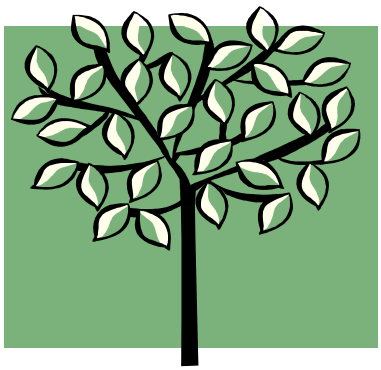
VOLUME 3, ISSUE 1 WINTER ISSUE—JANUARY 2008

The Stand Manager

Technical Development, Planning and Utilization Unit Newsletter
NC Division of Forest Resources—DENR



Tech Updates

Ron Myers

A New Year brings new updates, new training, and new understanding. North Carolina Division of Forest Resources is having to adapt to a new system of how some Federal grant money is distributed to State Forestry Agencies within State and Private Forestry. This new competitive grant process may provide for some interesting projects and new partnerships in the future. In this issue we examine the benefits from early planting of containerized longleaf pine. We challenge you to think outside your normal window for tree planting.

This issue we feature forestry management work by a consulting forester in the Piedmont region. It's great to report that some foresters do more than just clearcut and plant loblolly pine. We also provide an introduction about Woody Biomass. You will likely see more attention given to these emerging concepts of biomass for energy, carbon credits and sequestration, group certification opportunities, and forest sustainability issues. Now available to NC DFR field personnel are the Invasive Plant Pocket Guide and the Best Management Practices Quick-Reference Field Guide that was produced by our NPS Unit.

Upcoming NC DFR Longleaf Pine Workshop—February 12-13th, 2008

O.P. Owens Agricultural Center in Lumberton, North Carolina

Inside this issue:

Hdwd Silviculture

Ron Myers

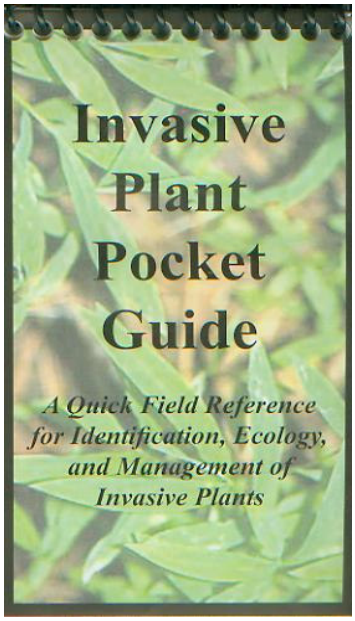
New Field Pocket Guide for Non-Native Invasive (NNI) Plants

A quick field reference for the identification, ecology, and management of invasive plants is now available. This publication was made possible by a cooperative grant between the NC DFR, NCSU Extension Forestry, and USFS R8 Cooperative Forest Health Program.

It contains approximately 24 NNI species that have the potential to negatively impact our NC forests. The species featured in this pocket guide contain invasive trees, shrubs, vines, herbs, and grasses. It contains brief information on the identification, ecology, and plant control. These guides were printed on a moisture and tear resistant synthetic paper for use in the field. They will fit easily into your FM vest pocket for a quick field reference.

This past July 9-10, a workshop on invasive plant ecology and management was held at NCSU in Raleigh, NC. Several NC DFR personnel attended the 2 day workshop that included classroom instruction, field exercises, case studies, and specimen identification.

Additional copies of the NNI pocket guide can be obtained by contacting myself or Kelley McCarter, FEOP Program Coordinator at NCSU (919-551-9563).



Conifer Silviculture

Bill Pickens

The Effects of Early Planting Dates on the Survival and Growth of Containerized Longleaf Pine Seedlings

Containerized seedlings are the preferred stock type for reforestation of longleaf pine because of the better survival results compared to bare-root longleaf seedlings. Research has shown that use of containerized seedling can increase average survival by 22 % and decrease the time for seedlings to initiate height growth. The protection afforded by the plug reduces damage to the fine root hairs during lifting, storage, and planting. The moist plug also helps reduce transplant shock especially on adverse sites.

Container seedlings can be planted year-round, but are typically planted from November through March when adequate soil moisture is more likely. Some foresters suggest that longleaf seedlings planted in the fall will perform better due to root growth during the fall. Nursery managers encourage early planting to reduce mortality from winter freezing and to expand the seedling lifting window.

