Mound Layering of Selected *Acer saccharum* subsp. *grandidentatum* Accessions©

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INTRODUCTION

Bigtooth or canyon maple, [*Acer saccharum* subsp. *grandidentatum* (syn. *A. grandidentatum*)], is of interest due to its potential use in low-water landscaping. It is a difficult plant to propagate vegetatively and more efficient propagation may facilitate both the introduction and commercial production of new selections from the wild. Bigtooth maple is known to propagate itself naturally by layering. The objective of this study was to evaluate mound layering as a means of vegetatively propagating selected accessions of mature bigtooth maple trees.

MATERIALS AND METHODS

Rooted cuttings of five accessions of mature wild bigtooth maple (USU-ACGR-1001, 1002, 1003, 1004, 1005) were established in a mound layer bed at the Utah State University Botanical Center in Kaysville, Utah from 2008 to 2010 (Fig. 1). Stock plants were placed in rows by taxon with 6 ft (between rows) by 3 ft (in row) spacing. Alley ways were covered with weed barrier; with conifer shavings used as a mulch and mounding material. Stock plants were partially mounded in early summer of 2011 and on 11 July plants with at least four shoots were selected for layering. Mounding material was removed and each of four shoots per plant were randomly assigned a treatment of either a girdle, rooting hormone, or both girdle and rooting hormone applied to the stem base, or an untreated control. Girdling was done by tightly applying a 4×0.10-in. cable tie as low as possible on the stem. The hormone treatment consisted of 4000 ppm IBA and 2000 ppm NAA as Dip'N Grow® in 25% ethanol applied with a cotton swab to the basal 1-in. of the shoot. Shoots were then mounded with conifer shavings. Stock plants were sprinkler irrigated for 5 min twice daily. Rooted layers were harvested on 28 Oct. 2011 by cutting the stem at the base (Fig. 2). Roots per shoot and percent rooting were determined and data analyzed using a generalized linear mixed model using SAS PROC GLIMMIX. Roots per shoot were analyzed using a square-root transformation. Percent rooting was determined by counting each shoot as a binary response and modeling based on probability of rooting.

Fig. 1. Bigtooth maple mound layer bed with conifer shaving rooting substrate.

Fig. 2. Roots on layered shoots of bigtooth maple at harvest (28 Oct. 2011).

RESULTS AND DISCUSSION

These results indicate that both girdling and auxin application can increase the percentage of rooted layers with bigtooth maple, and that combining the two treatments together results in a significant increase in percent rooting and roots per layer (Figs. 3 and 4). We conclude that mound layering, in combination with a rooting hormone and stem girdling can be an effective means of propagating mature bigtooth maple.

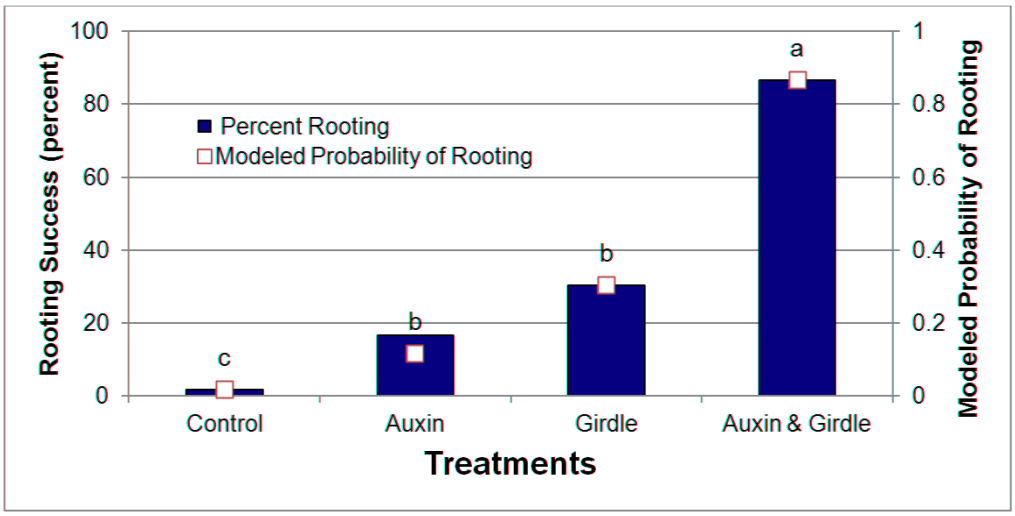

Fig. 3. The effect of auxin (4000 ppm IBA and 2000 ppm NAA as Dip'N Grow® in 25% ethanol) and girdling; either singly or combined on the percentage of rooted shoots when layering bigtooth maple. Means of modeled data with a different letter are statistically different as based on analysis using PROC GLIMMIX with each shoot being a binary response and modeled as probability to form roots.

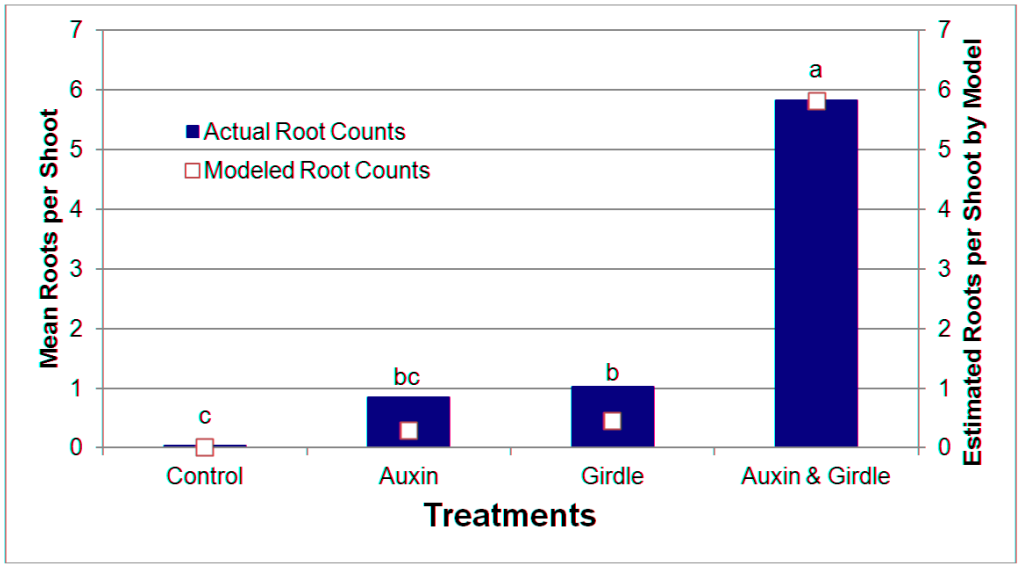

Fig. 4. The effect of auxin (4000 ppm IBA and 2000 ppm NAA as Dip'N Grow® in 25% ethanol) and girdling; either singly or combined on the average number of roots per shoot developed when layering bigtooth maple. Means from modeled data with a different letter are statistically different as based on square-root transformed data analyzed with GLIMMIX.