Minutes of the 2007 CFGRP Annual Meeting held May 23 -24, 2007, hosted by Plum Creek Timberlands in Macon Georgia

The last stop of the CFGRP field tour, the Rinker Material Macon Rock Quarry.
**Field Trip**

The 2007 CFGRP field trip began with Paul Belonger of Plum Creek Timberlands introducing his Jesup tree improvement crew and giving us a brief overview of Plum Creek Timberlands. Our first stop was the Georgia Forestry Commission’s Seed Conditioning Plant located just south of Macon, Georgia. Steve Brock, plant manager, explained that current plant operation can process up to 600 bushels of cones per day, strives for a final seed moisture contents of 8%, and average germination rates of 95%, 90% and 85% for loblolly, slash and longleaf pine, respectively. The plant has the capability of storing up to 75,000 lbs of seed in their freezers and coolers. After the Seed Conditioning Plant tour our group dined on a delicious BBQ lunch provided by our host, Plum Creek. Our next stop was the USDA Forest Service National Seed Laboratory (NSL) where Victor Vankus (plant manager) and Jill Barbour guided the tour of the facilities. The NSL now works with many plant species for seed technology development, seed handling training, germplasm conservation and seed testing services. The NSL has served more then 400 clients for over 50 years. Our last field stop was the Rinker Material Macon Rock Quarry. This quarry was established in 1958 and has the largest quarry output in the state of Georgia producing over 5 million tons of granite per year. After a safety briefing we witnessed a quarry blast, toured the plant, and made the trip down 500 feet to the bottom of the quarry where everyone filled their pocket with granite laced with “fools gold”. As they say at Rinker, “if you can’t grow it, it has to be mined”. After returning to the motel, Plum Creek provided a social abundantly supplied with excellent food and drink plus good conversation. Many thanks to Paul Belonger and his crew for putting on such an informative and enjoyable field trip! Also, thanks to Russ Pohl for the tour of the GFC Seed Conditioning Plant.

**General Session**

**CFGRP Year in Review**

Greg Powell highlighted some of the many CFGRP activities for the year including:

1. The CFGRP collected the second crop of 3rd cycle full-sib slash pine seed and completed our fourth year of 3rd cycle slash pine breeding.
2. The CFGRP sent slash pine seedlots to the USDA Forest Service Resistance Screening Center for pitch canker screening. Also, pitch canker screening data was obtained from Florida Division of Forestry, Georgia Forestry Commission and Rayonier. A combined analysis was made resulting in parental rankings for 184 slash pine selections.
3. The first of the back cross one (BC1 = (slash x lob) x slash) seed was collected for the Introgression of Loblolly Pine Alleles into Slash Pine P-76 project. The BC1 seed along with open pollinated seed from all members of the pedigree was sent to Keith Palmer of Plum Creek for seedling production. These seedlings will be planted in a test this winter on SCC lands near High Springs Florida.
4. The CFGRP 2nd Cycle Florida Loblolly Pine Breeding and Testing Program P-77 project was formulated. The program will have 10 breeding groups, 15 selections per breeding group and 8 progeny tests.
5. The CFGRP measured 8 more slash pine full-sib block plantings which brings the total to over
60,000 trees measured at 5 years and 36,000 trees measured at 8 years.

6. There was no membership changes in the CFGRP for FY07 but several personnel changes. Chris Rosier left SSCC to become “Nursery Operations Manager” for Cellfor, Mark Davis, was promoted to “Maintenance Administrator” for the Florida Division of Forestry, Blackwater Forest, Todd Leeson became “Seed Orchard Supervisor” for the Rayonier Glennville seed orchard, Bob Purnell assumed the role of “Southern Tree Improvement Manager” for Weyerhaeuser Company. This spring Clem Lambeth announced that he is stepping down as “Southern Tree Improvement Manager” for Weyerhaeuser Company. Clem has had an outstanding 33-year career in tree improvement. Weyerhaeuser Company joined the CFGRP in 1995 and under Clem’s watch, the CFGRP has benefitted in many ways. To thank Clem, the CFGRP members presented him with a gift, a wooden bowl made of cherry, and the directors presented him with a certificate of appreciation. THANKS FOR EVERYTHING CLEM!

