

### **Date of Shoot Collection, Genotype, and Original Shoot Position Affect Early Rooting of Dormant Hardwood Cuttings of *Populus***

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#### **Abstract**

Identifying superior combinations among date of dormant- season shoot collection, genotype, and original shoot position can increase the rooting potential of *Populus* cuttings. Thus, the objectives of our study were to: 1) evaluate variation among clones in early rooting from hardwood cuttings processed every three weeks from shoots collected throughout the dormant season and 2) evaluate variation among genomic groups in early rooting of the same cuttings while testing for differences among three parental shoot positions (apical, middle, basal). We tested 22 clones belonging to six genomic groups ([*P. trichocarpa* Torr. & Gray x *P. deltoides* Bartr. ex Marsh] x *P. deltoides* 'BC', *P. deltoides* 'D', *P. deltoides* x *P. maximowiczii* A. Henry 'DM', *P. deltoides* x *P. nigra* L. 'DN', *P. nigra* x *P. maximowiczii* 'NM', *P. trichocarpa* 'T'). Cuttings, 20 cm long, were processed from shoots collected every three weeks beginning 1 Dec. 2003 until 9 Apr. 2004 from stool beds established at Hugo Sauer Nursery in Rhinelander, Wisconsin, USA (45.6 °N, 89.4°W). We measured number of roots and root dry weight from harvested cuttings after 14 days of growth. The interaction between date of shoot collection and clone governed both traits ( $P < 0.0001$ ). In general, clones exhibited the best rooting when cuttings were processed from shoots collected on or after 23 Feb. 2004. The interaction between date of shoot collection, genomic group, and shoot position governed number of roots ( $P = 0.0348$ ) and root dry weight ( $P = 0.0262$ ). There was broad variation in number of roots and root dry weight of apical, middle, and basal cuttings within and among genomic groups across dates of shoot collection, with 15 Mar. 2004 being an important date because differences among positions began to develop or changed relative to earlier dates. Thus, for increased plantation establishment potential with similar genotypes, we recommend collecting stool shoots no sooner than the end of February and matching cuttings of specific shoot positions to each genomic group.

**Key words:** *Populus* genomic groups, hybrid poplar, adventitious rooting, genotype x environment interaction, whip, stool bed.