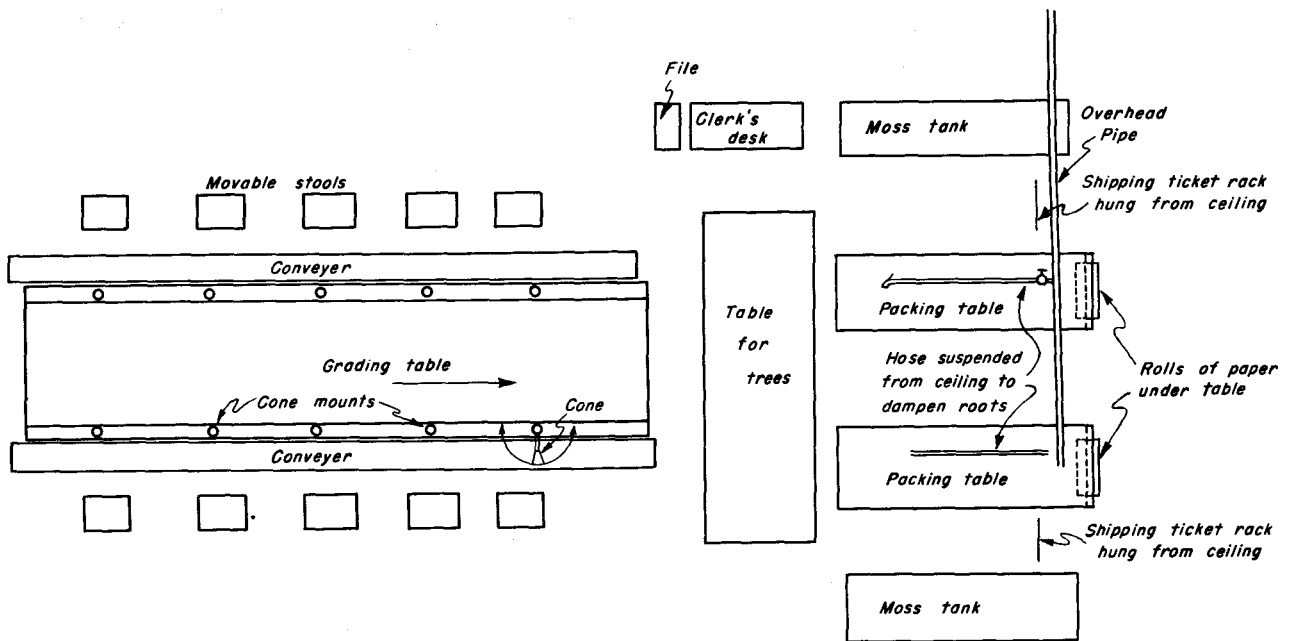


Figure 1. - Packing shed floor plan.

counting 25 and placing them on the endless belt than by placing two trees per mark as described by Professor Robbins in his article. The trees were picked up by a worker at the end of the line, two bundles of 25 combined, tied by an automatic tier, and placed in a wooden rack which contained 10 spaces. Thus 500 trees were placed in one rack. This rack was removed when full by the two men packing on the packing table.

Several problems arose. Packers were unable to keep up when handling certain species, the automatic tier had breakdowns and we could not get all trees out within the shipping time period. While this method did increase average daily shipment over that of previous years, it was still too slow to handle the volume of stock which had to be shipped. The crew averaged 70, 000 trees per day shipped. It was evident the method had to be modified because, except for dribble orders, shipping was not completed until May 6.

In 1956, modifications were made on the grading table. The racks along each side which held boxes and seats for sorters were removed and replaced by conveyers. Wooden stools were constructed for the counters, and metal cones, one per counter, were mounted on the sorting table.

These metal cones are a modification of those described by Professor J. T. May, A.P.I. Ag. Expt. Sta., Auburn, Ala., in Tree Planters' Notes No. 18, December 1954. Each cone was 12 inches long overall, 6" in diameter, and welded onto a 1-inch union for easy removal from a pipe which acted as rubber band storage and support (fig. 2). In the fall of 1956, new cones as described by J. T. May, 5 inches in diameter and 12 inches long with no cylinder were installed (fig. 3). A 4-inch cone was found to be too small.

