



# The Kentucky Railsplitter

Summer  
2004

Newsletter of the Kentucky Chapter  
of the American Chestnut Foundation

## *Working to Restore the American Chestnut*

*Volume 3, Number 1*

### **The President's Corner**

Dear Fellow Members,

As we enter our fourth year as a chapter, there are some very positive happenings I can report to you. When Dr. Chuck Rhoades left the University of Kentucky for Colorado, he left behind a huge void we have struggled to fill. Our newsletter, *The Railsplitter*, which he published has not been published since he left. I am happy to report that Marilyn Freidhof has graciously agreed to put out our newsletter. Thank you Marilyn!

The next bit of good news is that Mike French, a UK student, will be an intern for us thanks to the grant procurement skills of Dr. Paul Sisco and Phil Pritchard of our Asheville, NC office. Mike will be invaluable to us during the breeding season. Welcome aboard Mike!

The third positive item is the strong support of the Kentucky Division of Forestry, without whose help our breeding program simply wouldn't be happening. Thank you to KDF from the bottom of our hearts!

We also continue to receive strong support from the KY Dept. of Fish and Wildlife Resources and the University of Kentucky. The Department gives freely of their employees' time and hosts many of our meetings. The University supports one of our breeding orchards at Robinson Forest and provides invaluable help with storage and care of our chestnuts and seedlings.

We have gained two new partners in Berea College and the Homeplace on Green River. Both of these partners will host breeding orchards for us. A special thanks to John Perry at Berea College and Billy Jo Fudge at the Homeplace.

Mark Dupoy of Mammoth Cave National Park has helped tremendously through his purchase of pure American Chestnuts from the chapter. These funds will be used to rent bucket trucks for our breeding trucks.

*see President on pg. 2*

### **Company's Coming!**

#### **Kentucky to Host National Meeting in 2005**

By: Dr. Ray Hornback, National Vice-President, TACF

The Kentucky Chapter of The American Chestnut Foundation will play host to the annual meeting of TACF in the fall of 2005. The dates are October 28-30 in Lexington at the Marriott at Griffin Gate located at I-64/I-75 at Newtown Pike.

This is the first ever TACF national meeting to be held in Kentucky. The 2004 national meeting will be held in Asheville, NC in October of 2004 (see pg. 2)

Rex Mann, Kentucky Chapter President, said "When Ray Hornback and I extended the invitation to TACF to hold its annual convention here in Kentucky, we did so knowing that it would involve a great deal of work for the Kentucky Chapter. But I feel certain that our members will come forward and provide the necessary help to make the 2005 gathering one we will all be proud of."

Mann added, "We sincerely hope that each of you will mark the dates on your calendar and plan to join us so the other state chapters will see what a dedicated group of people we have here in Kentucky. We are working with the national office staff in developing an outstanding program and if you have any suggestions, please let us know."

The Chapter will need to raise \$5000 to support the 2005 annual meeting. Corporate, business, foundation and individual sponsors are also needed to help underwrite the four-day meeting. Members who wish to donate or who have thoughts on where we may seek help, please call Dr. Ray Hornback at 859/299-5616 or Rex Mann at 859/745-3123.



# The American Chestnut Foundation Kentucky Chapter

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## Newsletter

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*President continued from page 1*

We do need to bring in new members and I ask each of you to try to recruit one new member in the next three months. Explain our work to friends and neighbors and let them know how they can be part of the largest restoration program in our nation's history.

I am grateful to you, the members of the Kentucky Chapter, for your continuing support. We are closer than ever to restoring the American Chestnut. I am optimistic about our future.

**Rex Mann**  
**Kentucky Chapter President**

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## TACF Annual Meeting in Asheville, NC

The 21st Annual Meeting of The American Chestnut Foundation will be held October 29-31 in Asheville, NC featuring guest speakers, workshops, and technical presentations.

The weekend will begin Friday evening with a special presentation on the role of chestnuts in Appalachian life by folklorist and storyteller Dr. Charlotte T. Ross.

Saturday morning will begin with chestnut woodcarving demonstrations and a program on *Applying Biotechnology to American Chestnut Restoration* by Dr. Scott Merkle. Dr. Hill Craddock will describe the *Chatanooga Chestnut Project*. Dr. John Frampton and graduate student Mollie Bowles will share information on her research with *Genetics of Resistance to Phytophthora Cinnamomi in Chestnuts*.

