

Carolinas Chapter 2007 Activities Report October 2007

Membership

The chapter has 439 total members, 350 of whom are residents of North Carolina, 80 from South Carolina, and 7 from several other states. (Data is from late July 2007.)

Orchards

The chapter has 26 orchards or farm plantings ranging from just south of the Virginia border in North Carolina to just north of the Georgia border in both North and South Carolina. Nine of these are known to have infestations of *Phytophthora cinnamomi* (confirmed by Steve Jeffers of Clemson University). The plantings in several orchards have been completely killed by the *Phytophthora* pathogen, but the news is not all bad: chestnuts screened for *Phytophthora* resistance have been planted in the *Phytophthora*-contaminated fields of Joe James' farm for more than three years now with good survival rates.

With this year's new plantings, the chapter has now achieved its goal of establishing orchards growing chestnuts that represent at least 20 lines of local American parents. This new plantings are doing well, even in the face of this year's exceptional drought. Our orchards sites are found on individual landholdings, commercial and industrial properties, educational institutions, and local and state public lands. We are indebted to all of our cooperators, and to Paul Sisco for organizing and managing this complex operation.

We have selected a promising potential site for the development of a larger scale chapter seed orchard, and it appears likely that funding for the purchase of the site will be available. We have begun the planning required to establish a second seed orchard that will be the central site for the development of lines of what we've been calling "low-elevation" chestnuts. This is to distinguish lines of chestnuts with American parents from the Piedmont and coastal regions from those lines with higher elevation, mountain parents. Perhaps more importantly, these lines will be developed with *Phytophthora* resistance for survival across the large *Phytophthora*-contaminated regions outside the Appalachians.

Research

1. *Phytophthora*

Joe James's work in *Phytophthora cinnamomi* is now becoming well known in the national organization and internationally. This program has been ongoing for the

past four years. Thus far it offers hope that the current pool of hybrid chestnuts demonstrates some diluted resistance to Phytophthora. Approximately 25% of the families tested show some level of Phytophthora resistance. However, only 2.5% of all seedlings planted appear to be able to survive long term in the presence of Phytophthora. By using these surviving seedlings, we hope to be able to create a gene pool where F2 and F3 generations can be produced that exhibit even greater levels of resistance. We have thus far screened 75 families (lines) of hybrid chestnuts and hope to complete screening of the remaining existing lines in 2008.

Also in the next year, we plan to test Nanking BC1 progeny, which should show the segregation of genes for resistance and give us some insight into the genetic pattern of resistance inheritance. The strongest survivors of this BC1 test will be placed in their own separate orchard and allowed to mature. These trees can be further back-crossed to begin additional lines resistant to both blight and Phytophthora.

Burt Abbot and Lauri Georgi of the Genetics Department at Clemson University are developing genetic maps from seedlings in the Phytophthora experiments at Chestnut Return farm. The goal is develop a set of genetic markers that can be used to distinguish between susceptible and resistant seedlings. When this pattern is overlaid with previous genetic maps obtained by John Frampton of NC State University, inferences can be made as to the location of resistance genes.

Joe James and Steve Jeffers delivered a paper on their Phytophthora work this summer to a conference of the International Union of Forest Research Organizations in Asilomar, CA.

2. Rooting Leaf Cuttings

We gathered leaf and stem samples from root sprouts and large longer-term surviving chestnuts across our two states for use in a rooting experiment undertaken by Bob Head of Seneca, SC. Bob prepared over 120 cuttings from our samples, and used them in a matrix experiment of rooting hormones and inorganic salts known to encourage root growth in oaks. The cuttings were placed into small pots with controlled rooting solutions, and grown in a commercial rooting nursery. Many of the cuttings developed calluses on the stem (a precursor for root generation), and by the end of the summer, four samples from two groups of clones had developed roots. As far as we know, this is the first time that American chestnuts have been successfully rooted from cuttings.

Father Tree Program

148 B3 nuts were harvested from a Graves mother tree on the Wagoner farm in Meadowview that was pollinated from a father tree located in Crowder's Mountain State Park in North Carolina near Charlotte. Nuts were also harvested

from a second Graves mother tree pollinated from a father tree near Lake James, NC.

Blue Ridge Parkway Harvesting

With the help of several volunteers, and thanks to a permit from the Parkway biologists, we were able to harvest 1275 pure American chestnuts (open pollinated) from Blue Ridge Parkway trees this year. Trees were harvested along the length of the Parkway from Alleghany County to Transylvania County. Paul Sisco will use the collected seed for his programs in the south, and surplus seed will be sent to Greg Miller in Ohio for distribution in the TACF seed kits.

Outreach and Endowment

Our chapter has an ongoing number of activities for membership participation and education throughout the year. For example, our outgoing president, K. O. Summerville, gave a number of presentations on chestnuts and chestnut restoration across North Carolina as part of the North Carolina Forestry Association Teacher's Tour. Our chapter website is continually updated by our new vice-president, Doug Gillis.

Also under K. O.'s guidance, we established and provided the initial funding of an endowment vehicle within the NC State Forestry Foundation. The goal is to help provide funding for orchard development and seed production in the future.