Collecting *Acer grandidentatum* Clones in Northern Utah: An Overview©

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INTRODUCTION

Bigtooth, or canyon, maple (*Acer grandidentatum,* syn. *A. saccharum* subsp. *grandidentatum*) is a native western tree with great potential for use in low-water, sustainable landscaping. Our goal is to select and propagate exceptional clones for such use. The challenges are locating high-quality specimens, establishing them as clones, and evaluating their potential for both production and landscaping.

Locating, Selecting, and Establishing Potential Tree Specimens

In order to increase the size of the selection pool, we are using aerial images to survey a large geographical area by selecting for red fall color. We have photographed images as red-green-blue (RGB) color composite and true color images, in addition to images found on Google Earth®. Through geo-rectification of selected photographs and matching with Google Earth® images, we are usually able to determine latitude and longitude of trees and then locate them using a handheld Global Positioning System mapping navigator, printed digital images, and, where appropriate, a pocket PC coupled with Handheld Geographic Information System software by StarPal™ that shows the real-time location of the PC on a digital image of the search area. Once located, trees are evaluated for crown size and form, leaf morphology, disease resistance, and other characteristics in addition to fall color.

It has been challenging to collect scions from wild trees and successfully establish them in a nursery environment. Our greatest success to date has been to collect budwood during July and early August and immediately chip bud onto coppiced seedling rootstocks with multiple stems. Buds are placed on multiple stock shoots, the same diameter or slightly larger than the budwood, and then tied with Parafilm® grafting tape. With this method, we have been able to obtain over 50% success with budding of either nursery-grown or wild plant material (Table 1).

With an ultimate goal of commercial use, the question remains which propagation method is best for growth of *A. grandidentatum* in both the nursery and landscape. Current options include budding onto seedling sugar maple (*A. saccharum*) or canyon maple rootstocks, or using adventitious roots. Previously, we have shown that juvenile canyon maple can be successfully rooted by layering and hypothesize that it can be an effective method for propagating mature trees as well. In order to establish a stooling bed of adventitiously rooted mature scions, we have taken cuttings of mature maples growing on seedling rootstocks. Using a technique of modified etiolation and banding, dormant buds were covered with an open-ended velour bag (Fig. 1) and allowed to develop until they had emerged from the bag, or

were covered with closed bags that were removed and replaced with a Velcro® band (Figs. 2-3). With either system cuttings were etiolated at the base when cut (Fig. 4). When such cuttings were wounded and given a 5-sec quick dip of 4000 ppm IBA and 2000 ppm NAA as Dip'N Grow® we were able to attain 25% rooting overall (data not shown).

DISCUSSION

Using aerial imagery, we have successfully located and established trees that otherwise would not have been discovered. But, challenges to effective use of this technique include geo-rectification, improved image resolution to better judge overall tree quality remotely, and describing the relationship between image color and actual fall color. There are also challenges in propagation efficiency and determining which root system is most effective.

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Table 1. Percentage budding success with various scions of *Acer grandidentatum* on coppiced seedling rootstocks.

Date budded	Selection	Total budded	Total take	Success (%)
5–6 July 2007	USU-ACGR-1007	19	14	74
5–6 July 2007	USU-ACGR-1008	14	14	100
4 July 2007	USU-ACGR-1005*	40	25	63
3 July 2007	USU-ACGR-1999	10	10	100
2 July–13 Aug. 2007	USU-ACGR-1009	39	22	56

*Signifies nursery-grown scions.

Figure 1. *Acer grandidentatum* stock etiolated growth upon bud break.

Figure 2. Typical shoot development after emergence from open-ended velour bag. Base of stem remains etiolated.

Figure 3. Black Velcro® placed on the bases of etiolated shoots following removal of closed velour bags.

Figure 4. Cutting from open-ended velour bag treatment showing etiolated stem bases, leaf damage (presumably from heat), and stem for supporting vertical orientation of bag.