**CFGRP 3rd Cycle Breeding and Testing (P-72)**
Dudley Huber reviewed the CFGRP 3rd cycle breeding strategy for the mainline and elite breeding programs, updated our progress through 4 breeding seasons, and gave a report on flower and seed collection data. For the mainline breeding, two organizations are nearing 100% completion with their 3rd cycle slash pine breeding. All others members range from 10% to 75% completed. For the elite breeding about 50 of the 150 total crosses needed have been attempted and some seeds are in hand. The breeding will continue through 2008, progress will be reviewed at the CFGRP annual meeting in 2008 and the group will decide if breeding for the 3rd cycle slash pine program will cease or continue.

**Disease Screening CFGRP Selections (P-75 and P-76)**

**Pitch Canker Screening for CFGRP Slash Pine (P-75)**
The CFGRP sent 50 seedlots of remnant seed from PMXI and PMXII test series to the USDA Forest Service Resistance Screening Center (RSC) for pitch canker screening. Greg Powell along with Tania Quesada, Kathy Smith and Gogce Kayihan, all from the John Davis lab, measured lesion length at 2 months after inoculation. The standard RSC measure was taken at 5 months. Rayonier, Florida Division of Forestry and Georgia Forestry Commission sent the CFGRP staff results from their in house screening. Analysis was run across all sources of data and some of the results are as follows: 1) $h^2_{fam}$ for lesion length was 0.87; 2) $h^2_{fam}$ for RSC score was 0.5 when analyzed across all data; 3) $r_g$ for the two scores was 1.0; and 4) 184 parents were ranked for pitch canker resistance.

**Fusiform Rust Screening of F1 Slash x Lob Hybrid**
In the CFGRP pine hybrid trials, the slash x lob hybrid had much higher fusiform rust infection rates than either of the parental species. All slash x lob elite selections were screened for a known major fusiform rust resistance allele and not one selection contained the allele. These facts imply that the major gene rust resistance system operating in the parental species malfunctioned in the F1 hybrid. A family of F1 hybrid seed produced by Plum Creek is now being screened by the RSC in cooperation with Henry Amerson with a single genotype of the fusiform rust fungus. This inoculation should invoke a 1:1 segregation pattern for resistance. If the segregation pattern is 1:1 then the resistance allele is functioning normally and the
project will end. If the segregation pattern is not 1:1 then the resistance allele is not functioning normally and we will verify the presence of the resistance allele in the diseased plants and explore molecular genetic causes of the malfunction.

**Introgression of Loblolly Pine Alleles into Slash Pine (P-71)**

Liliana Parisi gave us a report on the early stages of her PhD project. The objectives of her project are: 1) Introgress loblolly pine alleles into slash pine; 2) Quantify variation for many traits in the back cross 1 hybrid (BC1) and compare it to the pure species; 3) Determine the phenotypic effects of introgressed alleles; and 4) Facilitate the introgression using available molecular tools to decrease linkage drag. The first BC1 seed along with open-pollinated seed from the BC1 ancestors was collected and sent to Plum Creek for seedling production. A field trial will be planted in the winter of 2007-08 on SSCC land near High Springs Florida. The test will be provide phenotypic characterization for the BC1 and pure species. BC1 material will also be screened for the presence of loblolly alleles using molecular markers and those markers associated with phenotypic characterization. With this project we hope to: 1) Enhance slash pine performance with loblolly pine alleles; 2) Gain knowledge for marker assisted selection and breeding; 3) Determine loblolly alleles functions in a slash background; and 4) Increase knowledge of differentiation between the genomes of slash and loblolly pine.

**Program Support and Royalty Distribution**

Early McCall presented an overview concerning changes in ownership of commercial forests over the last 20 years. Fifty-eight million acres were owned by vertically integrated forest products companies in the US in 1985. Now this has dropped to roughly 13.3 millions acres and most of this land is for sale. Of the roughly 32.7 million acres of timberland sold by vertically integrated forest products companies in the US since 1985, 25.1 millions acres are now owned by timber investment management organizations (TIMOs). This trend in timberland ownership is expected to continue and has had a serious negative effect on tree improvement programs in the Southern US. Most TIMOs do not participate in cooperative research but are willing to pay for good genetically improved planting stock. One solution to this problem is to organize a “Royalty Distribution” system where royalties collected from sales of genetically improved material are distributed back to the genetic material owners who can then use part of this money to continue genetic improvement. This system of royalty distribution has worked successfully for more than 10 years with over 40 agronomic crops.

