ROLLED TREE SEEDLINGS

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Review of Literature

Seedling survival through the first critical years has long been maintained by application of soil and nutrients. Downs (1) describes a method used since the late 1930's by the Soil Conservation Service Nursery at Albuquerque, N. Mex. Seedlings were potted in tar paper liners at the nursery for 1 year before fieldplanting. Johnson (2) describes a similar pot developed about 1936 at the U.S. Southern Great Plains Field Station of the Agricultural Research Service. In 1953 Miller (3) planted root rolled seedlings of Scotch pine near Lafayette, Ind., and obtained good results.

[1] This article was written while the author was working at the Forest Service's Wind River Nursery at Carson, Wash.

Rotty [2] suggested the use of specially packaged sandwich trees, but trials were unsuccessful.

Earlier Use of Rolling Method

Packaging trees individually by the rolling method perhaps was first suggested by Samuel Miller (4) of the Oregon State Board of Forestry in the early 1940's. Miller spent considerable time and effort in developing a semiautomatic tree rolling machine patterned on a cigarette roller; it has a rubberized linen blueprint belt. He also developed and patented a planting tool to handle these specially packaged trees (4). Planting production for rolled trees was much greater than that obtained using the conventional planting bar or mattock. A private reforestation company in Oregon has used the rolling machine developed by Miller for planting stock on certain contract areas.

Various types of paper have been used to wrap the seedlings. Several grades of lightly waxed tissue paper were tried by Miller (4). Standard GSA toweling was used at the Forest Service's Wind River Nursery, Carson, Wash. Papers ranging from blotters to heavily waxed and tarred papers have been used with varying success. Of course, the paper must have sufficient strength to withstand handling and wet strength properties, since most soil is used in packing the seedlings. Once planted, the paper must also decompose rapidly.

Wind River Nursery Studies

Tree rolling machines made at the Wind River Nursery Shop were used (fig. 1). They cost $25 and are manually operated.

About 50,000 rolled seedlings per year have been produced at the nursery. The cost of this packaged stock is high compared with that for regular bare-rooted stock. Labor expenses represented approximately 80 percent of the cost of the packaged trees. About 16 percent was for the stock. The package materials cost almost 4 percent. The packaged trees are placed in wooden boxes prior to shipment.

An attempt was made to reduce the labor requirements. Under the system being used (fig. 2), linoleum paste was applied to the

[2]Rotty, Roland. Correspondence on file, U.S. Forest Serv„ Region 6, Portland, Oreg. 1958.

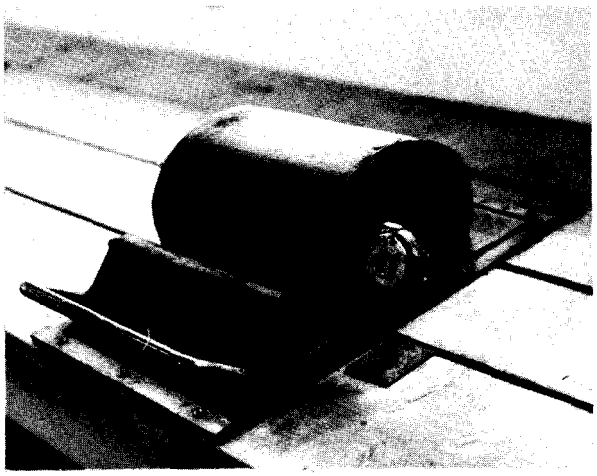

Figure 1.--Manually operated tree rolling machine developed and built at Wind River Nursery. Machine is all steel with rubberized canvas roller belt. Tally counter is mounted on bench to permit accurate counting of rolled trees.

Figure 2.--Soil mixture is spread in small fold behind roller; seedling roots are placed in fold with tops extending to side and the exposed roots are pruned, additional soil is then added. Paper toweling is laid flat on large curved area above fold. Handle is pushed up and away, paste is applied to toweling, and the finished roll is "kicked" off the back of the roller.

flap. By eliminating the pasting, production might be increased. Therefore, several paper companies were asked to develop a special packaged paper for the rolled tree operation. One company[3] produced a satisfactory seedling wrap with contact adhesive strips on opposing faces of the paper. The cost was approximately $3.50 per thousand, depending on the quantity purchased.

In April 1961, 1,000 sheets of this special paper were tested. Production of wrapped seedlings increased output 85 percent, from 700 to 1,300 seedlings per man-day. The wrapped seedlings were then randomly interplanted with bare-rooted stock and rolled seedlings, using the paper towel method. In September 1961 survival of the packaged trees was good; it did not significantly vary between the two papers used.

The main purposes of the outplanting were to determine how well the wrapping paper withstood rough handling under wet conditions and to determine how rapidly it broke down after planting. Root penetration through the paper was generally poor. As growing tips touched the wrapping paper, they were forced downward. This might be alleviated by use of coarser, more loosely fibered paper with perforations. Under field conditions the adhesive material held up extremely well and did not lose its strength.

On planting areas in the Western United States where severe summer droughts occur, a paper impervious to the penetration of roots might be desirable. Forcing the roots downward before their lateral transformation would place the growing root tips in a more favorable moisture regime and might possibly increase survival.

Literature Cited

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