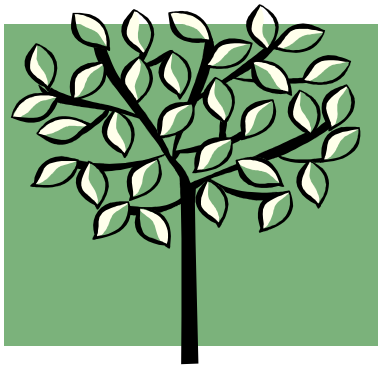
VOLUME 2, ISSUE 1 WINTER/SPRING ISSUE—MARCH 2007

The Stand Manager

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



Tech Updates

Ron Myers

I hope you will find the Winter/Spring Edition packed with helpful information to assist you with your technical field work and information that you can provide to forest landowners. Part of the reason to change the format of our past newsletter was to update you on the many cooperative projects that the NC Division of Forest Resources participates in and to provide new information to our field units. I feel that the NC Division is making positive changes in our forest management philosophy and future direction on the type of resource management and stewardship that we promote going into the future.

The PRS system will allow NC forest landowners to know the genetic potential of their new forests that they plant using NC DFR trees. Longleaf restoration has great promise in our state, not only as a tree but as a functioning ecosystem with native plants, prescribed burning, and wildlife management. NC DFR Longleaf Pine Initiative outlines how we as managers can do more to promote increased restoration & management of Longleaf pine. The NC Division has been an active member of the NCSU Tree Improvement Cooperative since 1963. Now we have taken our pine management a step further by joining the Forest Nutrition Cooperative (FNC) as a corresponding member. This should add enhanced benefits and information to our field units regarding educating forest landowners who want to intensively manage their pine plantings for increased timber potential.

Inside this issue:

Tech Updates	1
Longleaf Pine Establishment	1-2
NonNative Invasive Species	3
Nursery PRS Review	4-5
Field Notes	6
Forest Nutrition Coop. News	7

Pine Silviculture

Establishing Longleaf Pine in Agricultural Fields

Bill Pickens

The USDA's Farm Service Agency (FSA) is currently promoting their Conservation Reserve Program (CRP) Longleaf Pine Initiative (CP36) designed to afforest up to 32,250 acres of longleaf pine forests in 42 North Carolina counties. This practice is to restore and manage Longleaf Pine forest on cropland or agricultural fields that have been previously farmed. This program also will require mid-contract management that includes understory burning, or light disking between the tree rows. These mid-contract practices were designed to help promote management for improved wildlife habitat.

According to the FSA technical requirements, The Following Steps Are Often Necessary to Establish Longleaf Pine in Agricultural Fields
(*Site specific actions, as applicable, should be outlined in the conservation plan)*

- Control all Tall fescue, Bermudagrass, Bahiagrass, or other non-native plants using "non soil active" herbicide.
- Leave field un-cropped (fallow) for 12-months before planting Longleaf to aid establishment.
- Lightly scalp tree planting rows to depth ≤ 3-5".
- Sub-soil tree planting rows to relieve compacted layer.
- Band spray soil active herbicide to control competition in rows during trees 1st year.

Plant **400 to 500** Longleaf seedlings at a uniform spacing indicated below:

Tree Spacing	8 ft.	9 ft.	10 ft.	11 ft.	12 ft.
8 ft.	-	-	-	495	453
9 ft.	-	-	484	440	403
10 ft.	-	484	435	-	-
11 ft.	495	440	-	-	-
12 ft.	453	403	-	-	-

- Establish firebreak (without trees) at least 15 ft. wide surrounding stand, or separating stands.
- Band spray soil active herbicide to control competition in rows during trees 2nd year.

This CRP tree-planting program will spark an interest in planting longleaf pine. Agricultural fields and pastures are the most difficult sites to establish longleaf pine seedlings. More intensive practices are necessary on these challenging sites. Landowners must consider some or all of the following practices to increase the likelihood of success when establishing longleaf pine on pastures and former agriculture fields.