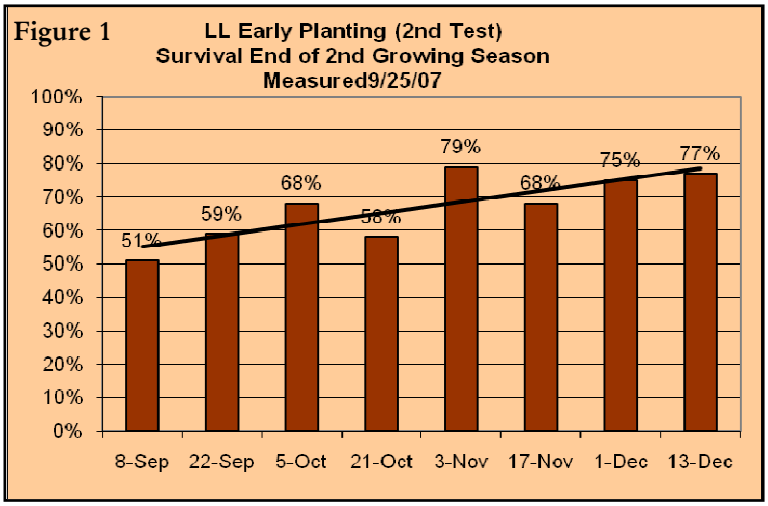
In 2005, NC DFR began a study to examine the effects of fall planting on the growth and survival of longleaf pine seedlings. The study objectives are to examine the benefits of early planting on the growth of longleaf containerized seedlings. The hypothesis is that early planting improves survival and first year root growth so that the seedlings initiate height growth sooner.

Methods

The study site is located at Bladen Lakes State Forest on Keenan fine sand soil. Specific planting dates are shown in table 1, but generally seedlings were planted every 2 weeks beginning the first week in September until mid December for a total of eight planting dates.

Containerized seedlings were lifted the day of planting from the NC Division of Forest Resources Claridge Nursery. A total of 120 trees were planted on each planting date in a randomized 20 tree row plot design replicated 6 times. Survival was tallied after the first year and survival & height measured after the 2nd yr.

Figure 1 LL Early Planting (2nd Test) Survival End of 2nd Growing Season Measured9/25/07



Results

Two years after planting significant survival differences among the planting dates were tallied. Survival after 2 years ranged from **51 percent to 79 percent.** The worst survival occurred for the September 8 planting date (Figure 1). The best survival occurred on the November 3rd planting date. Although it is numerically higher, it is not statistically different from the November 17, October 5, December 1, or December 13 dates. **The general trend is for survival to increase from early to late fall (Figure 1).**

Average height after two years ranged from 0.68 feet to 1.10 feet. **The best height growth occurred on the trees planted from mid September through early November.** The worst growth occurred in trees planted early in September or December.

The general trend shows decrease in overall height from September through December (Figure 2). This may be due to decreasing soil temperatures that may inhibit seedlings putting on height growth.

The percent of seedlings initiating height growth after 2 years showed the same decreasing trend. More seedlings remained in the grass stage for the Dec. plantings verses a lower percentage still in the grass stage from earlier planting dates by age 2 (Figure 3).

Figure 2 LL Early Planting Height End of 2nd Growing Season

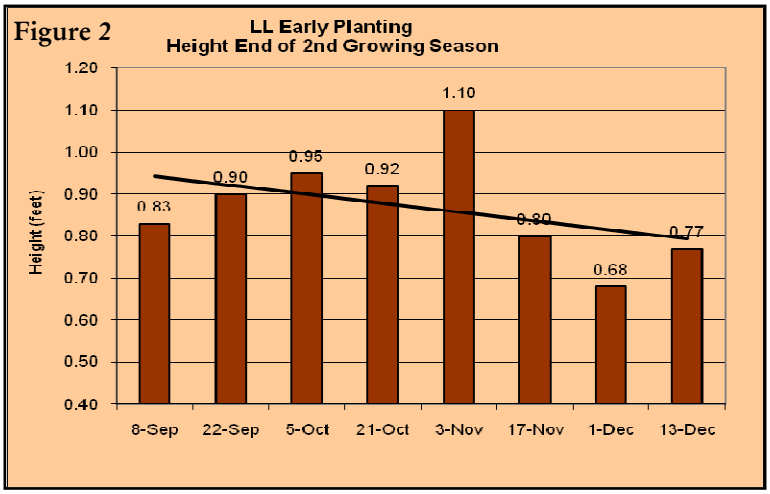


Table 1: Longleaf Pine Percent Survival, Mean Height (Feet), and Percent Ht. Growth Initiation by Planting Date.

