COOPERATIVE FOREST GENETICS RESEARCH PROGRAM

Minutes of the CFGRP Annual Meeting held May 2-3, 2005

CFGRP Field Trip
Early McCall began the field trip with a brief overview of Rayonier operations and land holdings. The tour then divided into two sessions with Early explaining the tree breeding equipment that he uses and talking about his methods of pollen collection and extraction, and Bobby Caulder giving a tour of the Rayonier Research Center pollen extraction lab. We then went to the 2001 Rayonier Florida loblolly pine trial and discussed measuring hurricane damage and taking a 4th year growth assessment to determine if these trials will be large enough for final measurement at age 5. The next stop was the Rayonier PMX I trial. There we discussed the 8th year measurement coming up next winter. Also at the PMX I trial, John Anthony of Weyerhaeuser demonstrated sweep measurement, and Gary Peter talked about and Xiabo Li demonstrated measuring wood stiffness using the Director ST300. At the end of the field trip, a tasty barbecue dinner was provided by Rayonier at their Crandall picnic area. Many thanks to Early McCall and crew for putting on such an informative and thought provoking field trip!

General Session
CFGRP Year in Review
Greg Powell highlighted some of the many CFGRP accomplishments for the year:

1. 1st, 5th and 8th year measurements were taken on 200 slash pine full-sib block plots;
2. The last 3rd cycle slash pine subline was top grafted;
3. We estimate that we are 50% done with the mainline breeding;
4. The 60 elite hybrid selections were photographed, GPS’ed and clone banked in at least one location;
5. Needle samples were collected from the slash X loblolly elite hybrid selections, and DNA was extracted and sent to two genetic marker labs;
6. We began the first elite hybrid crossing;
7. Needle samples were collected from 19 of the new Florida loblolly pine selections for the
8. Alex Medina finished his analysis and report and will be graduating in June 2005;
9. Salvador Gezan is finishing his analysis and report and will be graduating in Dec. 2005;
and
10. Liliana Parisi is finishing her data collection. Her analysis and report will be finished by Dec. 2005.

Grants
Gary Peter gave an overview of the National Science Foundation grant to perform allele discovery in loblolly pine, and Dudley discussed a USDA CAP proposal to investigate practical application of allele discovery to breeding. The funding from these opportunities will have a positive impact on CFGRP research.

CFGRP 3rd Cycle Breeding
Dudley Huber reviewed the CFGRP 3rd cycle breeding strategy for the mainline and elite breeding programs, updated our progress, and gave some guidelines for implementation. Coop wide, we are approximately 50% finished with the mainline breeding with one breeding group at near 100% completion. This past breeding season, we also began the elite breeding program.

Topgrafting 3rd Cycle Slash Pine Selections
Alex Medina reported the final results from “Survival and Promotion of Female and Male Strobili by Topgrafting in a Third cycle Slash Pine Breeding Program”. A total of 2561 topgrafts were established in the winter of 2003. Overall survival after one year was 72.6%. Fifty-three percent of the topgrafts produced flowers after one year and of those, 63% produced female flowers, 23% produced male flowers and 14% produced both male and female flowers. The top and mid-top crown position proved to be the most efficient in both survival and flower production. Large differences were found among topgrafted clones and interstocks in survival and production of flowers. Therefore, it is important to identify and select interstocks that promote good topgraft survival and flowering.

Design and Analysis of Forestry Clonal Experiments
Salvador Gezan reported the preliminary results from “Design and Analysis of Forestry Clonal Experiments: Spatial Analysis”. This project will quantify the efficiencies of implementing classical and non-classical statistical techniques to account for spatial variability in clonal trials and determine which techniques are the most efficient, e.g. performing well under a broad set of conditions. Some of his conclusions are single-tree plots are best, use design with small incomplete blocks, don’t worry about 25% or less mortality, use post-hoc blocking when needed, stay with simple designs when possible, and model the residual correctly.

Shoot Elongation Patterns and Genetic Control of Height Growth . . .
Liliana Parisi reported preliminary results from “Shoot Elongation Patterns and Genetic Control of Height Growth in Pinus taeda L. Using Clonally Replicated Trials”. This study looks at shoot elongation patterns in clones grown in two different environments (one near
Palatka FL, the other near Cutberth GA). Measurements have been taken on growth initiation and cessation, and are now being taken on number of flushes, length of flushes, number of stem units and mean stem unit length. Liliana will complete these measurements this summer. With this data she plans to determine the relative contributions of these different traits to total height growth and to estimate genetic parameters, genetic architecture and seed source effects for phenological characteristics.