- Intensive site preparation is a must and should include both a broadcast herbicide application and mechanical scalping. Scalp 2-3 months ahead of planting to allow the soil to settle.
- Do not scalp poorly drained or heavy textured soils (high clay content) as the furrow may hold water. Bedding may be a more practical alternative.
- Subsoil clay soils to break up any hardpans and to allow easier root establishment. Rip when the soil is dry several months prior to planting (to allow soil to settle in).
- Plant longleaf seedlings correctly. It is better to err upwards than to plant a seedling too deep. Never cover the seedlings terminal bud with soil by planting too deep. Erosion may wash soil over seedlings in scalped rows. If erosion is likely, either plant the seedling off to the side of the furrow or plant containerized seedling a half to one inch shallow.
- Test the pH of the soil. Pines grow best when the soil pH is 5.0 - 5.5
- Do not spray **OUST™** overtop of seedlings if the pH is greater than 6.5. If the pH is 6.0 or more cut the rate to 1 ounce per acre. High pH increases the efficacy of **OUST™**
- Do not apply any herbicide overtop of longleaf seedlings unless new root growth is evident. Dig up a few seedlings and check for 2-4 inches of new root growth prior to applying any herbicide. Lack of new roots is an indicator of low vigor.
- Control herbaceous competition is difficult on high quality sites. Multiple release treatments are often required to adequately control the profuse vegetation that is likely.
- Consider letting the field lay fallow for one year to allow better evaluation and control of the weed competition certain to establish.
- Plant in the fall so that the seedling establishes a vigorous root system that will better survive weather extremes and herbaceous competition next spring.

Figure 1: Longleaf Pine Machine Planted in Onslow County by NC DFR Forestation East

NC DFR Forestry Leaflet FM-39 contains more Tips on Successfully Establishing Longleaf Pine

Hdwd. Silviculture

NC DFR Conducts Non-Native Invasive (NNI) Species Work

Ron Myers

According to the US Forest Service National Strategy for NNI Management the accelerated spread of terrestrial and aquatic species is one of the greatest natural resource concerns in the United States and cost the US over $137 billion each year. Invasive plants are spreading at an estimated rate of 1.7 million acres per year across forests and grasslands, while invasive insects and diseases continue to plague millions of acres of private, State, and National forests nationwide.

The goal of the **Forest Health Protection—Region 8** NNI species management program in the South is to reduce, minimize, or eliminate the potential for introduction, establishment, and spread of non-native invasive plant species across all forested landscapes and non federal ownerships in the Region. Important component areas for this strategy include the following:

- Prevention
- Early Detection and Rapid Response
- Control and Management
- Restoration
- Partnerships and Cooperation
- Research
- Information and Education

The Fiscal Year 2004 Budget for the USFS Invasive Species Management Program was $94 million dollars. Currently there are NNI Grant Funds available from the USFS–Region 8 FHP that NC DFR have been applying for. The NC DFR Grant Allocation has averaged **$50,000/year for the past 2 years.**

Figure 2: Hack-n-Squirt Treatment on Ailanthus stems to Free-up Yellow Poplar Crop Trees at Rendezvous Mountain ESF.

Since FY2003, NC Division of Forest Resources NNI Grant Projects has totaled more than $205,0000 in grant funding. The majority of this grant funding has been allocated to Educational State Forests in NC for Non-Native Invasive Species Work. In FY04 NNI species control work was performed at **Rendezvous Mountain ESF** included treating 11acres of *Ailanthus altissima* (Tree of Heaven) in a 15 year old Yellow Poplar stand shown in Figure 2.

In FY05-06 NNI species control work was performed on 103 acres at **Mountain Island Educational State Forest**. Grant funds were used to purchase a pre-owned Franklin C7F skidder that was retrofitted with a speed-sensing unit that utilizes a GPS sensor. This agricultural control unit helps to regulate herbicide flow for more precise and efficient application rates. The NNI species targeted for control and eradication included Kudzu, Tree of Heaven, Autumn Olive, and Wisteria. About 15 acres of Kudzu and Wisteria were treated in open fields or cleared openings following stand disturbances. Tordon 101 was used for treating the Wisteria while an Accord/Oust mixture was used for treating the Kudzu. Tree of Heaven and Autumn Olive were treated using Arsenal AC and much of the control measures were in-stand treatment under pines that have been thinned or prescribed burned.

