

# Rooting of Stem Cuttings of Mortonia scabrella

*D. A. Palzkill and L. DePaul*

## ABSTRACT

*Mortonia scabrella can be successfully propagated by stem-tip cuttings during May to September. Better rooting seems to occur during the less stressful months of May and September than in mid-summer. A wide range of rooting response occurs between different clones; the best will root in the range of 70-80%, which should be acceptable in a commercial propagation situation. In one cycle of selection in which the best 3 out of 16 clones were selected for a repeat study, average rooting success increased from 6% to 33%. Apparently genetic differences for rooting potential occur. Further selection from larger populations, and/or breeding for this trait should result in cutting propagation becoming relatively easy for this species.*

## INTRODUCTION

Mortonia scabrella is a small- to medium-sized evergreen shrub in the Celastraceae, or bitter-sweet, family. It is locally common in southeastern Arizona, and east to Texas. A form of this plant with larger leaves occurs in Havasu Canyon and in northern Mohave County and in nearby areas in Utah, Nevada and California. Mortonia has a green color uncommon among currently used ornamentals. It has no apparent cultural problems once established. Since in nature, it occurs in limestone soils of very high pH (over 9.0), it would likely do well in situations where alkaline soils are a problem.

Plants in nature exhibit a great diversity of forms, not all of which would be considered attractive by most people. Propagation from seed would likely result in the whole range of types. Selected individuals have a very attractive, neat appearance. They are heavily branched, resulting in a dense plant; the individual branches tend to begin ascending close to the branch point, resulting in a many-branched 'candelabra' effect. Development of an asexual propagation method will be necessary to allow propagation of such selected types. No published information is available on cutting propagation, or other asexual methods for this species. The objectives of this study were to determine whether Mortonia could be propagated by stem tip cuttings at different seasons of the year, and whether or not clonal differences in rooting potential exist.

## MATERIALS AND METHODS

An initial study was conducted to determine whether standard stem-cutting propagation techniques would work with Mortonia. Stem-tip cuttings were collected on May 5, 1986 from 11 plants growing near the north end of the Santa Rita Mountains approximately 20 miles SSE of Tucson. Plants selected were among the most upright growing in the population in this area. Cuttings were transported to the Campus Agricultural Center in Tucson, where they were trimmed to uniform length, treated with one of four concentrations of water-soluble indole butyric acid (K-IBA) (Table 1), and stuck in a 1:1, perlite:vermiculite rooting medium contained within galvanized metal flats. They were then placed under intermittent mist. Bottom heat was provided with a Biotherm bottom heat system set to maintain 70-75°F in the medium. Six weeks after sticking, cuttings were removed from the medium and evaluated for rooting. Results are given in Table 1.

In a second study, cuttings were collected from 16 additional plants growing in the same population in the Santa Rita Mountains on July 24, 1986. All cuttings were treated with 8000 ppm K-IBA, and otherwise treated as in the first experiment. Rooting results are given in Table 2.

In a third study, a second set of cuttings was collected on September 9, 1988 from 3 of the best-rooting clones from the second study. Cuttings were treated with either 2000 or 8000 ppm K-IBA, stuck in a 1:1, perlite:vermiculite, medium and placed under intermittent mist. After approximately 6 weeks they were removed from the mist bench and then maintained for another 6 weeks in a heated greenhouse. They were evaluated for rooting and survival on 12/3/86. Results are given in Table 3.

## RESULTS

In the first experiment, begun in mid-May, average rooting response of the 11 clones tested ranged from 0% to 65%. Only 3 of the clones rooted at 20% or better. For the 5 clones with highest rooting percentage, use of IBA resulted in an increase in rooting percent. The best rooting clone, number 10, had its rooting increased from 40% (without IBA treatment) to 90% (with 8000 ppm IBA treatment). Of the 11 clones, only this one had levels of rooting that would likely be acceptable for routine propagation use.

Table 1. Rooting (%) of stem-top cuttings of 11 clones of *Mortonia scabrella* treated with 4 concentrations of IBA (stuck 5/12/86).

Clone	IBA Concentration (ppm)				Ave.
	0	2000	4000	8000	
1	10*	10	20	15	14
2	0	0	0	0	0
3	0	0	0	0	0
4	5	20	35	20	20
5	0	0	0	0	0
6	5	5	5	5	5
7	10	25	20	15	18
8	5	10	0	0	4
9	30	45	50	15	35
10	40	65	65	90	65
11	15	20	0	5	10
Average	11	18	18	15	16

\*20 cuttings of each clone were used for each IBA treatment.

The second experiment also resulted in a wide range of rooting response between the 16 new clones tested. This study, which was conducted in mid-summer, resulted in a lower percent rooting for the best rooting clones. Of the 16 clones, the highest rooting percent was 29%, and the next best was 15%. It is possible that this was simply due to the different clones being tested and their lower rooting potential; however, the more stressful conditions occurring at the time these cuttings were collected in mid-summer may have caused a reduction in rooting potential.

Table 2. Rooting (%) of stem-top cuttings of 16 clones of Mortonia scabrella (stuck 7/24/86).

Clone Number	Percent Rooting*
1	4
2	29
3	11
4	0
5	5
6	4
7	7
8	1
9	10
10	1
11	3
12	4
13	0
14	1
15	15
16	1

\*All cuttings were treated with 8000 ppm K-IBA.

In the third study, when 3 of the better rooting clones from the second study were re-tested in mid-September using 2 levels of IBA, the rooting percent of 2 of the clones increased. Clone 3 increased from 11 to 77% (averaged over 2 treatments in experiment 3), and clone 15 increased from 15 to 23% (averaged over 2 treatments in experiment 3). Clone 2 had 29% rooting in experiment 2, and about the same (30%) in experiment 3.

Table 3. Rooting and survival (%) of stem-top cuttings of 3 clones of Mortonia scabrella treated with 2 concentrations of K-IBA (stuck 9/9/86).

Clone*	K-IBA Concentration	
	2000 ppm	8000 ppm
2	25	35
3	73	80
15	38	8

\*Same clones as used in experiment 2.