

Propagation of Live Oaks[®]

Charles Hudson

Grass Roots Nurseries, Inc., Leesburg, Florida 34748

INTRODUCTION

Propagation of live oaks by cuttings is a relatively new practice and can be very time consuming. Initial selections of cultivars may not yield high enough percentages to justify production. Adventitious root development may not occur at the desired rate, and sometimes not at all. Evaluations of these cultivars, starting from cutting propagation systems, can take several years.

ROOTING LIVE OAKS

- The parent or stock trees must be in good condition. Moisture and fertility are important as well as freedom from insects and disease. Juvenility also seems to be a factor in rooting percentages, as seen in cuttings taken from our customer's trees and our own stock blocks. Cutting selections are made from trees that have undergone their first elongation of the year or from shoots that have hardened from the spring flush and have developed a grayish color. The cutting season for oak trees is dependent on weather conditions and generally lasts from May through September in our area of Florida. Both early spring and late fall cuttings have proven unsuccessful.
- After branches are collected, the cuttings are prepared in the greenhouse to ensure that they never dry out. The length of the cutting is approximately 10 to 15 cm (4 to 6 inches), preferably using terminal branches. If stem cuttings are used, it is only to reduce the softer end of the cutting or to increase production numbers in the beginning stages of a new cultivar where stock plants are limited. The cuttings are stripped of their lower leaves and the stems are wounded on one or two sides by dragging the clippers along the diagonal base of the cutting. Cuttings are then put into a basket and submerged in a Zerotol solution. They are allowed to drain and then bunched together and dipped into a prepared rooting hormone solution.
- The auxins used for rooting *Quercus virginiana* are technical grade potassium salt formulations: K-IBA, K-IAA, and K-NAA. Auxins are purchased from Research Organics, Cleveland, Ohio. A stock solution of 10,000 mg-liter⁻¹ (ppm) is made for each hormone in separate bottles. Example: 16 g K-IBA to 48 oz. water; 14 g K-NAA to 48 oz. water; 14 g K-IAA to 48 oz water. Then, to get the correct ratio, all three auxins are combined and diluted once again with water into one container, i.e. 16 oz K-IBA + 12 oz K-NAA + 8 oz K-IAA + 12 oz water. A small amount of Hortasorb is also applied to final auxin concentration. The Hortasorb gives the auxin solution a consistency of honey, which will later act like a glue to help keep the hormone in contact with the exposed basal tissue of the cutting.
- The cuttings are then stuck directly into 6 × 6 cm (2 1/4 × 2 1/4 inch) square tree bands. These small single pots maximize greenhouse

space and make the grading process efficient. The air-pruning features of the cells give the best results, by supplying sufficient bottom airflow which root prunes any exposed roots and produces a more fibrous root system. Several companies produce cell packs and individual pots, which promote air pruning. Keeping trays off the ground is essential and will also help control disease and fungal problems in the mist beds.

- The tree bands are pre-filled with a propagation mix consisting of fine pine bark, perlite, coir (ground coconut hulls), and a 6-month fertilizer. A 1-yard mixture is prepared using (in cubic feet): 3 bark : 9 perlite : 2 coir (by volume), plus 6 lbs of slow-release fertilizer and water as needed to moisten the medium. The propagation medium is mixed thoroughly in a hopper for several minutes. Trays are then filled, packed, and palletized to be moved to the greenhouse. After the trays have been heavily watered and the cuttings stuck, they are immediately placed under the mist inside a clear double-poly greenhouse using the Rondo-type misting nozzle. The mist is controlled by a Davis solar controller set to run every 3 min on sunny days, and is reduced when there is overcast or rain. The frequency is reduced to turn on every 6 to 8 min after 30% to 40% of the cuttings in the tray have rooted.
- Usually within 8 to 10 weeks or after 50% rooting, the cuttings are graded. The trays are removed from the mist for a brief period of time to check each pot for visible roots. Rooted cuttings are then removed from the mist and taken to a hardening-off house with 30% shade during the summer months (to prevent shock), or placed directly under full sun during cooler months. Rooted liners are watered periodically throughout the day from a separate irrigation clock and regularly during the evening hours on a daily basis at first. Those cuttings with no visible roots are placed back under the mist. The frequency is again adjusted and the trays are fertilized weekly with a liquid fertilizer. Another grading of cuttings for rooting will occur again in 16 to 20 weeks and the same procedure will be followed. This will happen repeatedly until the remaining unrooted cuttings show no sign of root development and are discarded. This type of handling produces 60% to 70% rooting success of the overall crop. Rooted live oak liners are very sensitive to crop failure, even during and just after successful propagation. They need to be handled with care as to not disturb the root system or damage further root development.

CONCLUSION

In the past 5 to 6 years, we at Grass Roots Nurseries have tried to root many selections of *Q. virginiana* and have come to the conclusion that some selections root easier than others. Those that successfully root are the ones that are ultimately selected as new cultivars for commercial production. Concerns should also be directed towards optimum root formation during container production, as well as later root development for successful transplanting and establishment of mature trees in the landscape. The selection and rouging takes several years so that only the highest caliber live oak trees are produced.