Planting Dates	Percent Survival	Height (Feet)	% Ht. Growth Initiation
Sept. 8	51% a	0.83 ab	78%
Sept. 22	59% ab	0.90 bc	84%
Oct. 5	68% bc	0.95 bc	82%
Oct 21	58% ab	0.92 bc	83%
Nov. 3	79% c	1.10 c	80%
Nov. 17	68% bc	0.80 ab	77%
Dec. 1	75% c	0.68 a	62%
Dec. 13	77% c	0.77 ab	69%

**Means followed by the same letter are not significantly different at P=.01 level

Conclusions

The results from this study support findings from previous studies that reported increased early growth and similar survival rates for seedlings planted in the fall compared to those planted in the winter.

The poor survival rates in September are likely due to lower soil moisture found on droughty soils and the higher evaporation and transpiration rates during that time of year. The study reported good survival rates when planting container longleaf seedlings in October, November, or December for this soil type.

Photo 1 and 2 on left show the differences in root growth for treatment 3—Oct. 5th planting date vs. treatment 7—Dec. 1st planting date. Seedlings were dug up in February.

As expected the seedlings planted in October and early November had the best height growth and lowest number of seedlings remaining in the grass stage two years after planting (Table 1).

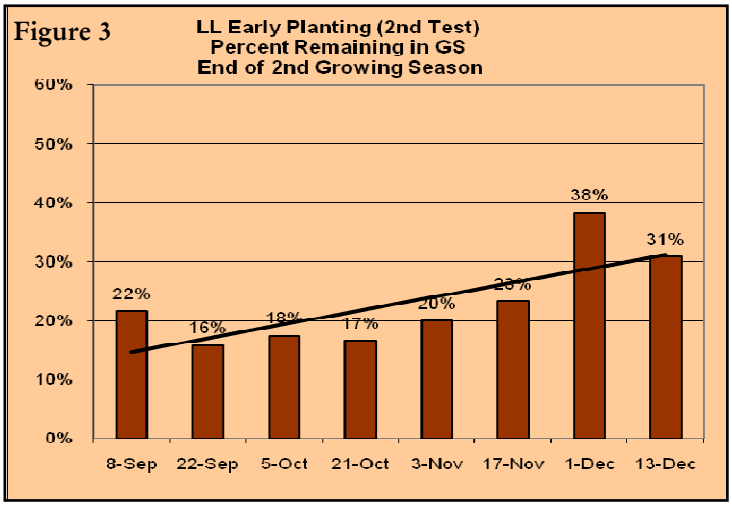
The number of seedlings still in the grass stage increased significantly for seedlings planted in mid November and both December plantings. This seems to be the result of less root growth in the winter because of lower soil temperatures.

The study results support the recommendation to plant containerized seedlings in the fall months. Good survival can be expected with fall planting. Better height growth and height growth initiation is expected for seedlings planted in October and November.

The potential for lower survival rate, particularly on adverse sites, is offset by earlier height growth initiation and height growth. Increased survival is likely on better sites if good site preparation is done to control herbaceous weed competition. Seedlings planted in the winter months remain in the grass stage longer and may die from vegetative competition.

Tree planting season does not always have to be between Dec.—March for best results. For improved containerized longleaf pine results, consider earlier planting dates.

Figure 3



Forest Utilization and Resource Data

Mike Mann

What is Woody Biomass—An Introduction

Biomass in its simplest form is defined as organic matter renewable over time. Woody biomass is the accumulated mass, above and below ground, of the roots, wood, bark, and leaves of living and dead trees and shrubs. Woody biomass can be used for generating electricity, producing biofuels, and making biochemical's such as adhesives, solvents, plastics, inks and lubricants. By creating more renewable natural energy alternatives, the U.S. can reduce its dependence on nonrenewable energy feedstocks, reduce wildfire risk, offset green house gas emissions, mitigate declining pulpwood markets, enhance rural economics and improve forest health and sustainability by simply increasing the utilization of forest biomass.

