

FIELD PACKING OF SOUTHERN PINE SEEDLINGS AT THE
COLUMBIA NURSERY

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Abstract.--Implementation of field packing of pine seedlings at Columbia Nursery was successful despite problems. The Louisiana Office of Forestry decided to try field packing as a method of increasing seedling quality by reducing exposure time of roots to drying air and as a method of reducing labor required to harvest the seedlings.

Modification of existing equipment and purchasing new equipment was necessary.

Problems encountered included ensuring the proper number of seedlings per bag and developing an alternative system for use during times of unfavorable conditions.

The necessity to hire large numbers of seasonal workers, and the long transition time from lifting to packing of seedlings, are two problems that tree nurseries have experienced for many years. Efforts to reduce the number of workers through the use of machinery have been relatively successful in the past and different methods of caring for lifted seedlings, prior to packing, such as covering and misting, have helped. However, after twenty-four years of operation, seedlings at the Louisiana Office of Forestry (LOF) Columbia Nursery were still held for hours before they were packed.

In an effort to reduce the magnitude of these problems, field packing was implemented at Columbia. This decision was made after observing a field packing demonstration and many hours of deliberation on the advantages and disadvantages.

During the summer of 1981, two Grayco seedling harvesters were modified to accomplish field packing. The 1975 model Grayco required extensive modification including the raising of the conveyor table on the personnel carrier to the proper working height and building an extension onto the rear of the carrier. The extension was necessary to increase space for the packing equipment. Extra structural braces were added to help support the weight of the extension and additional personnel. Other modifications were performed to update the older carrier to ensure smooth operation. Both the 1975 and the new 1981 model personnel carriers were covered with a fiberglass roof to protect the seedlings from the sun, and for employee convenience. Electrical wiring and hoses for transferring the superabsorbent material were installed on each harvester.

To carry the superabsorbent, tanks were purchased to mount on the front of two tractors. Each polyethylene tank was mounted and connected to a centrifugal pump. The pump was attached to the tank mounting frame and belt driven from the tractor's alternator. Installation of a double-belt pulley on the alternator was necessary. The pump, equipped with a 12 volt d.c. activated magnetic clutch, may be engaged and disengaged as desired. A belt driven pump was chosen in preference to a gasoline engine driven pump to reduce the associated maintenance.

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This type pump is capable of 55 gpm at 40 psi, which is sufficient to provide material to the rear of the personnel carrier for packing, and to provide recirculation for agitation of the superabsorbent material in the tank.

For counting purposes, a spring scale was hung in the packing area of each carrier, but early in the lifting season these proved unsuitable due to variations in the number of seedlings per bag. These scales were replaced with another type of spring scale, then a platform balance, and finally with an electronic platform scale.

Two twelve volt d.c. operated sewing machines were purchased and suspended on the rear of the carrier for closing the K-P seedling bags.

Old seedling trailers were rebuilt to accept Jarke stacking pallets so that bags of seedlings could be loaded directly onto the pallets in the field. When full, the pallets were taken to the cold storage facility and unloaded with a forklift.

During discussions prior to the decision to implement field packing, three major concerns surfaced. First, since the Grayco harvester works poorly in wet silt loam soils such as that at Columbia, could an alternative system be developed for use during periods of excessive soil moisture. This problem was faced twice during the 1981-82 season and was dealt with by hand lifting, then packing on the Grayco carrier. This method, although not highly productive, did suffice until normal operations could resume.

Another major concern was the problem of grading the seedlings while field packing. Due to the high rate of production per person, very little grading could be done. The damaged or evidently small seedlings were culled, but borderline size discriminations could not be made. This problem was not considered major, but efforts were made to see that each bag contained at least 1000 plantable seedlings.

The third problem faced was how to ensure that each bag contained 1000 plantables. Solving this problem was important because of the large number of small orders processed at Columbia. The electronic scales proved to be effective for providing the accuracy necessary. After installation of these scales, bag count deviation from 1000 plantables averaged less than five percent.

The following table shows the cost of equipment and modifications necessary to implement the system at Columbia. The additional harvester was required to maintain the necessary production rate. Normal production from one harvester during 1981-82 was approximately 300,000 per day.

Cost of Implementation	
1. Grayco Harvester	\$19,600
2. K-Tron electronic scales	7,000
3. Tanks and mounting racks	805
4. Ace centrifugal pumps	465
5. Fischbein twelve volt sewing machines	1,200
6. Equipment modification	2,400
(steel, fiberglass, hoses, wiring, etc.)	
7. Labor (estimated)	<u>1,600</u>
TOTAL	<u>\$33,070</u>

The goals set for field packing were achieved and additional benefits realized. Time between lifting and packing was reduced to about three minutes as compared to hours when using the packing shed method. This reduction of root and foliage exposure to the air should result in better seedling condition.

Field packing proved to be a viable method of reducing labor cost. During each of the three years preceeding field packing, an average of 80 seasonal workers were employed to harvest an average 30 million seedlings. In contrast, the 1981-82 crop required only 43 workers to harvest 27 million seedlings. (These average figures also include the labor used to lift and pack approximately 600,000 hardwood seedlings each year.) When adjusted for the crop size difference, 27 million seedlings were field packed with a savings of \$21,290 relative to the previous year.

A serendipitous result of field packing over shed packing at Columbia, was that normally low-productive workers produced at a higher rate due to a more favorable worker to supervisor ratio. Morale of nursery administrative and supervisory personnel was higher also.

The LOF considers field packing at Columbia a success and will continue this process. Efforts will be made to further improve the system and further reduce costs. In addition, plans are being made to field pack at Louisiana's other nurseries.