Each counter counts out 50 trees, inserts roots in cone, holds the bunch of trees with his left hand, pulls rubber band off cone with his right index finger onto tree bundle (a small finger groove enables worker to do this without fumbling with the rubber band), and tosses bundle on table. We have found that the #31 rubber band is best with the 6-inch cone; #29 and #30 break too often when pulled over this cone. The #29 or #30 bands work well with the 5-inch cone which we now use for nearly all stock except red pine transplants.

Using this system meant reorganizing the crew. The person on the tier was free for other duties and it was necessary to have two packing tables with 3 packers to handle the flow of trees. The crew consisted of 18 or 19 people: 4 or 5 pullers, 10 graders (one of whom transferred trees from sorting table to storage table when sorting table was filled), 3 packers, 1 clerk. One puller drove the loaded truck to the express office. Average production rose to 120, 000 trees per day shipped, with 175, 000 the highest in one day.

Packers rolled the trees in waterproof paper, with sphagnum moss, by hand. The center man, alternating between the two tables, helped roll and tie the bales on both. While two men were rolling and tying a bale, the other packer laid out moss and trees; by the time he had his bale ready for rolling, the center man was ready to help him roll and tie it.

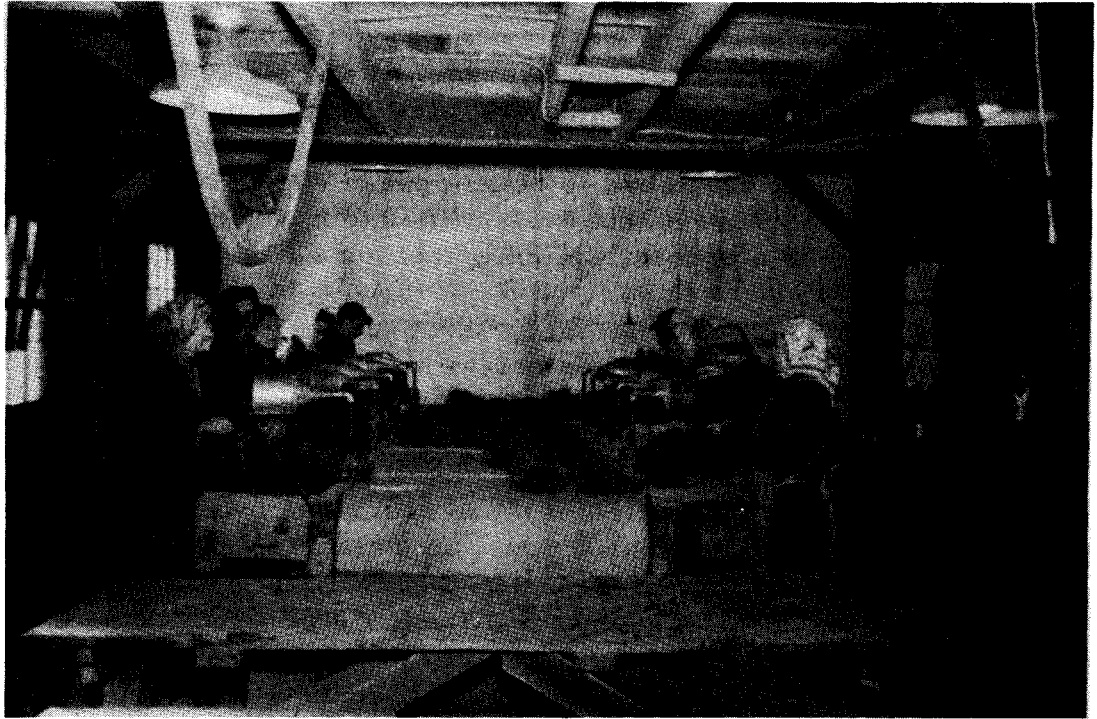


Figure 2. - Counters working with 6-inch cylinder type cones.

