DEDICATED TO RESTORING THE AMERICAN

Chestnut Tree

The Pennsylvania Chapter of The American Chestnut Foundation

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JOIN US AT THE SPRING 2006 MEMBERS AND GROWERS MEETING

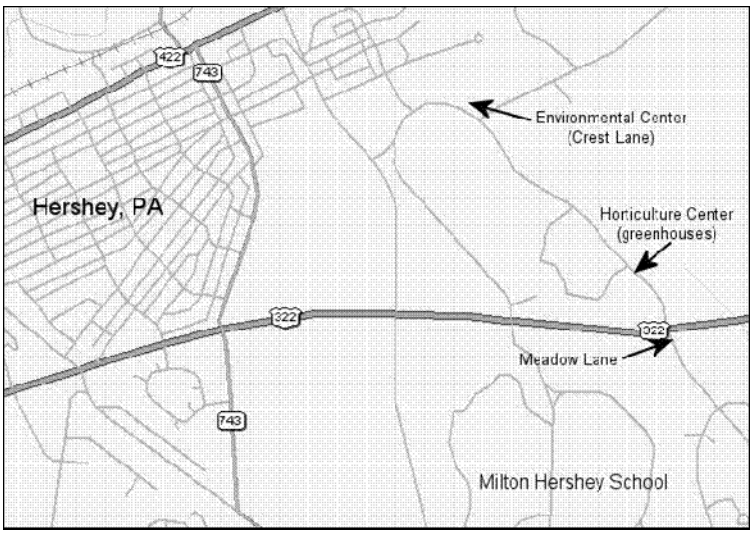
The Spring Chapter meeting will be held Saturday, March 18 at the Milton B. Hershey School Environmental Center, Hershey, PA. We'll start our day with a coffee reception at 8:00 a.m., followed by a day of engaging information sharing, workshops, and two speakers.

One of our speakers is Jim Nelson, former Director of the Bureau of Forestry, DCNR, who will be presenting "*Pennsylvania's Forest History*."

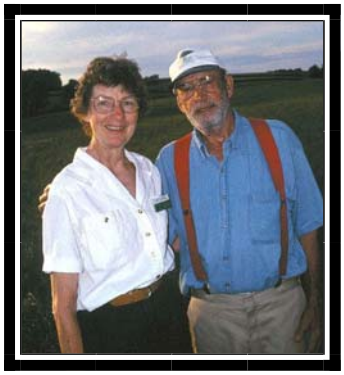
Our other guest speaker will be Eric Burkhart, Penn State School of Forest Resources doctoral candidate, who will be presenting "*Agroforestry and American Chestnut restoration: what's the connection*?"

We'll also have workshop sessions on inoculation, planting, and pollination. Grower supplies including seeds, soil test kits, fertilizer, and herbicide will be available.

Enjoy coffee, a catered lunch, and tons of chestnut information and fellowship— just $5.00 at the door!



LEFFEL CENTER OPENS AT PENN STATE UNIVERSITY



The Leffel Center was officially opened during PA-TACF's Fall meeting. The Center is dedicated to Dr. Robert and Ann Leffel of Brogue, PA, for their chapter leadership, scientific guidance and dedication to the restoration of the American chestnut tree to our forests. The Leffel Center is located at 206 Forest Resource Lab, Penn State University.

The Center also welcomes Sue Oram, the Chapter's new Administrator. If you have any questions or comments regarding membership management, website administration, the PA-TACF newsletter, or contact referral information, please contact Sue.

Both Sue and Sara Fitzsimmons may be reached at one of two phone numbers set up for the Leffel Center:

814-863-7192 or 814-863-3600

Also, e-mail Sue at: sko2@psu.edu

Calendar of Events:

- Spring Growers Meeting, March 18, Hershey, PA
- TACF Board and Cabinet Meeting, April 1
- Planting of American and Hybrid Nuts, April and May
- Pollination Time, June
- Volunteering at Meadowview Farm, VA, June
- Ag Progress Days, August 15-17
- Harvest Time, September
- TACF Board and Cabinet Meetings, October 19-20
- TACF Annual Meeting, Abingdon VA, October 20-22

Directions to Spring Meeting:

1. From US 322, turn onto Meadow Lane
2. Continue on Meadow Lane to for 1/2 mile to Crest Lane
3. Turn right to the Environmental Center

CHESTNUT PASSION - by Zhuxuan You

Zhuxuan ready to pollinate in Beaver County with PA-TACF volunteer Dan Cain.

When I was in China, I was always inclined to purchase some chestnuts every October when the aroma of roasted chestnut rose in the air. The unique sweetness of the nut is so unforgettable that it still affects my taste. After being away from home for about four years, the chestnut came back into my life this summer.