NC DFR and NCSU Forestry & Outreach Program has a cooperative project this year to sponsor a NNI Workshop and develop a pocket field reference guide for the most significant NNI plants affecting our NC forests. This cooperative work is part of a **$20,000 grant** awarded to NC DFR for "Non-Native Species Outreach to NIPF Landowners in NC using Literature and Training Sessions. The workshop is planned for July 9th-10th at the J.C. Raulston Arboretum in Raleigh.

Invasive Plants of Eastern US Identification and Control—**www.invasive.org**

Source for Information and Images of Invasive species—**www.bugwood.org**

Fact Sheets on Alien Plant Invaders of Natural Areas –**www.nps.gov/plants/alien**

Nursery/Tree Improvement News: Updates, Activities, and Breeding Work

Performance Rating System (PRS) makes its Debut for Genetically Improved Loblolly Pine

By Ken Roeder and Greg Pate

The North Carolina State University-Industry Cooperative Tree Improvement Program (NCSU-ICTIP) has released a rating system that allows the public to compare the potential genetic improvement of loblolly pine (*Pinus taeda*) seedlings available from its members. This **Loblolly Pine Performance Rating System** (***PRS***) was developed using data compiled over **50** years of genetic research. The improved loblolly pine selections described in this database are available for deployment by any member of the Cooperative.

PRS ratings are available from the nurseries of Cooperative members who are producing improved loblolly pine seedlings for deployment in North Carolina and other states. Buyers of these seedlings will be able to obtain Specification Sheets from the seedling seller showing the genetic rating of seedlings available for sale and deployment. This consumer friendly information will allow buyers of genetically improved seedlings a means to evaluate the tested genetic potential of seedlings available from members' nurseries. The values presented in the rating are to be used for comparison purposes only and do not indicate an absolute performance level of a selection on any particular site or under any silvicultural practices.

Loblolly Pine PRS™ Spec Sheet

Test Version 2006.1

Family Code: **16C012181** Deployment Region: **Coastal NC**

PRS™ Ratings

Productivity Rating **34**

Rust Resistance Grade **A**

Stem Form Grade **C**

The PRS™ Ratings indicate that compared to the local unimproved loblolly pine checklot for the NC Coastal Plain, family **16C012181** is projected to be:

P = **34** → Approximately 34% more productive (have greater stem volume) at age 6 years

R = **A** → Excellent for resistance to fusiform rust disease

S = **C** → Average for stem straightness

Family **16C012181** has been tested by members of the NC State University – Industry Cooperative Tree Improvement Program and is adapted to grow in the North Carolina Coastal Plain Deployment Region* (circled on the map).

* The Deployment Region is based upon adaptability guidelines developed by the USDA Forest Service (see Schmidtling 2001, ***Southern Pine Seed Sources***, available at: http://www.srs.fs.usda.gov/pubs/gtr/gtr_srs044.pdf

The gray shaded area on the map indicates the natural range of loblolly pine.

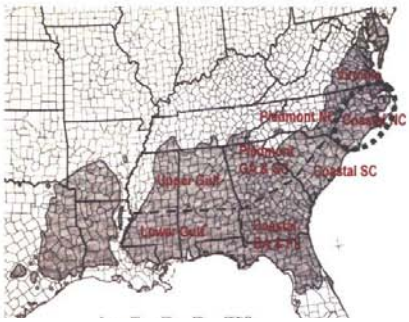


Figure 2: Greg Pate looking at Machine Planted Loblolly pine in Pamlico County.

