

## SEEDLING STORAGE IN BALES

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Care of nursery stock between lifting and planting has been the subject of many experiments to determine the effects of various treatments on survival. All recognize that seedlings are quite sensitive to environmental conditions encountered from the time they are lifted from the nursery beds to the time they are set in their new and permanent spot in the forest stand.

Unfortunately, stock mishandled during the time it is out of the ground cannot be identified visually, except, of course, where it has been burned severely by overheating or the roots dried to such an extent that the larger laterals are shriveled. Stock may be slightly damaged in one operation, such as by unnecessary exposure in lifting at the nursery, and yet not affected materially. A second exposure during planting operations, such as exposure to warm drying winds, may result in a significantly lower survival. To attempt to evaluate one specific treatment often gives negative results because damage to seedlings is clearly cumulative. A small amount of damage in one operation added to that occurring before or after may cause serious losses in survival.

Field heel-in beds have long been suspected as a major cause of damage. All too often insufficient ground preparation and improper soil texture in locations far removed from an adequate supply of water cause stock to deteriorate. Roots may become dry in excessively drained soil or sour in poorly drained areas, thus causing heavy mortality. Roots placed in shallow trenches distort the normal position to such an extent that it is impossible to plant them correctly.

In 1952 trials were started to determine the possibilities of holding 1 -year-old seedlings in bales. Subsequently carefully controlled experiments were initiated to establish optimum storage conditions for periods up to 4 to 5 weeks. It was found that survival of baled stock kept in a cool place, and watered at frequent intervals, gave an equal or higher survival than identical stock heeled-in in the best possible manner up to the full length of the period. In other words, stock could be stored in bales with complete confidence provided it is given adequate care.<sup>1</sup>

Baled stock is placed on racks spaced to allow air circulation around bale (fig. 1). Air circulation around the bale is necessary to prevent heating. Water is added to the sphagnum moss around the roots by inserting a small slender perforated tube attached to the water hose (fig. 1).

Where there is danger from freezing temperatures, a wide variety of buildings have been used. Barns, garages, sheds, and even basements can be fitted with racks for storage purposes. A small heater is sometimes used during cold spells to keep the stock from freezing. The advantages of storing in this manner are twofold. (1) Better survival is obtained because seedlings are given better protection. (2) It is cheaper. The cost of heeling-in varies from 8 to 10 cents per thousand, while the cost for storage and care in bales is around 3 cents per thousand, including rental of buildings and construction of racks.

The practice of storing seedlings in bales is now a standard practice throughout the South. Only a minor amount is kept in heel-in beds.

<sup>1</sup> Ursic, S.J. Bale storage effective for loblolly pine seedlings. Jour. Forestry 54: 815-816. illus. 1956. Bale storage of loblolly seedlings. Southern Forestry Notes 103. 1956.

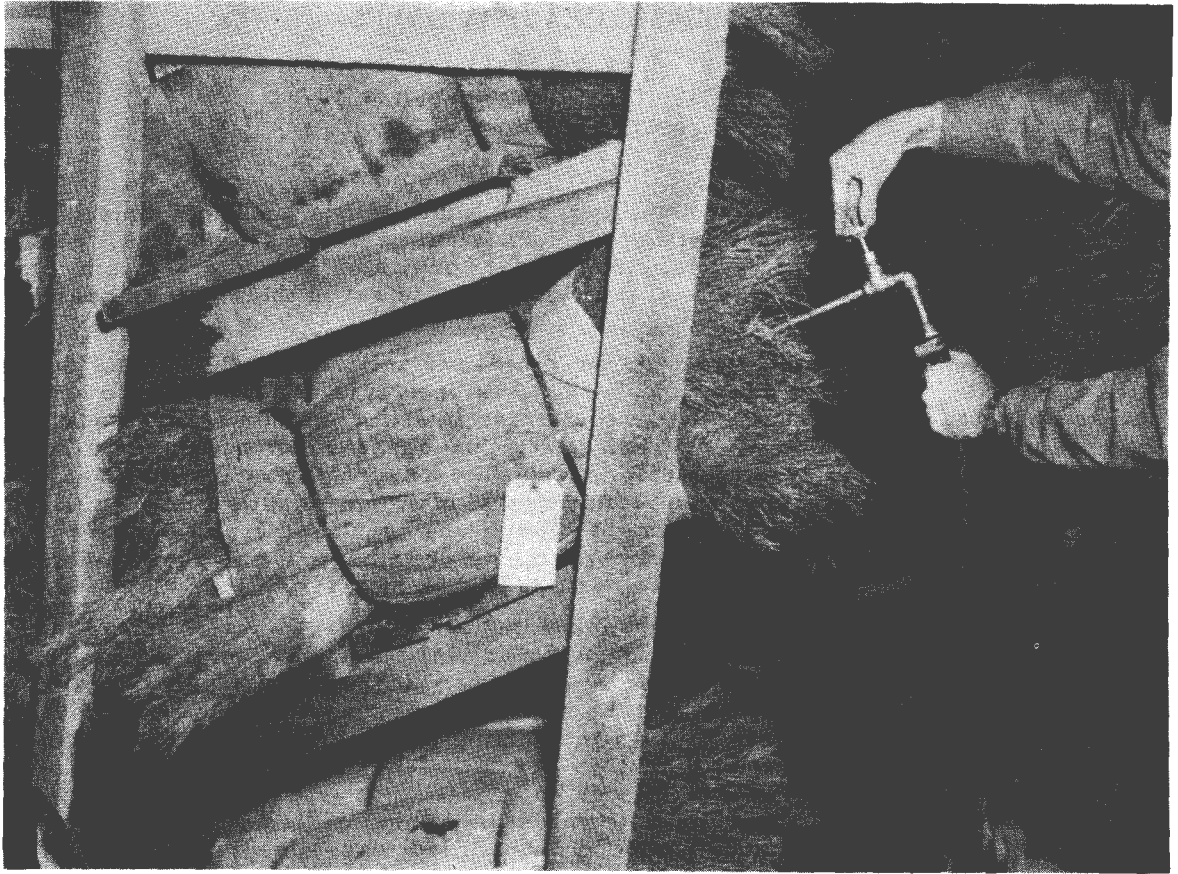


Figure 1.--Standard bales of 2000 loblolly seedlings well spaced on storage racks in unheated warehouse are watered every 2 or 3 days.