My summer internship with the Pennsylvania Chapter of the American Chestnut Foundation (PA-TACF) gave me an opportunity to learn more about the chestnut and chestnut people. I was shocked by the tragedy caused by the chestnut blight. The most impressive, however, is people's passion with chestnut.

On July 5, 2005, I went to Warren County with Sara. The weather was bad due to hurricane Dennis. As a result, we had to bag a tree in a thunderstorm. The owner of the tree was Kelly Ferrie. Although he is not a member of PA-TACF, he allowed us to use his tree for bagging and pollination. In his words, "it is good to see someone protecting the tree". Is this tree so important? Actually, I kept asking people this question the entire summer. Finally, I found the answer in his backyard. While we were bagging, Kelly's wife Linda took many pictures. She explained that she wanted to show them to Kelly's father, because he had worked as a lumberjack and witnessed the prosperity and poverty of the American chestnut.

He has been hoping the American chestnut would recover from its blight for a long time. While we were talking about him, Kelly picked his father up from his home, in the downpour of rain. Mr. Ferrie is 82 years old. He sat in the car and stared at us silently. On his face was apparent excitement. In his eyes was aspiration. Just at that moment, I understood why the chestnut people work so hard, why so many volunteers devote their own time, money and efforts to this objective – the restoration of the American chestnut. It is this desire that encourages people to adopt this activity. It is this expectation that stimulates people to realize their social respon-

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President's Corner

Getting the Work Done

-Tim Phelps

The arrival of snow indicates winter is here, and the tolling of the midnight New Year's bell is sort of like hitting a reset button in this business. Spring will soon arrive. Nuts will be planted. Seedlings will grow. Flowers will be pollinated. Trees will be inoculated and selected for resistance. Nuts will be harvested and processed for storage until the next year when the cycle will begin anew. Each year we learn from our mistakes, and, collectively, we get better and better at improving the process of healing a crippled species.

The series of events seem simple enough, but it's often the events in between that give us the most problems. Spring will arrive, but is there a site ready to plant, or did the seed survive storage? Nuts will be planted, but will they be safe from predation? Seedlings will grow, but will they survive a drought, or will deer eat them first? Flowers will be pollinated, but will the timing be right, or will there be enough female flowers? Trees will be inoculated, but will any make the cut? Nuts will only be harvested if we've had good pollinations and good growing conditions.

Despite the conditions that Mother Nature presents us with, one part of the process that we can control is getting the work done. Volunteers from the around the state, and neighboring states, have put in countless hours assisting orchard managers, giving presentations, serving on the board and/or committees, and by simply spreading the mission of restoring the American chestnut. **Volunteers are the backbone of this organization!** The work would not get done without them. Many members put in several hours each year in volunteer work for the organization and find it very rewarding. As the number of trees in the ground continues to increase, so does demand for assistance in caring for them. Please consider helping out this year by calling the Leffel Center (814-863-7192) and finding out where help is most needed.

HAPPY NEW YEAR!

Tim Phelps, PA-TACF President
Phone: 814-865-7228
Email: phelpst@psu.edu

- *Sara Fitzsimmons*

BREEDING PROGRAM UPDATE

For this February update, I'd like to give a general overview of the 2005 season. We had some great firsts encountered in our breeding.

Planting and Growing: Although much of the state experienced a relatively dry season, we did not lose too much in the way of growth. Germination and seedling take at our new orchards was relatively good, if not a bit on the low side. Numbers are still coming in from some of the new orchards, but Table I shows a breakdown of newly planted seeds/seedlings for the 2005 growing season.

Orchard Type	Seed/Seedlings Planted
American	218
BC2	47
BC3	846
BC3F2	1750
CMS B1	205
CMS F1	749
Grand Total	3815

Table I. A summary of PA-TACF plantings in 2005.

A standardization of fertilization did help growth at many or-

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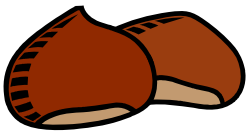
do you have an e-mail address??



Do you want to keep up on the **latest in all things chestnuts**? Do you have question about chestnut culture and growing, chestnut or blight history, or just about anything else?

Then sign up for our e-mail lists. Sponsored by Penn State University Listserv Servers, there are two opportunities for PA-TACF members to contact many chestnut professionals and experienced volunteers with a simple e-mail message.