The PRS rating consists of 4 components:

(1) Deployment Region the selection was tested for

(2) Productivity of that selection in that Deployment Region

(3) Rust resistance rating of the selection

(4) Stem Straightness rating of the selection

Productivity, Rust and Stem straightness are rated against a wild commercial seedlot from that Deployment Region which was used in the field testing conducted by the Tree Improvement Cooperative and its membership.

There are two Deployment Regions designated for North Carolina. They include the Coastal NC Region and Piedmont NC.

The Productivity rating provides an estimate of the percent of potential genetic gain in volume of a particular selection. Having the productivity estimate in volume is important to landowners because timber buyers purchase wood on the basis of weight. Forest managers can also look to the per acre volume estimates on Site Index tables.

The Rust rating uses an alphabetic code comparing estimated stand rust infection rate to the commercial check seedlots. "A" is better than "B" is better than "E". An unimproved loblolly pine stand would have a rust infection rate of 50%. If a loblolly pine family has a lower rust level, then it would be good. If it has a higher rating, it is very susceptible to rust. For many selections in North Carolina, there was not sufficient rust infection in trials to evaluate resistance. This is partially due to rust being less virulent here that in other parts of loblolly's range. In the Coastal NC data, about 45% of the selections are listed as "X" – "Not Tested". In the Piedmont NC selections, 67% have an "X" – "Not Tested" rating.

The Stem Straightness rating also uses an alphabetic code based on percent expected improvement over the commercial check seedlot. The commercial check seedlot is therefore rated at 0%.

Table 1: PRS Rating Summary for Rust and Stem Straightness

				Percent of Improved Population in listed Deployment Region			
				Coastal NC		**Piedmont NC**	
PRS Rating	Approximate Rust Infection Rate* (%)	Approximate Stem Straightness Improvement** (%)	Approximate Portion of Entire Improved Loblolly Pine Population in each ***PRS*** Rating Category (%)	Rust (%)	Stem Straightness (%)	Rust (%)	Stem Straightness (%)
A	< 15	> 30	10%	5	10	5	7
B	15 – 30	20 – 30	20%	10	13	12	19
C	30 – 50	10 – 20	40%	21	34	30	37
D	50 – 65	5 – 10	20%	13	18	13	18
E	> 65	< 5	10%	6	8	6	9
X	Not Tested	Not Assessed	-	45	16	67	10

* Tested Rust infection rate of wild commercial population was normalized at 50% (R50)

** Assessed Stem Straightness improvement of wild commercial population was normalized at 0%

The economics of an investment in forestation is an important component of landowners' decisions. The PRS rating of your Loblolly pine seedlings should therefore be an important consideration before you plant.

North Carolina DFR recognizes the importance of this decision and will make the PRS ratings of their seedlings widely available. NC DFR will also include the PRS rating on the label of every bag or box of improved Loblolly pine seedlings that they sell.

(Sample label on right)

Forest Geneticist Ken Roeder recommends forest landowners "Plant the best genetic seedlings that they can obtain. Plant the best seedlings on the best sites and conduct the best management practices for that particular site"

DIVISION OF FOREST RESOURCES
CLARIDGE STATE NURSERY

DATE: / /2006

SPECIES: LOBLOLLY PINE
PREMIUM FAMILY SELECTION
16P431180

SEEDLOT: A-3
NUMBER PER BAG: 1000

Deployment Region	Productivity	Rust	Straightness
PIEDMONT NC	30	B	B

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

Group Pictures from Fall Ranger Training at Crossnore with Level I Class on Left and Level II Class on Right

NC DFR Hosts International Foresters Visit to North Carolina

Barry New

In October, NCDFR once again had the good fortune to host the 22nd Annual International Seminar on Forest Administration and Management. ISFAM is an intensive 3-week cultural exchange and collaborative learning experience designed to enhance the management skills of senior-level foresters and natural resource managers from around the world. The 22 participants represented the following countries: Angola, Bosnia and Herzegovina, Brazil, Cameroon, Guinea, Indonesia, Israel, Jordan, Liberia, Madagascar, Paraguay, Russia, Senegal, Sierra Leone, Vietnam, and the USA.