Lunch and self-guided tours of

the Biltmore Estate and a presentation on the estate's landscaping will take place on Saturday afternoon

Detailed information including agendas, accommodations and costs will be posted on the web site [www.acf.org](http://www.acf.org) or information may be obtained by contacting Elizabeth Daniels, Membership Director, The American Chestnut Foundation, PO Box 4044, Bennington, VT 05201. 802-447-0110. E-mail to : [Beth@acf.org](mailto:Beth@acf.org)

## Kentucky Chapter Membership News

Membership in the Kentucky chapter of the American Chestnut Foundation has dipped below the 200 mark for the first time since its inception and the board of directors, meeting in Frankfort in early April, discussed ways of encouraging all members to recruit new members.

Nationally, TACF has over 5,000 members and several other states have shown significant increases in membership in the past several years.

Rex Mann, Kentucky chapter president said, "If each current member in Kentucky would recruit just one new member with a sincere interest in helping bring back the American chestnut, we could double our membership and have a much stronger state chapter".

The Kentucky chapter has a table top display that can be set up at events and festivals to spread the word about TACF and the work that the Kentucky chapter is involved in. Membership brochures are also available by calling Rex Mann at (859) 745-3123 or Dr. Ray Hornback at (859) 299-5616. Either would be glad to hear from you.

The board would also like to hear from you if you have ideas on how new members can be attracted to our great organization.

## 2004 Annual Meeting

The Kentucky Chapter of TACF held its 3<sup>rd</sup> annual meeting on May 15, 2004 at the Homeplace south of Campbellsville in Taylor County. The Homeplace is the location for three of the KY Chapter's chestnut breeding orchards.

Retired forester, and talented writer, Billy Fudge thanked chapter president Rex Mann with the presentation and reading of an original poem. The poem was a tribute to Rex's hard work and dedication to the restoration of the American chestnut tree in Kentucky.

Dr. Paul Sisco, Regional Science Coordinator out of TACF's Southern Appalachian Regional Office, talked about a coordinated regional breeding program. The KY, TN, and NC/SC chapters will work together to develop one regional seed orchard. The basic plan is for all 3 chapters to work as a single group to create 20 independent BC3 lines of 'Clapper' as well as 20 independent BC3 lines of 'Graves'. 'Clapper' and 'Graves' are the names associated with 2 different sources of blight resistance from Chinese chestnut trees. The resultant BC3 lines would then be intercrossed to produce BC3F2 progeny to be planted in a regional seed orchard in western NC.

The regional orchard is called a seed orchard because the BC3F2 trees will intercross and produce the nuts that will be used to repopulate our eastern forests with American chestnut trees. As an aside, Dr. Sisco made it clear that the states with the highest number of volunteers made the fastest progress towards the goal of regionally adapted, blight-resistant American chestnut trees.

Professor Joe Schibig of Volunteer State Community College in Gallatin, TN provided details

about the locations of large surviving American chestnut trees in south central KY and north central TN. These large survivors, that include trees in Adair, Metcalfe, Monroe, and Clinton counties, KY are often associated with the Fort Payne geological formation, which caps much of the eastern Highland Rim ecological region of KY and TN. Soils derived from this formation are well drained, somewhat acidic and cherty. The majority of trees have been discovered on the upper slopes of west and south facing ridges. These chestnut trees usually grow in association with chestnut oak, red maple, sourwood, mountain laurel and blueberry bushes.

Finally, Dr. Hill Craddock, professor at the University of Tennessee at Chattanooga, talked about his chestnut research and breeding which support and expand upon TACF efforts. Dr. Craddock is an expert tree grafter. He created 10 clones of the Adair County tree through bud grafting and plans to determine if our KY tree is naturally blight resistant or if hypo-virulence is the primary factor in the tree's survival.

Dr. Craddock is using grafting to diversify his breeding stock. He sent a student into the backcountry of the Great Smokey Mountains National Park last summer to collect buds from surviving American chestnut trees. The clones from those trees are now part of his breeding efforts.

*-Scott Freidhof*

## Chestnut Day

Three years ago when the KY Chapter was organized, a small chestnut planting was done in Indian Creek near the Red River Gorge. This was a BC-3 planting (Back Cross 3) that duplicated some of the plantings at Meadowview, the TACF research farm in VA.