Principal sources for woody biomass in the southern U.S. include harvest residues; mill residues; small diameter trees; cull trees; trees damaged by wildfire, insects and disease and short rotation wood crops. Biomass volumes associated with these types of sources can be very significant.

Sources and Quantities of Woody Biomass in the South

Logging Residues and Thinnings – Branches, tops, stumps and other wood debris from commercial harvesting operations in the South are routinely left behind at the harvest site. Nationally, about 40 million dry tons of collectable logging residues are left unused annually. Of these logging residues, about half are located in the South. In addition, small diameter trees from thinning operations have traditionally been used in the pulpwood supply chain, but declining markets have limited this practice. As a result, these trees are not harvested and excess trees are not thinned from the forest stand.

Fuel Treatment Thinning – Fuel treatment thinnings can provide large volumes of woody biomass. Increasing threats of forest fires have brought attention to the hazardous fuel buildup in the forest and opportunities to reduce this risk. According to a recent study, about 8.4 billion dry tons of biomass have been identified nationally for treatment, yet due to accessibility, recovery limits, and the merchandizing of some timber for higher value products, only 60 million dry tons of fuel treatment thinning can be removed annually. This material would come from both private and public forests with some 60 percent of the material from private lands.

The Craven County Wood Energy Biomass plant, located near New Bern, NC, is a 50 megawatt wood waste-fueled power plant. It consumes approximately 530,000 tons of wood waste each year.

Source: http://www.cmsenergy.com

Using the same Forest Inventory Analysis data and the same calculation tool, about 2.7 billion tons are available in the South. Proportionally, this means that a total of about 20 million tons are available for removal. About 85 percent of this material would come from private lands in the South.

Debris from Natural Disasters – Woody biomass can also be salvaged from trees damaged by natural disasters. The most common natural disasters in the southern U.S. are wildfires, insect and disease outbreaks, and hurricanes. Southern pine beetle killed timber alone can provide on average, 1.36 million dry tons of biomass. In 2005, more than 800 million dry tons of wood were destroyed by hurricanes. While the quantities of woody biomass created by natural disasters can be quite large, this supply is not stable and varies tremendously over time and space.

Mill Waste – Residues from the forest products manufacturing process are commonly used to create energy for the forest products industry. These residues come from primary and secondary wood processing mills and pulp and paper mills. This type of biomass is highly desirable because it is clean, concentrated, uniform, and low in moisture. About 97 percent of this resource is currently used.

Short Rotation Woody Crops – Short rotation woody crops, grown specifically for the production of energy, are fast growing species that can be planted at relatively lower costs and harvested in less time than traditional species. This source of biomass is not expected to become significant in the South until 2040, due to investments in southern softwood production and the relative availability of smaller trees.

Woody Biomass Continued……

For more information on woody biomass refer to the Encyclopedia of Southern Bioenergy

http://www.forestencyclopedia.com/encyclopedia/bioenergy) or Forest Bioenergy (http://www.forestbioenergy.net/).

Source: Foster, C.D.; J. Gan; C. Mayfield. 2007. What is Woody Biomass? Pages 27-30.

In: Hubbard, W.; L. Biles; C Mayfield; S. Ashton (Eds). 2007 Sustainable Forestry for Bioenergy and Bio-based Products: Trainers Curriculum Notebook. Athens, GA; Southern Forest Research Partnership, Inc.

NC DFR Once Again Hosts 2007 International Foresters Tour

Barry New

On October 15th-16th, North Carolina Division of Forest Resources along with NC State University Department of Forestry & Environmental Resources hosted **19 foresters** from around the world as part of the **23rd Annual International Symposium on Forest Administration & Management**, coordinated by Northern Arizona University School of Forestry.

The North Carolina segment of the 3-week program included a tour of Stewardship landowner Preston Floyd's property in Vance County. A visit to several research sites and an active logging job on the Hill Forest with **Joe Cox**, and a reforestation project in Durham County with forestry consultant **Bill Dryman**. Participants also received an introduction to forestry in North Carolina with presentations by **Dr. Barry Goldfarb, Rick Hamilton, Bob Slocum, Wib Owen and Kelley McCarter**. Our extensive private ownership of forestland, and the associated rights and responsibilities, particularly intrigued the visitors.

