

PROPAGATING PLANTS FROM CUTTINGS

Thoughts and suggestions from Carl Whitcomb PhD.

Beyond the obvious of having good water pressure, mist heads, time clocks, etc. Here are my top 10 factors that can improve the rooting and / or subsequent performance of cuttings:

1. Increased light intensity generally improves rooting, plant growth and minimizes production problems. Cell division requires energy; the more energy the more rapid root growth occurs.
2. Adding modest levels of slow-release nutrients during propagation aids rooting of some species and accelerates growth on all species. As soon as a new root is little more than a bump on the base of a cutting, it can absorb nutrients and aid plant development. Osmocote 18-6-12 at a rate of 4 to 6 pounds per cubic yard plus Micromax micronutrients at a rate of one pound per cubic yard has been the safest and most effective of the many things I have tried.
3. Direct sticking of cuttings helps improve performance and reduce transplanting stress. Bulk flats and ground beds are antiquated and should be avoided.
4. Proper care and nutrition of the Stock / Mother plant plays a big role in cutting success. In my research that led to the creation of the micronutrient fertilizer Micromax, it became clear that improved levels and proportions of the six micronutrients influenced many aspects of plant growth. Advantages of cuttings taken from parent plants grown in containers with Micromax vs. other micronutrient fertilizers or none, were dramatic. Nutrition of field grown stock plants can also influence rooting and subsequent growth.
5. Rooting of softwood cuttings, rather than semi hardwood or hardwood cuttings often improves plant performance. As mist systems and timers have improved, softwood cuttings have become the preferred method of propagation of many species. Crapemyrtle plants in September from softwood cuttings taken in late May or June typically are larger and of better quality than plants from hardwood cuttings taken in Jan, or Feb.
6. Deeper pots allow better drainage. Oxygen is a key factor in the initiation of roots on cuttings. With the technology to produce deeper pots, rooting has improved and root rot diseases have decreased. Cuttings stuck in containers four inches deep consistently outperform those in pots 2 or 3 inches deep.
7. Water chemistry affects not only rooting but subsequent growth. Years ago I became intrigued by the comments of nurserymen and their success and frustrations in rooting of cuttings. What was the difference? Why the variation? At one point, I took many cuttings from a block of dwarf burford holly plants, with each cutting as near identical to the others as possible. I divided the cuttings into four groups. I prepared the rooting medium and pots for all the cuttings so that would not be a variable. The cuttings and containers were transported to four nurseries. There were only minor differences in propagation facilities in terms of light, temperature, etc. The cuttings did root differently at the different locations. Analysis of the water used to mist the cuttings showed that as the level of bicarbonates, sodium and calcium increased percent of cuttings rooted, number of roots formed and growth of the resulting plants were all restricted.
8. Timing --- the perpetual challenge of when to take cuttings. Conditions of plant tissues change in response to many things, but especially temperature and available moisture. If the weather turns off hot and dry, the window of opportunity for taking cuttings can be shortened.

No two seasons are the same, so a calendar is only a very crude reminder as to when is the best time. Watch the plant, look for subtle differences in leaf color, stem color, leaf size, bud development on the stem, etc. Clues are generally present if you are observant enough to notice. I had the good fortune of having a good friend that was legally blind while an undergraduate student at Kansas State University. He could not see the entire shrub or tree so was forced to focus on a very limited area encompassing little more than a few leaves at a time. He taught me to look for small details, often very subtle and that I had previously overlooked. What a benefit that has been.

9. Air-root-pruning roots of cuttings has proven very beneficial. Cuttings of some species tend to form a few roots on one side of the base only. If these early roots are air-root-pruned on the sides of the container, typically more roots are formed and with better distribution around the stem. Ken Tilt at Auburn (1998) reported a 15% improvement in number of quality liners of Leyland cypress as a result of using air-root-pruning containers compared to standard pots.

10. Rooting hormones --- a mixed bag: sometimes helpful, sometimes harmful, and sometimes not needed at all. As I have improved the propagation environment and shifted to taking softer and softer cuttings, the need for and benefit from using rooting hormones has gone down. I have routinely not used rooting hormones on softwood cuttings of crapemyrtle cuttings for years. With the introduction of my five new crapemyrtle, I soon was hearing from a few licensed growers that the plants were difficult to propagate. Some clues soon came to the surface. When I did a study using Dynamite® and Tightwad Red® crapemyrtle and zero, 1,000 and 5,000 ppm of IBA, the answer was very clear. Use either level of IBA as a rooting hormone on softwood cuttings of these crapemyrtle and they root poorly if at all. Forget the rooting hormone and drop a softwood cutting on a damp floor beneath the mist bench and it too will root. Under your conditions, until you make the comparison, you will not know whether rooting hormones are helpful or harmful. We are barraged with reports of rooting hormones being helpful, but it is not necessarily so.

For more information, see *Plant Production in Containers* by Carl Whitcomb.