The KY Chapter was never able to complete the planting and has had problems caring for it. For the past two years a group called *A Lasting World* has worked on maintaining the planting with help from some employees on the Daniel Boone National Forest-Stanton District, mainly Leigh Grench and Rita Wehner. This year's 15 volunteers (up from 8 last year) came from all around - Indiana, Illinois, Kentucky, Massachusetts and Rhode Island.

During the day the group was able to mulch 6 of the 9 planted rows with straw bales and newspaper provided by the Stanton District. Next year the mulching should be easier since all the rows have been previously mulched and the weeding goes faster. There were a total of 167 live trees this year which is down from last year's 238 live trees. The tallest trees seem to be nearest the tree line with the tallest being about 4 feet, although most were still less than a foot tall.



*2004 Chestnut Day Volunteers*

*Members of A Lasting World gathered in the Red River Gorge to care for the chestnut plantings.*

## 2004 Kentucky Pollination

Mike French (Kentucky Chapter Intern) was charged with the responsibility of coordinating pollination efforts this year. Mike worked long hours and drove many miles to get the job done. Each tree required at least 2 visits during the month of June. On the first visit, bags were placed over the female flowers to prevent fertilization by unwanted pollen. During the second visit, the flowers were manually pollinated and the bags secured over the flowers again. Pollen was mailed to Mike from The American Chestnut Foundation's Virginia research farms. There was often more than one female flower or bur in each bag, but the production of seed nuts averages out to one per bag.

The 6 trees pollinated this year were spread out from Letcher County in the east to Marshall County in the west. Hopefully, the 6 trees will produce 5 new lines (i.e. 100 viable seed nuts/tree) of third backcross (BC<sub>3</sub>) offspring. The following table provides more detail:

TREE #	COUNTY	# BAGS	POLLEN SOURCE
1	Adair	1,229	GL185 (200), AMERICAN* (1,029)
2	Clinton	260	AB54 (100), BE134 (160)
3	Letcher	80	GR331 (80)
4	Marshall	110	GL94 (110)
5	Wayne	220	BE138 (220)
6	Webster	25	AB419 (25)

\*Pollen from 3 KY Americans and 3 TN Americans

The technique for pollinating flowers was more involved than simply brushing a male catkin across a female flower. Mike carried a water bottle into the canopy and sprayed each female flower prior to dipping it into a cap full of pollen dust.

Reaching the canopy of some of the trees was challenging. The Letcher County tree, for example, was located on a heavily forested ridge top at an elevation of 1840 feet. Trucks with 4-wheel drive were used to climb a dirt road up the mountain to within a ¼-mile of the tree. An ATV trail provided a walking path to within 100 yards of the tree. The remainder of the walk was uphill through the forest. Four volunteers each carried a 10-foot section of a triangular metal tower (similar to a cell phone tower) to the tree. The 40-foot tall tower was pieced together on the ground and raised into a vertical position adjacent to the tree with ropes and muscle power. Mike climbed to the top of the tower numerous times to bag and pollinate flowers. The tower idea was conceived by the landowner, Robert Watts, who is also manager of Lilley Cornett Woods (an old growth forest owned by Eastern Kentucky University).

Mike wishes to thank the many people and agencies who helped with pollination this year.



## Phytophthora: The Original Chestnut Blight

Reprinted with permission from Carolinas Chapter TACF Spring 2004

The American chestnut was once prevalent in the forest ecosystems throughout the eastern United States, where it was prized for both its mast and its timber value. The demise of the American chestnut by the chestnut blight was dramatic to say the least; for generations to come, this catastrophe will likely remain the poster child of a species destroyed by an introduced disease. But while the blight wiped out the chestnut from the hills and the mountains, many people today do not realize that before the blight another disease had already wiped out chestnuts that were growing in the warmer regions of its range which extended even into the Coastal Plain!

This disease is commonly known in chestnuts as "ink disease" since it causes a blackish, inky substance to exude from the base of infected trees. The pathogen, or cause of the disease, is a fungus called *Phytophthora cinnamomi*. The problem with this disease is that most, if not all, infected chestnuts were killed – that is, the American chestnut has little or no resistance to *Phytophthora*.

*P. cinnamomi* was introduced into the United States supposedly through a southern port in the 1700's. From there, it spread slowly northward. Along the way, this soil-born fungus infected many tree species and consistently caused mortality when it infected American chestnut. In the late 1800's and early 1900's, serious concern arose for chestnut's plight due to *Phytophthora*. Unfortunately, a fresh disease was soon raging throughout the East, and concern

due to the blight quickly overshadowed the importance of Phytophthora. In fact, so many trees were being destroyed by the blight that the Phytophthora studies were lost.