**CFGRP 2nd cycle Florida loblolly pine breeding and testing program (P-77)**

The structure of the CFGRP 2nd cycle Florida loblolly pine breeding and testing program (P-77) was finalized this year. This program will have 10 breeding groups, 15 selections per breeding group for a total of approximately 150 selections and eight progeny tests. Each cooperator will be assigned one breeding group (except Weyerhaeuser will have two) and one progeny test. CFGRP staff will also be assigned one breeding group. There will be a mixture of backward and forward selections with growth and disease resistance given primary consideration. Stem form (wavy, sweep) and wood properties (specific gravity, stiffness) will also be considered where this information is available. The eight progeny tests will have 10 complete reps of approximately 300 trees per rep for a test size of around 3000 trees.
**Experiments measuring acoustic stiffness in standing trees (P-74)**

Good wood quality is desirable in all tree improvement programs. Unfortunately, quantifying wood properties is often expensive and difficult. As a measure acoustic stiffness is highly correlated with wood density, microfibril angle (MFA) and formation of compression wood. Greater stiffness as determined by higher velocity of sound through wood indicates lower MFA, lower amounts of compression wood and higher density. Three years ago the CFGRP purchased one-third interest in a Director ST300. This is a high throughput machine that can measure acoustic velocity (stiffness) in standing trees. Using the Director ST300, 6 reps at 6 CFGRP slash pine PMXI tests, 3 reps at 4 CFGRP pine hybrid tests and 4091 trees in 1 FBRC PPines test have been measurement for stiffness. Some results from the PMXI measurement are: 1) Individual-tree across-site heritability for stiffness was calculated as 0.42; 2) Stiffness is not genetically correlated with volume or dbh; 3) Stiffness has a slightly positive genetic correlation with height; 4) The type B genetic correlation was calculated as 0.68; and 5) Gains from selection for stiffness are comparable to volume as a percentage of the mean. Some results from the Hybrid trial measurements are: 1) Taxa stiffness ranked highest for slash, then lob, and then the slash x lob hybrid; 2) Taxa-by-site interaction was significant, but without rank change; 3) Regressions of stiffness on MFA had a $r^2$ values from 0.34 to 0.44; and 4) MFA means for taxa were the inverse of the stiffness means i.e. the hybrid had the highest MFA. Some results from the PPines measurement are: 1) The main effect of spacing was significant with narrow spacing producing wood with greater stiffness than wide spacing; 2) Family differences were significant; and 3) Culture-by-family effects were significant before adjusting for height to dbh ratio.

**Upcoming CFGRP Activities**

1. 14 - 5, 8 or 12 year full-sib block plot measurements are due.
2. 10 - 6th year Florida loblolly pine wild seed trial measurements are due.
3. 8 - 6th year PMXII test measurements are due
4. We will continue the CFGRP 3rd cycle slash pine breeding and testing program.
5. After taking the 6th year Florida loblolly pine measurements we will analysis the data, assign selections to breeding groups, make the selections, collect scion and top graft into mature seed orchard trees.
6. Measure 6 reps in the 10 - 6th year Florida loblolly pine and 8 - 6th year PMXII trials for acoustic stiffness.
7. Continue the cooperative effort, pitch canker screening of CFGRP slash pine selections.
Business Meeting

Business Items

Membership
There were no CFGRP membership changes for FY07.

Test Measurements
1. We will add wavy measurement to the 6th year Florida loblolly pine wild seed trial measurements.
2. Eliminate the lean code measurement. Trees leaning greater then 15 degrees from vertical will be giving a status code of 8 (unable to measure volume accurately).

Proposals
The CFGRP will schedule a “brain storming” meeting for late August to develop ideas for improving on the CFGRP tree improvement funding model.

Slash Pine Breeding Program
The CFGRP will continue mainline and elite breeding for the 3rd cycle slash pine program. Cone and seed yield data will continue to be collected. At the CFGRP annual meeting in 2008 we will decide if breeding for the 3rd cycle slash pine program will cease or continue.

Florida Loblolly Pine Breeding Program
Test measurements are due by the end of November. Data will be analyze in December. Selections will be made in January. Selections will be top-grafted in February 2008. And selections will be clone banked by CFGRP staff at UF’s Austin Cary Memorial forest in February 2008.

Fiscal Matters
The actual budget for FY06, the projected budget for FY07 and the proposed budget for FY08 were presented. The proposed budget for FY08 was accepted without change.

Executive Committee
The 2008 executive committee is Bob Purnell (chair), David Adams (future chair) and Russ Pohl (past chair). The next CFGRP annual meeting will be hosted by Packaging Corporation of America. Our thanks to the 2007 Executive committee Russ Pohl (chair), Clem Lambeth (future chair) and David George (past chair) for a job well done.