Day one of the 2-day NC segment began with an opening session at the Archdale Building in Raleigh with talks from various forestry organizational leaders. The afternoon field tour included a day spent with Vance County landowner Preston Floyd on his 500-acre Stewardship forest.

Preston Floyd, Vance County Ranger Steve Cannon, WRC Stewardship Biologist Danny Ray, and others led the Field discussions. Day 2 began with a tour of the New South Lumber Co. facility in Alamance County, led by Procurement Manager Ron Phillips and Mill Manager Terry Bishop.

The afternoon schedule took us to Durham County and NC State University's Hill Forest for a tour and discussions featuring several management issues and research activities on the 2,450 acre research, teaching and demonstration forest.

Figure 4: Vance County Ranger Steve Cannon giving field tour for ISFAM

Forest Manager Joe Cox led tour stops that included a recent loblolly thinning, invasive species management, FSC and SFI certification, hardwood understory burning, an ecological preserve registered under the NC Natural Heritage Program and early successional habitat restoration (led by Assistant Forest Manager and graduate student Jimmy Dodson). Will Summer, NC DFR's Forestry NPS Specialist, featured a joint NCDFR-NCSU research project that will contrast and monitor water quality and sediment loading on paired watersheds before, during, and following forestry operations on the study.

Speaking on behalf of all 22 participants, Dr. Mike Wagner, Seminar Coordinator and Forestry Professor at NAU, expressed his sincere appreciation to all the individuals and organizations who came together to make them all feel welcome and for delivering an outstanding program.

Technology Transfer: Tools & Information to Manage Forest Stands

NC DFR Joins Forest Nutrition Cooperative (FNC)

Barry New

In January 2007, the NC DFR joined the Forest Nutrition Cooperative (FNC) as a corresponding member. The FNC is an internationally renowned partnership "committed to creating innovative solutions to enhance forest productivity and value through the sustainable management of site resources." The Coop, led by Dr. H. Lee Allen of NCSU and Dr. Tom Fox of Virginia Tech, traces its origins to the Forest Fertilization Coop, created in 1969 at NCSU. Its mission, breadth and depth have evolved over the years to become a world leader in research on intensive management of Loblolly pine.

The decision to join the Coop was an outcome of discussions and endorsement from the FM Planning Committee, and was later approved by the management team.

What benefits can I expect from DFR's membership in the FNC?

- Training/continuing education – Dr. Allen will be the keynote presenter at the R-2 SF meeting May 30 at Haw River State Park. Contact Mark Bost for further details. A second session will be planned sometime in 2007 that will be open to foresters and technicians unable to attend the R-2 session. Beginning in 2008, a full-day workshop will be scheduled each year and feature topics from your input.
- Additional consultation via email and phone with Lee Allen, Tom Fox and other staff of the FNC.
- Access to the FNC members-only website and content, including:
  - LobDSS – software that models plantation survival, growth and yield based on input variables such as soil and site conditions, hardwood competition, site prep methods and various silvicultural treatment options – herbicide, fertilization and thinning, for example. The model uses the FASTLOB2 Growth & Yield system developed by the Loblolly Pine Growth & Yield Research Coop at Virginia Tech. The model has an added financial analysis feature allowing customized inputs of treatment costs and expected revenues by product class.
  - NUTREM 2.0 – a model for predicting nutrient uptake during growth and nutrient removals during harvests.
  - Publications, Research Notes, and Region-wide Reports
  - Presentations from FNC meetings and workshops
  - Self study workshops on-line
  - A series of management aides and prescriptions
  - Members-only discussion forum
  - Contact meetings, workshops and field tours held annually and hosted by FNC member companies/organizations

Our membership allows all DFR employees access to the FNC Members only website.

You will need to download LobDSS and NUTREM 2.0 directly to your computer. You will need to contact Barry New, Technical Development, Planning & Utilization Program Head to register for a User ID and Password to gain access to the FNC Members only website and for follow-up questions. This member access information is not to be shared with other users.

FNC Website: http://www.forestnutrition.org/members/index.htm