

Bottom-Land Hardwoods for Today's Market

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Abstract-Columbia Nursery, of the Louisiana Department of Agriculture and Forestry, has been producing seedlings both pine and hardwood since 1956. We currently grow 5 - 6 million loblolly pine and 3.5 - 5.5 million hardwoods annually. The demand for hardwoods in the market today has far exceeded the research in managing and growing these species. Therefore, most nursery men and women have been left to manage on their own.

When we say bottom-land hardwood for today's market, it is very important that we first define the market. In most cases, it is bottom-lands which were once in some type of agriculture production or cut-over wetlands, being either machine or hand planted, at a minimum cost to the landowner, and not necessarily for timber production but for multiple uses. It also, in many instances, has a tendency to be inundated with water at some point in its cycle, therefore, species selection for specific sites can be critical. In the nursery setting, hardwood performance can be quite erratic between species, and each species, even though they are grown under the same general conditions, must be handled separately.

SOIL MANAGEMENT

Columbia Nursery has a silt loam soil, which is a very fertile soil with a high capacity for retaining moisture. By today's standards, most would consider this a poor nursery site. But its capacity for growing high quality hardwood and pine seedlings cannot be overlooked. Working in this soil type, like another site, is not difficult if you maintain a high organic matter content, have good internal drainage, and good overall field drainage.

Organic matter is currently maintained between two and three percent through the use of cover crops of corn, winter wheat, sudex., and outside sources. Outside sources include: gin trash, bedding material from a local horse farm, chips from the town of Columbia, Louisiana, and sawdust from local mills. pH is maintained at about 5.6, and soil samples are taken annually and adjusted as needed.

Hardwood seedlings are rotated one year in cover crop and one year in seedlings. With the high demand for bottom-land hardwood, however, about one-third of the crop is planted two years in seedlings and one year in cover crops. Without the addition of organic matter from outside sources, it would be impossible to maintain good soil quality. Cover crops of sudex are planted in the spring, and cut down before heading. Following this, two inches or more of gin trash is spread over the entire area. The sudex is then allowed to grow four feet in height, then cut down and disc under.

The cover crops of sudex and gin trash are cut-under around the end of July to insure good decomposition before fall fumigation. Outside sources of organic matter are always followed by fall fumigation to control any introduced weed seed. Fumigation is performed each year over about two thirds of our hardwood ground with about a third of the crop being grown on ground two years out of fumigation. On the second year ground, we try to plant species which

germinate readily and exhibit fast initial growth to help with weed control. These species include, but are not necessarily limited to, Nuttall oak, overcup oak, Shumard oak, and baldcypress.

PLANTING

One very important thing to consider in preparation for planting is planning species location in the nursery. Many species exhibit extremely fast growth in the nursery environment, while many species tend to have slower initial growth patterns. These slower species will need a little extra push during the growing season. Species such as green ash, Nuttall oak, and baldcypress, which tend to have faster growth patterns, do not need to be planted next to species such as water oak and sweet pecan, which tend to exhibit slower patterns of growth.

Fall planting is done as much as possible, but for the most part, planting begins around the first of March and continues until the middle of May. Timing planting can help control the uniformity of the crop. If they can't be fall planted, slower germinating species, such as water and willow oak, should be planted first; the faster species, such as green ash and cypress, should be planted last. After planting, be sure to maintain adequate moisture to insure uniform germination. Most bottom-land species are planted four drills to a bed for six seedlings per square foot. By planting four drills this allows for the easy use of a drill sprayer for weed control during the critical time before the seedlings close. Most seed is planted one to two inches deep and a soil stabilizer mixed with pre-emerge herbicide and fungicide is applied in one pass immediately following planting. With fall planting, rye grass instead of soil stabilizer is broadcast over the beds after planting. In February before germination the rye grass is killed. In some cases the seedlings may have already begun to germinate, and on these we simply use Fusilade or Poast.

THE GROWING SEASON

Following germination, after the seedlings have reached about ten inches, a shielded sprayer can be used to eliminate any emerging weeds. This sprayer, along with one or two men goose picking, can keep the entire crop practically weed-free. A good weed control program with a zero tolerance for weeds is essential in maintaining a clean nursery.

A flush of growth can be stimulated at practically any time during the growing season. This is done by applying 15-20 units of nitrogen per acre and watering thoroughly. By the same token, seedlings may be held back by withholding water and nutrients. Care must be taken to maintain enough soil moisture to sustain a healthy seedling.

Though uniformity in hardwood is not quite as critical as pine, it does make for easier packing and shipping. There are a number of ways to work towards a fairly uniform stand of hardwoods. Top pruning, fertilization, and undercutting to name a few. Before any method is used, parameters for seedlings sizes must first be established. With bottom-land hardwoods we like a 16" - 30" seedling. If planted at the proper density, seedling caliper in hardwood should not present a problem with a 16" seedling. There are many times seedling heights and calipers must be adjusted for specific conditions and individual cooperators: therefore. it is

important to understand the growth characteristics for individual species and plan their management accordingly.

Top pruning begins when the seedlings reach 18"-20" in height. At this point, the seedlings are pruned back to 12"- 14". This will help release some slower germinating seedlings that have been suppressed, and can also help increase the caliper of seedlings that may have a higher density than anticipated. The second top pruning is done when seedlings reach about 24"-26", and these are pruned back to 18"-20". This second pruning is usually around the first of August. This is about as late as we like to prune hardwood.

Undercutting the seedlings can be used to control seedlings size and stimulate a more fibrous root system with more first order laterals if needed. Undercutting before seedlings reach target heights is not recommended. It is also important to make sure root rot problems, if present in an area, are not spread into other areas of the nursery. Undercutting can be very beneficial, if needed and done properly. It can also be very detrimental if not done properly.

In many instances, certain areas of the nursery, or even within each bed may show different patterns of growth. By fertilizing during the growing season, either with a gandy, for granular, or a spray rig for liquid fertilize, specific problems areas can be treated individually, regardless of how small.

There will always be conflicting circumstances between species and market conditions which must be addressed and each must be handled separately. An open line of communication between the cooperator and the nursery must be maintained. Many times site conditions, planting methods, and time of planting must be considered when regulating seedling size. It is because of these many varied conditions that one specific target seedling in hardwood cannot and should not be maintained.

CONCLUSION

With hardwoods it is important to understand that what works for one species may not necessarily work for another. Sometimes it is best to let nature take its course and watch and try to learn. We as nursery people can only manipulate the environment to a certain degree without having adverse effects on the seedlings. In many instances today there is a tendency to over exaggerate the role we play in growing what we call a target seedling. For the most part nature plays a much more important role. In many cases a hands-off approach in growing seedlings is the best approach. In other words, provide a good clean bed, enough food, enough water, and watch them grow.

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