Besides the comparative drama of the blight and Phytophthora, there are several other major differences between the two diseases. First, Phytophthora is a root rot; it attacks and causes decay of the feeder roots of a tree, eventually moving to the major support roots and destroying them as well. Because its roots are dead, a susceptible tree that is infected will die. The blight, on the other hand, only causes dieback of the tree crown. The root system is unharmed, which is why blight-infected trees, can produce stump sprouts.

Second, *P. cinnamomi* is generally limited to warmer, more moist climates. Its threat is, therefore, limited mostly to the South. The blight, on the other hand, is not deterred by climatic variation and has been the bane of chestnuts from Maine to Georgia.

Third, *P. cinnamomi* is a fungus that is found in the soil, and can be carried through the ground by water, while the blight is often transported by the wind above ground. While *P. cinnamomi* generally spreads much more slowly across a region than blight does, its effect can be said to be more permanent.

Because the blight caused such a dramatic demise, much attention has been placed on breeding blight resistance into American chestnut. This is being done by the Foundation by crossing American chestnut with Chinese chestnut and then backcrossing the progeny to American chestnut. Hybrids and backcrosses are mainly selected for blight resistance and American

growth habits, vigor, and morphological characteristics (such as leaf shape and twig color). This way, the final selections that will be reintroduced into the wild will essentially be blight-resistant American chestnuts.

Unfortunately, *P. cinnamomi* is still present in a good portion of the original chestnut range so that unamended restoration efforts in these areas are likely to fail, at least partially. In fact, several instances of Phytophthora mortality in research trials in Tennessee and Carolinas have already confirmed this. Thus, some breeding lines of chestnut possessing resistance to both blight and Phytophthora are needed to ensure successful chestnut restoration in the southern part of its range.

My graduate research at N.C. State University will investigate inheritance of Phytophthora resistance in chestnut toward this end. Preliminary results using controlled inoculations of greenhouse-grown seedlings with *P. cinnamomi* suggest that Chinese chestnut is resistant while American chestnut is largely susceptible. Interspecific F1 hybrids are also resistant indicating that genetic control of resistance is dominant. Resistance segregation patterns in B1 and B1-F2 crosses suggest control by a single locus; however, sample sizes to date have been relatively small.

Upcoming research will use molecular genetic markers to verify the type of inheritance of Phytophthora resistance in chestnut and develop a map of the resistance locus (or loci). Hopefully, this work will yield a reliable, but non-lethal method of identifying Phytophthora resistant seedlings. Additionally, it will provide knowledge needed to design and implement new

resistance screening strategies. These strategies will be aimed at developing breeding lines of American chestnut that are resistant to both blight and Phytophthora. Thus, this research should provide valuable tools toward long-term restoration of American chestnut throughout its real original range.

*Mollie Bowles*

*Mollie E. Bowles is a Carolinas Chapter-TACF member and a student in the Department of Forestry at NCSU. She is studying for her Master of Science degree under Drs. John Frampton, Henry Amerson and Larry Grand. She graduated from Samford University in Birmingham, Alabama, in 2003 with a Bachelor's degree in Environmental Science. The extreme ecological significance of the American chestnut lured her attention, and she is greatly enjoying her opportunity to play a part in the restoration of this magnificent species.*



## The Electronic Newsletter

The Kentucky Chapter of the American Chestnut Foundation is looking for ways of becoming more efficient with our newsletter, the Railsplitter. We realize that many people enjoy receiving a printed copy of the newsletter, however, the newsletter can also be viewed on-line through the Kentucky Chapter's web page.

The chapter will continue to mail out a hard copy of the newsletter to those who want it, but by viewing the newsletter on-line you save the chapter mailing and printing costs.

If you choose not to receive the newsletter by mail the chapter will send you an e-mail reminder when the next edition of the Railsplitter is available on the web site. Please send an e-mail to Marilyn Freidhof at [marilynf@mikrotec.com](mailto:marilynf@mikrotec.com) stating that you would like to be removed from the mailing list and added to the e-mail reminder list.

To find the Kentucky Chapter's web site,

- go to [www.acf.org](http://www.acf.org)
- Click on the State Chapters link.
- On the map, click on Kentucky.
- Click on the newsletter link.

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