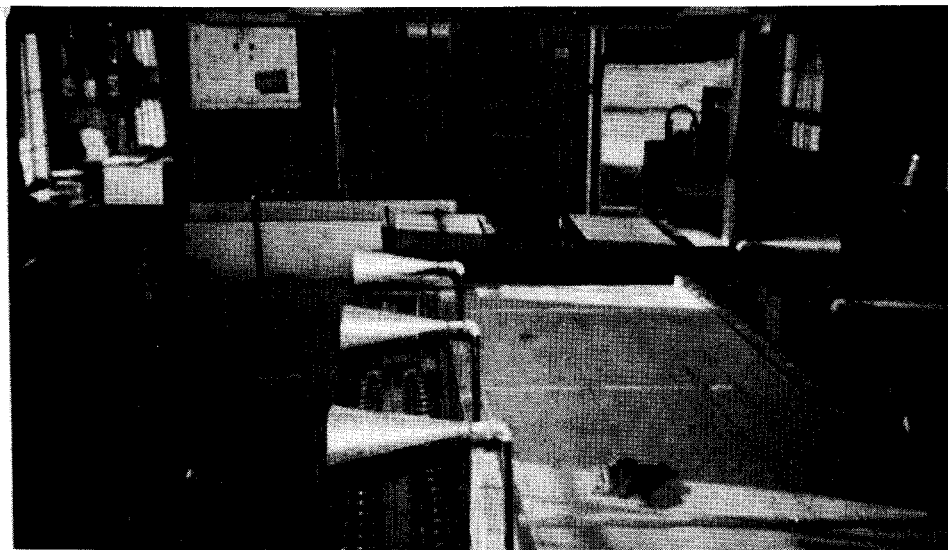


Figure 3. - Present arrangement with 5-inch, cylinderless cones.

Confusion and mixup in getting the proper number of trees baled for each customer had been experienced in previous years. With the addition of a second packing table, we knew more confusion might result unless we adapted our method of handling shipping tickets to packer technique. In addition to customer name and address, the number of trees per bale he is to receive is typed on the ticket. Ten small spring clips were nailed to a board and tickets for one bale of trees inserted in each clip by the clerk. Four such boards were made so that the clerk could be filling out express bills and putting tickets in two while packers were working from the other two. The boards, filled with tickets, were hung in a location for convenient plucking by the packer, who referred to ticket for number of trees for that bale before getting bale ready.

With this setup we can run over the table and pack two species at once. There is no chance of mixup with one species per side of table and each packing table handling a separate species. This avoids any need for stock piling except when two or more species must be packed in one bale. Usually, however, the orders are large enough to pack mixtures in separate bales.

In 1955 it took 25 days to get out 1, 583, 000 trees with 12 people. In 1956 it took 18 days to get out 2, 176, 000 trees with 18 people. In 1955 the average daily wage for workers was \$1.28 per hour, in 1956 this rate had risen to \$1.36 per hour. The change in method of packing, however, resulted in a reduction of 12 cents per thousand trees in cost, as indicated in the following tabulation. This 12-cent saving when multiplied by the number of trees shipped comes to \$261, which more than offsets the \$35 the cones cost.

	<u>1955</u>	<u>1956</u>
<b>Trees shipped per day . . . . .number . . .</b>	70,000	120,000
<b>Crew . . . . . do . . . . .</b>	12	18
<b>Man-hours per day . . . . . do . . . . .</b>	96	144
<b>Rate per man-hour . . . . .dollars . . . .</b>	1.28	1.36
<b>Crew cost per day . . . . . do . . . . .</b>	122.88	195.84
<b>Cost per M trees shipped . . . . . do . . . . .</b>	1.75	1.63

We are now working on plans to increase efficiency of moving trees from grading table to within reach of packers mechanically, but these are not yet developed.