Use of K-IBA as a foliar spray for softwood cutting propagation©

T. Gregory and R.L. Geneve[a]

Department of Horticulture, University of Kentucky, Lexington, Kentucky, 40546, USA.

INTRODUCTION

Common softwood cutting propagation involves the application of auxin as indole-3-butyric acid (IBA) in talc as a quick dip to the basal end of the cutting. Alternatively, auxin can be applied as a foliar spray over the top of cuttings after they are stuck (McGuire and Sorenson, 1966). This method has become a viable alternative for commercial cutting propagation because it offers several advantages over traditional application methods. The major benefits of foliar IBA sprays are reduced labor costs and increased worker safety. Additionally, the auxin spray could be administered at potentially any time after sticking giving the producer increased flexibility in the production process. An auxin spray also avoids potential alcohol damage to the basal portion of cutting that traditional applications might exhibit.

This study utilized two species (*Hydrangea paniculata* 'Limelight' and *Rhus aromatica* 'Gro-Low') that were chosen based on their sensitivity to a foliar auxin treatment. The objective of this study was to determine the effects of auxin concentration and timing of application on the rooting of the two species.

METHODS AND MATERIAL

Cuttings of both species (*H. paniculata* 'Limelight' and *R. aromatica* 'Gro-Low') were sourced from Decker's Nursery, located in Groveport, Ohio. The cuttings were then transported to the University of Kentucky Horticulture Greenhouse where they were prepared and stuck. Both species were prepared for treatment identically to the production in Decker's Nursery. *Hydrangea* cuttings were cut to an average length of four inches and the upper two sets of leaves were left intact. *Rhus* cuttings were processed to leave five nodes per cutting. Over seven-hundred cuttings were prepared for each species and stuck into deep celled, nursery production 6-packs. The cuttings were divided into 11 treatment groups after preparation: IBA quick dip (5,000 ppm), single spray treatment the day after sticking (Day 2), on Day 4, and Day 6. Multiple spray applications were on Day 2 plus Day 4 and Day 2 plus Day 6. K-IBA concentration for *Hydrangea* was 1,000 ppm and *Rhus* at 2,000 ppm. Following sticking, the cuttings were placed in a mist bed with bottom heat and a misting interval of 10 seconds every 10 minutes. The entire mist bed was covered in a single layer of shade cloth to reduce heat load throughout the day.

The flats were treated by spraying the cuttings in the morning with a hand sprayer until the leaves were saturated and slightly dripping. The K-IBA solution was allowed to completely dry on the leaves before misting was resumed. *Hydrangea* cuttings were evaluated 17 days after sticking, while *Rhus* cuttings were evaluated after 30 days. Cuttings were evaluated for roots per cutting and cutting quality was estimated on a scale of 0 to 5 where 0 was unrooted and 5 had numerous elongating roots. A subsample of rooted cuttings was transplanted to the greenhouse and evaluated after 2-months for branching and shoot length.

RESULTS AND DISCUSSION

In *Hydrangea,* the foliar K-IBA application was more effective for rooting than a quick dip, except when treated with 1,000 ppm the day after sticking (Figure 1). The best rooting occurred with a treatment of 2,000 ppm the day after sticking with 94% rooting and an average of 40 roots per cutting. The remaining applications exhibited good rooting as well,

[a]E-mail: rgeneve@uky.edu

but the applications of 1,000 ppm K-IBA performed better than applications of 2,000 ppm. Hydrangea responds well to foliar applications (Blythe et al., 2003) and the suggested concentration is between 500-750 ppm (Kroin, 2009). The efficacy of the auxin spray compared to a quick dip at similar concentrations is supported by Drahn (2007), working with several different cutting types. However, *Hydrangea* cuttings did not root well at the lower auxin concentration the day after sticking (18% rooting and 2.3 roots per cutting at 1,000 ppm). This indicates that while a lower concentration may be sufficient, the cuttings needed to fully acclimate to the misting environment to root without a higher auxin concentration. This may be partly explained by the delay in sticking following transport of the cuttings that could have led to lower foliar auxin absorption.

There were no significant differences in *Hydrangea* rooting when auxin application was delayed for up to 6 days after sticking (Figure 1). There was also no obvious additive or synergistic effect observed in rooting with multiple auxin sprays. From a practical standpoint, these data provide a window for initial auxin sprays where auxin remains effective for rooting and also indicates that there is no incentive for multiple foliar treatments in *Hydrangea* cuttings.

