

# Air-layering as a Method of Asexual Propagation of Mesquite

R.H. Hagen and D.A. Palzkill

## ABSTRACT

*Three 12-year-old Prosopis chilensis were successfully layered in spring and late summer. The best rooting occurred with 1 cm stems treated with either 5,000 or 15,000 ppm IBA. Air-layers treated with IBA had a higher rooting rate and better root quality than untreated air-layers.*

## INTRODUCTION

Mesquites (Prosopis spp.) exhibit a wide range in characteristics when grown from seed. Both native and South American species readily interbreed, making it difficult to predict reliably the traits of the offspring. Most commonly, thornless 'Chilean' mesquite are preferred over those with thorns. However, when seed from a thornless mother plant is planted, the seedlings usually show considerable variability in the degree of thorniness. Asexual methods allow for the propagation of plants with consistent traits such as thornlessness. Air-layering is a method for the aboveground rooting of stems while still attached to the parent plant. This technique allows for small numbers of relatively large plants to be produced in a short time and often works when other asexual methods do not. In general, if a plant can be propagated by cuttings, it can also be layered. Air-layering is especially attractive because the frequent monitoring and specialized propagation facilities required for leafy cuttings are not needed.

Only one report of attempted air-layering has been found for Prosopis. Solanki, Kackar and Jindal (1986), working in India, successfully air-layered 40-year-old Prosopis cineraria. The objective of this study was to determine if air-layering could be successfully done on Prosopis chilensis, a common landscape plant in Arizona.

## METHODS AND MATERIALS

Stems approximately 1 cm in diameter were selected for layering. Leaves and side branches were removed from the region where the layer was to be prepared, and a ring of bark 2.5 cm long was removed from the stem. In treatments which included IBA, the IBA was first prepared in talc to the proper concentration and was applied as a moist paste with a paintbrush to the side of the wound closest to the branch tip. A split, moistened Kys-Kube (pressed peat, vermiculite and cellulose fiber) was applied around the wounded area and wrapped first with Parafilm to retain moisture and then with aluminum foil to reflect sunlight and protect the Parafilm. This procedure is a slight modification on traditional methods using sphagnum moss (Hartmann and Kester 1983), and was adapted from a report by Hare (1979).

In one study, which was begun in early April 1989, two levels of IBA (5,000 and 15,000 ppm) were evaluated on 3 individual 12-year-old plants of Prosopis chilensis growing in a Tucson landscape. Layers were evaluated for rooting at 5 and 8 weeks. Rooted layers were harvested and planted into 6-inch pots. They were then placed under shade and misted periodically for 1 week to allow the roots to grow out of the Kys-Kube and become established in the container medium.

In a second study, begun on August 16, 1989, 10 branches on each of the same three Prosopis chilensis plants were air-layered without any hormonal treatment and 10 were treated with 5000 ppm IBA. On September 20, 1989, the air-layers were harvested and evaluated for rooting.

## RESULTS AND DISCUSSION

In the first study, air-layering was highly successful on the three trees tested. Except when mechanical damage occurred during the wounding stage or from wind, 100% of the air-layers at both 5,000 and 15,000 ppm IBA were rooted. A difference in rooting rate was observed between the three trees; more than 90% of the air-layers rooted by week 5 on two of the trees but not until week 8 on the third. Rooted layers were easily established in containers and roots grew throughout the medium in 6-inch pots within 1 week after removal from the parent plant. Layered plants were shifted into 2-gallon pots 2 weeks after harvest and into 5-gallon pots 6 weeks later.

In the second study, the best treatment again gave a high rate of success, and clonal differences were again observed. Also, in this study, which compared 0 ppm to 5000 ppm IBA, the treatment with IBA was found to improve success greatly. In the best clone/treatment combination, 90% of the layers rooted (Clone PC2, treated with IBA). The only attempted layer treated with IBA on this clone, which did not root, had been wounded too severely during preparation and had died.

Overall, 22/30 (73%) of the layers treated with IBA rooted successfully by week 5, while only 3/30 of the untreated ones rooted. If the pattern observed in the first experiment is followed in this one, even a higher percent will have rooted by week 8 when this study will be ended. Also, the roots on the three untreated layers that rooted, were thinner and fewer in number than on layers treated with IBA.

A few layers also have been tried successfully on Parkinsonia aculeata. It is likely that Cercidium spp. and other Prosopis spp. also can be layered, since they can be rooted from cuttings (Hagen and Palzkill, unpublished data).

## SUMMARY

Mature trees of Prosopis chilensis were successfully propagated by air-layering in as short a time as 5 weeks. All layers except those which were mechanically damaged rooted well at both 5,000 and 15,000 ppm IBA. Layers treated with IBA rooted at a much higher percent than those not treated, and the quality of the root system also was much better when IBA was used.

## LITERATURE CITED

- Hare, R.C. 1979. Modular air-layering and chemical treatments improve rooting of Loblolly Pine. Comb. Proc. Inter. Plant Prop. Soc. 29:446-454.
- Hartmann, H.T. and D.E. Kester 1983. Plant propagation: Principles and practices. Prentice-Hall, Inc., Englewood Cliffs, New Jersey.
- Solanki, K.R., N.L. Kackar and S.K. Jindal 1986. Air layering in Prosopis cineraria (L.) Mac Bride. Indian Forester, March 1986, 202-207.