

**CONTAINER PRODUCTION OF OAKS
A SUCCESSFUL REALITY**

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The production of Oaks in the field can pose several problems, most of which begin with the liner. For many species the problem in the past has been availability. With others it has been an insufficient root system or coarse rooted liners that fail to break uniformly if at all. Oaks are notoriously bad transplanters with frequent high losses due to slow root regeneration.

Conventional field whip production practices take up to 5 years to produce. In the first year, seeds are sown in fall or spring and harvested at 1 or 2 years of age. These seedlings are then lined out in field rows for 1 or 2 more years and then cut back to 2" in height in spring to produce a vigorous young shoot resulting in 5' to 8' whips, thus taking 3 to 5 years to produce a 1 year whip. The resulting plant generally has a coarse root system with little to no fibrous roots which at best recover slowly and in too many cases not at all. For example root regeneration in Red Oak via new root initiation occurs almost exclusively in spring and can take 40 days under standard greenhouse conditions. Consequently, field grown coarse rooted species are

difficult to transplant because they have virtually no intact root tips when harvested.¹

To meet these challenges we have adapted the 'Ohio Production System'² for the production of oaks as well as other species of shade and flowering trees, adapting the system with some changes to fit our nursery. Our primary objective was to produce a cost effective container grown liner with an improved root system that would be more vigorous when transplanted to the field.

The oaks we grow originate in 2 ways. The secondary source is from purchased 1yr seedlings preferably of known provenance of species we cannot collect ourselves. The first and most important source is the acorns we harvest or have harvested for us from known sources. This gives us the best control on the finished tree because we know something about the parent tree or at least the area from which they come. Records are kept on sources of seed or seedlings to observe how they perform. After collecting, we place the seed in a plastic bag with moth balls for 3 days to rid the acorns of any larvae. We then remove them from the bags and put them in trays of damp sand for germination. Members of the White Oak group germinate within days. Members of the Red Oak complex are chilled until January or February and

¹ Dr. Daniel K. Struve, Dr. Michael A. Arnold, Dr. Richard Beeson Jr., Dr. John M. Rutler, Dr. Sven Svenson and Dr. Willard T. Witte, The Copper Connection. American Nurseryman, February 15, 1994.

² Dr. Daniel K. Struve and Dr. Tim Rhodus, Turning Copper into Gold. American Nurseryman, Aug. 15, 1990.

then warmed sufficiently to induce germination. Germinating acorns are removed from the sand when the radical is 1/2" to 1" long and placed in the corner of 2 7/8" x 5" Anderson Bands which have an open bottom. The acorn is only lightly pressed into the media with the radical pointed downward into the corner of the pot to act as a Grow Straight for the root. The bands are placed in flats which are held above bottom heated benches by an inverted flat to air prune the tap roots. Supplemental lighting is added at night to promote additional growth.

In mid to late May the seedlings are removed from the greenhouse to a 70% shaded polyhouse for acclimatization. This is an important step to avoid shocking the plants severely. After 2 weeks the plants can be removed from the shade and transplanted to 2 gallon containers treated with Spin Out. Research at Ohio State University has shown that plants growing in copper treated pots have improved root morphology and distribution in the container. As a result, plants are able to use water and nutrients more efficiently. The media is a 60% pinebark based mix with 18-6-12 8 to 9 month Osmocote or 24-5-12 6 month Polyon fertilizer incorporated in the mix. The plants are staked and grown under overhead irrigation in our container area for the balance of the growing season. At the end of the growing season heights of oaks will vary greatly depending on

species, generally ranging from 2 to 5 feet. Container size is a limiting factor in production. When plant root systems reach the capacity before the end of the growing season the plants stop growing.

In October the trees are graded and the best seedlings preferably 30" or taller are taken to the field on wide spaced rows for caliper shade tree production 1 year after falling from the tree as an acorn. Trees that do not make grade are stored in unheated polyhouses and grown for a second season before moving to the field.

We have found that these trees will quickly reach salable size with almost perfect stands and in the same period of time with a more fibrous root system than a field grown whip at reduced cost and without the transplant losses. We have proven from a nursery viewpoint that from little acorns mighty oak trees grow.