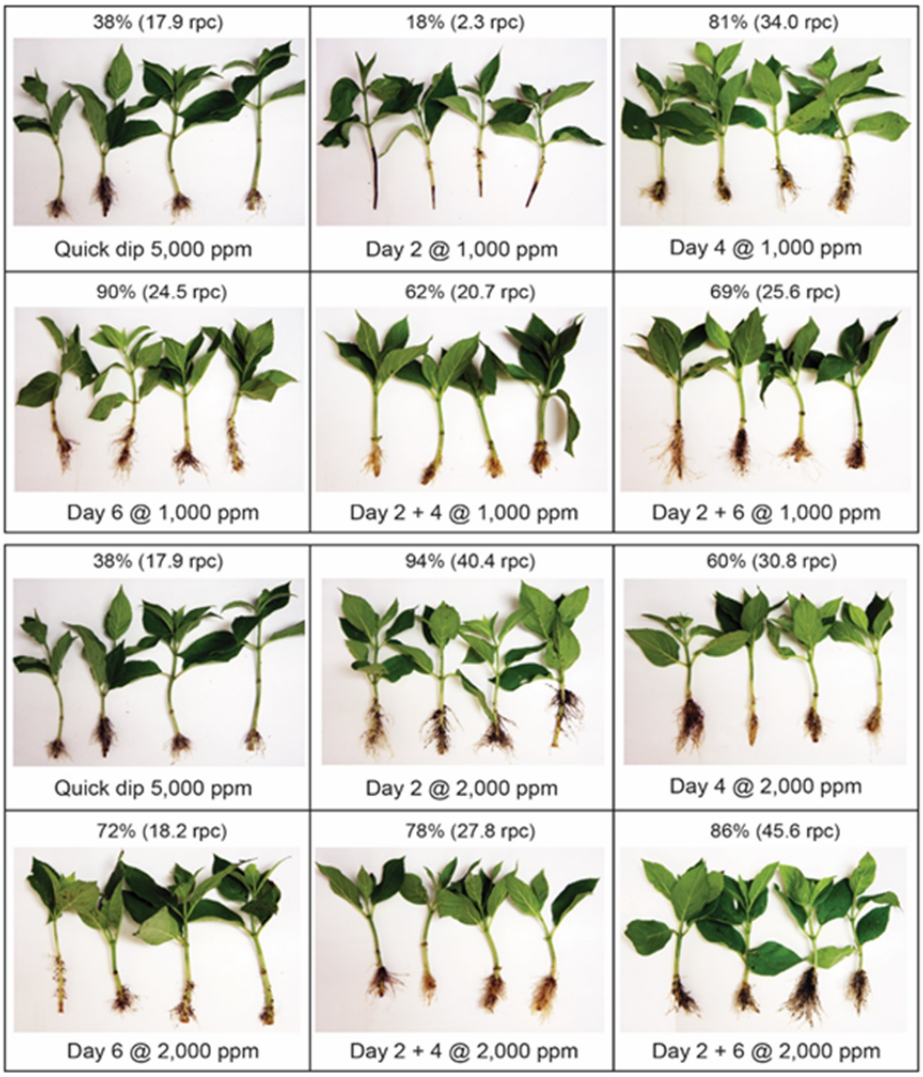

Figure 1. Rooting percentage and roots per cutting (rpc) in *Hydrangea paniculata* 'Limelight' cuttings treated with 1,000 or 2,000 ppm IBA foliar sprays at different times after sticking.

Rhus cuttings are difficult-to-root and often not responsive to auxin (Tipton, 1990). It was not unexpected to observe that *Rhus* cuttings experienced poor rooting success across all treatments (<10% rooting—data not shown). The treatments with 2,000 ppm K-IBA had marginally higher rooting success than the 1,000 ppm treatments. The quick dip treatment also had unsatisfactory rooting, even with a concentration of 5,000 ppm. However, there was no observable difference between the quick dip and spray suggesting that a foliar application could be successful with a higher auxin concentration. Additionally, cuttings with a higher leaf area may exhibit a higher response to the auxin spray (McGuire, 1967). Further trials would need to be conducted to assess this.

Literature cited

Blythe, E.K., Sibley, J.L., Tilt, K.M., and Ruter, J.M. (2003). Foliar application of auxin for rooting cuttings of ornamental crops. J. Environ. Hortic. *21*, 131–136.

Drahn, S.R. (2007). Auxin application via foliar sprays. Comb. Proc. Intl. Plant Prop. Soc. *57*, 274–277.

Kroin, J. (2009). Propagation of plants from cuttings using rooting solutions by foliar methods. Comb. Proc. Intl. Plant Prop. Soc. *59*, 437–453.

McGuire, J.J. (1967). Entrance of synthetic growth regulator IAA-2-14C into cuttings of *Ilex crenata* 'Convexa'. Comb. Proc. Intl. Plant Prop. Soc. *17*, 322–327.

McGuire, J.J., and Sorenson, D.C. (1966). Effect of terminal applications of IBA on rooting of woody ornamental plants. Comb. Proc. Intl. Plant Prop. Soc. *16*, 257–290.

Tipton, J.L. (1990). Vegetative propagation of Mexican redbud, larchleaf goldenweed, littleleaf ash, and evergreen sumac. HortScience *25*, 196–198.