Field- and Shed-Packing of Slash Pine Nursery Seedlings: Effects on survival and growth

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Abstract. Currently, two bare-root seedling packing systems are practiced in southeastern forest tree nurseries: field- and shed-packing. Field-packing seedlings immediately after lifting may subject them to less stress. However, this method also results in the outplanting of some lower quality seedlings which would normally be culled during the grading process. Shed-packing may include grading the nursery stock prior to packing which eliminates morphologically inferior seedlings, but the added handling and stress necessitated by this process may adversely affect seedling survival and growth. A study conducted at two Florida nurseries attempted to quantify differences in both physiological stress and field performance between field- and shed-packed slash pine (*Pinus elliottii* Englem.) seedlings. At each nursery, seedlings were both field- and shed-packed, and then graded by stem diameter. Shed-packed treated seedlings were graded and packed after several different time intervals. Field-packed seedlings were graded in a cooler with minimal exposure to stress. Xylem pressure potential and root tissue production of ethylene were measured to characterize seedling physiological quality during the packing processes. Seedlings were planted by grade at both a moist flatwoods and dry sandy site. Date of bud-burst was recorded for seedlings at both sites. One year after planting, survival and height and diameter growth were assessed by grade, treatment and nursery. After one year, grade one seedlings from both nurseries showed significantly greater survival, total height and diameter than grades two and three. On both sites, for all three grades, field-packed seedlings burst bud significantly earlier than shed-packed seedlings. Field-packed seedlings also demonstrated greater first year survival than shed-packed seedlings. On the dry sandy site, field-packed seedlings had significantly greater total diameter than seedlings graded and packed within two hours of lifting. Nursery by treatment interaction was detected at the moist flatwoods site. However, at both sites, field-packed seedlings at Nursery One consistently had greater total height and diameter and survival than shed-packed seedlings. Treatment effects on field performance did not vary when seedling grades were weighted differently.