**Methods for Measuring Wood Stiffness**
Gary Peter presented a talk on “Approaches and Methods for Wood Phenotyping: Measuring Wood Stiffness”. Wood property phenotyping can be used to help maximize the value of each stem through the introduction of wood quality into breeding and selection programs. His research project will compare stiffness measurement taken with the Director ST300 with direct acoustic measurements of wood properties on cores from clonal tests. Because of the speed of measuring in-tree stiffness, the Director ST300 should be a valuable tool for introducing this trait into our breeding and selection program.

**Seed Orchard Pest Management Subcommittee Update**
Tom Byram updated us on problems in keeping pesticides registered for use in seed orchard protection. Based on some assumptions, he estimates that a crop of seed from one acre of improved seed orchard is worth between $200,000 and $600,000. On the other hand, there are only a few total acres of seed orchards in the United States and the cost to register pesticides for seed orchard use is high. Therefore, pesticide companies are reluctant to register pesticides for seed orchard because of low returns. Tom listed four possible solutions to this problem: 1. Have the seed orchard industry pay for the 24C registration for seed orchard use; 2. Have seed orchard managers make bulk purchases of pesticides; 3. Help 3rd party vendors license the technology; and 4. Defray some of the cost of pesticide registration.

**CFGRP Activities**
Greg Powell outlined some of the many CFGRP activities for the coming year:

1. Topgrafting release at the end of May or in early June;
2. Full-sib cone collection from 3rd cycle slash breeding in September;
3. PMX I and FSBP test measurements in November;
4. Slash mainline and elite breeding in February;
5. Elite hybrid archival and breeding in February and March; and

**Business Meeting**

**Fiscal Matters**
The actual budget for fiscal year 03-04, the projected budget for fiscal year 04-05 and the proposed budget for fiscal year 05-06 were presented. The proposed budget for 05-06 was accepted without change.
**Other Business Items**

*Membership*

The CFGRP staff was asked to put together criteria for CFGRP membership in two categories, full and associate membership. These guidelines will be edited by the executive committee, presented to the advisory council and voted on by CFGRP members.

*Elite Hybrid Selections*

Ownership of elite hybrid genetic material was discussed. It was decided that:

1. Elite hybrid selections belong to the member that made the selection;
2. Elite hybrid breeding done through a cooperative effort belongs to the members of the CFGRP; and
3. Material generated through in-house programs from the elite hybrid material belongs to the member doing the work.

*Test measurements*

1. We will not take the scheduled 12-year measurement in the hybrid trials.
2. We will take wood stiffness measurements in the PMX I trials using the director ST300.
3. Sweep will be added as a standard measurement on all CFGRP progeny tests.
4. A status code of 3 to identify rust bushes will be added to our standard status codes. CFGRP staff will produce pictures and descriptions to aid in the classification of rust bushes. Trees with a status code of 3 will not be measured for height or dbh.
5. CFGRP staff will measure SJPC tests when they are scheduled to be measured.
6. Clem Lambeth inquired about measuring wood properties on slash, loblolly and their hybrid in the CFGRP Hybrid Trials. The CFGRP membership indicated their interest in pursuing the project. Because of the interest in measuring wood properties, the hybrid trials will not be abandoned until this research is completed.
7. Because of hurricane damage CFGRP trials, lean will be assessed in 15 degree classes from vertical. Any tree with more than 15 degree lean from vertical will not be measured for height and dbh.
8. This year, at the end of the 4th growing season, height will be measured on a subsample of trees in the PMXII and Florida loblolly series to determine when the final measurement of these trials (age 5 or 6) will be taken. CFGRP staff will send out electronic forms for these measurements.

**Executive Committee**

The 2005 Executive Committee members are David George (Chair), Russ Pohl (Future Chair), and Paul Belonger (Past Chair). Our thanks to the 2004 Executive Committee (Paul Belonger, Chair; David George, Future Chair; and Mark Davis, Past Chair) for their leadership during the past year. Special thanks go to Mark Davis who will rotate off of the CFGRP Executive Committee after three years of service.