

Root wrenching and lifting date of slash pine: effects on morphology, survival, and growth

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Abstract. Slash pine (*Pinta elliottii* Englem.) seedlings were subjected to three wrenching treatments: 1) One root wrenching in early August; 2) Three root wrenchings in early August, September, and October; and 3) No wrenchings. Seedlings were then lifted on five dates between November and February based on the number of chilling hours accumulated. All wrenched seedlings had reduced shoot dry weight, smaller shoot-root ratio, and smaller stem diameter and height. These morphological differences translated into improved survival as well as increased diameter and height growth when measured one and two years after planting. Only seedlings wrenched three times demonstrated improved root fibrosity. Furthermore, only multiple wrenched stock showed no survival differences between seedlings subjected to drying stress prior to planting and those that were not. At the time of lifting, seedlings lifted latest had greater stem diameter, increased root dry weight and number of root tips, and improved shoot-root ratio. However, no survival differences were detected across lifts, and those seedlings lifted earliest demonstrated the best height and diameter growth.