Representative countries included: Indonesia, Gabon, Cambodia, Israel, Jamaica, Guatemala, Sierra Leone, Senegal, Liberia, Jamaica, Ghana, Thailand, Honduras, Republic of Guinea, Madagascar, Sudan, Morocco, and the USA.

Upland Hardwood Silviculture Workshop held by NC DFR

Barry New

On November 6-7th, 2007 about **40 NC DFR field personnel** from both Regions 2 & 3 attended a 2 day workshop on **Upland Hardwood Silviculture** in Crossnore, NC. Region 3 Regional Forester **Greg Yates** together with the TDP Unit pulled together well known speakers along with field sessions and a mill tour to learn about hardwood management.

Dr. Mark Megalos presented an overview and history on hardwood management in NC while **Dr. Henry McNab** focused on evaluating and recognizing soil and site conditions necessary for successful hardwood management. Consulting forester **Jeff Pardue** with **Forestland Consultants Inc.,** presented a consultant forester's perspective on the current hardwood market situation while **Harry Watt** a business improvement specialist provided information on market opportunities for under-utilized hardwood species.

The highlight of the workshop was a presentation by **Dr. Jeff Stringer** an extension forester with the University of Kentucky on "Evaluating degraded hardwood stands and How to build merchantability back into degraded stands with acceptable growing stock". More technical information can be found in the Hardwood Silviculture Notes series **http://www.utextension.utk.edu/publications/forestry**

Field Notes: Special Projects & FM Activities submitted by County personnel or Foresters

Forestry Consultant Practices Hardwood Management

David Halley

David Halley, a consulting forester with **True North Forest Management Services** is overseeing a large hardwood management project for the **Old North State Boy Scout Council at their 1,600 acre Cherokee Scout Reservation in Caswell County.** Dave is implementing a large-scale hardwood management program with long-term goals to create, manage, and restore high quality hardwood stands.

He is accomplishing this through several different hardwood silvicultural practices. Dave is using a combination of **Improvement Cuts, Shelterwood Cuts and Group Selection harvests** to promote growth, improve stand structure, cultivate advanced regeneration and regulate species composition. Much of the initial treatments were marked for Improvement Cut harvests where the consulting forester marked individual trees for removal. On these Improvement Cuts, the initial harvest was to commercially **remove about 15 to 20 percent of the basal area from the stand with a goal of maintaining about 70 square feet of basal area.** The other advantage of an Improvement Cut is that it allows enough filtered light to penetrate to the understory to help improve advanced regeneration of preferred species such as oak.

Much of the current understory of these predominantly oak-hickory forests at the Boy Scout Camp were lacking in advanced regeneration of oak. Prior to implementing a final harvest, the goal is to cultivate the advance regeneration of oaks in these thinned stands. Dave recognized that "*If we were to clearcut these existing stands we would not have gotten the same species mixture. Without an adequate amount of advanced oak regeneration in the understory there would have been little chance of getting an oak dominated forest back.*" We like to see the advance regeneration of oak get up to at least 3 to 5 feet in height before we consider removing the overstory in a regeneration harvest, such as a group selection opening. David feels that "*advance oak regeneration of this size has a reasonable chance of growing in height as fast as competing species after a regeneration harvest. Oak seedlings smaller than this tend to struggle early on and do not have the capability to grow in height rapidly enough to compete or have any chance of being part of the next forest.*"

True North Forest Management Services is also utilizing small **Group Selection harvests** at the camp. Because oak, shortleaf pine and yellow poplar are the most commercially valuable trees at the camp, True North is favoring openings at least one acre in size but no larger than 3 acres in size. The Camp really likes the visual aspects of these smaller sized openings because they look more natural than a large clearcut, and it maintains the aesthetic qualities of the forest. The group system also produces excellent wildlife habitat, with a proposed **80-year rotation** for hardwoods and an eight year cutting cycle that equates to 10 cutting cycles per rotation. With close to 600 acres of upland hardwood forests on the camp, True North is planning to create twenty to thirty group openings on about 60 acres every eight years. True North is also in the process of converting about 130 acres of Virginia pine stands to loblolly pine and native Shortleaf pine. The forestry consultant is utilizing funds from both the Forest Development Program and the Forest Landbird Legacy Program to help keep reforestation costs low.

If you are interested in discussing the forest management work being done or would like to schedule a visit , contact David Halley by e-mail at halleydave@aol.com or by phone at 919-552-4109. **Website: www.truenorthforestry.biz**