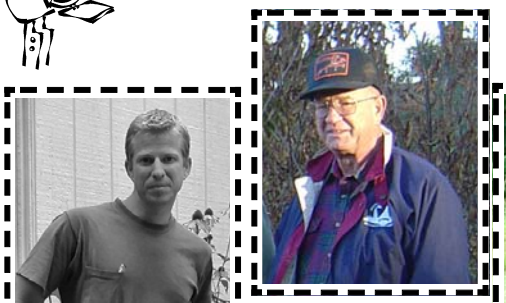
First—the TACF Growers List is an open forum for discussion on all subjects related to the growing of chestnut trees.

Second —PA-TACF List is a forum for announcements and discussion on all subjects related to the Pennsylvania Chapter of The American Chestnut Foundation. The list is private and only accessible to members of the Pennsylvania Chapter of the American Chestnut Foundation.

To join both lists, simply visit the following website for instructions and more information:

http://chestnut.cas.psu.edu/mailinglist.htm

Volunteer Spotlight



Dylan Jenkins — Chandis Klinger — Alan Tumblin

Our Newest Elected Board Members

In this installment of our Volunteer Spotlight, we here at *The Chestnut Tree* would like to focus on the chapter's newly elected Board members, each of whom are pictured above. 43% of the election ballots were returned — the Chapter thanks all of our members who took the time to help us elect these board members.

Dylan Jenkins is the regional forester for The Nature Conservancy. Through his efforts, PA-TACF has formed a great bond with TNC. With the help of great volunteers from the Conservancy, the Chapter worked to establish a new Graves source BC3 orchard on TNC's West Branch Wilderness property near Hyner State Park in the spring of 2005.

Chandis Klinger joins us for a second term as Board Member for the Chapter. Chandis has been involved with TACF since 1988, after finding several native chestnut sprouts on his property in Middleburg. Chandis has been making controlled pollinations of advanced hybrid material for the Chapter since its inception in 1995.

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THANKS!!!!

And, as a special insert to our Volunteer Spotlight, the Chapter would like to extend it's thanks to member **John Scheafnocker** from Mercer County for making a donation of almost 1000 Steuwe D40 pots and collars. We use these pots almost exclusively for our seedlings production and this donation will allow us to more effectively use chestnut seedlings in our breeding efforts.

Thanks go as well to **Gary Micsky** of the Mercer County Cooperative Extension for delivering the pots and trays to our facilities here at PSU.

FIELD TRIP! *THE GRAVES TREE*

- Sara Fitzsimmons

In mid-November of 2005, I had the pleasure of visiting the Connecticut Chapter and presenting at their Annual Meeting. Being sponsored by Yale, most specifically the School of Forestry and Environmental Resources, the meeting was held in New Haven, CT.

As some of you already know, the longest ongoing breeding program for chestnuts has been in Connecticut, and has occurred within very close proximity to New Haven. Much of the chestnut land cared for by the Connecticut Agricultural Experiment Station (CAES) is within a bur's throw of New Haven.

So on my trip out of town after the meeting, and with the help of a map drawn my Fred Hebard, I set out to Sleeping Giant State Park to take in a little bit of chestnut breeding history.

Taking Interstate 90 from New Haven to Hamden, a driver can get a great look at the Sleeping Giant Mountain (If you haven't, I recommend looking up the story of Sleeping Giant). On your way into the research plots, you pass Quinnipiac College, the State Park, and head on about a mile to, what else? **Chestnut Lane**.

As you turn onto Chestnut Lane, the South Lot will be on your right. Continue further up Chestnut Lane, and you'll see the West Lot on your left. Many of the trees in these lots were crosses started by Arthur H. Graves, who started his chestnut breeding work in 1930. He owned the land just off of Sleeping Giant State Park until he donated it and the trees to the state – both of which have since been in the care of the CAES.

If you visit these sites, you'll see many various types of hybrids, many of which have either no blight or healing/healed cankers. There are Japanese crosses, European crosses, Chinese trees, even a cross of an Ozark chinkapin to a Chinese chestnut. What's most intriguing about an on site visit is that some have the crosses labeled; but many just have a position tag on them.

Graves wrote extensively about his breeding work with chestnuts [1]. He was a professor at the Yale School of Forestry and, from 1921 – 1947, he was the curator for the Brooklyn Botanic Garden. Although Graves and his students created a remarkable amount of chestnut hybrids, many of which are still being used for breeding in the CAES breeding program, his most well-known contribution to the TACF breeding program is the "Graves" tree.

After the Clapper source, the Graves source of resistance is the most advanced in our breeding program. The Graves tree is a

BC1 hybrid, derived from the described Mahogany Chinese tree, and can be found toward the back of the West Lot. Mahogany is also the Chinese tree on which much of the genetic mapping work for Chinese resistance has been made. A Mahogany Chinese tree may be found in the South Lot.

I think it would be well worth any chestnut enthusiast's time to stop off at these sites and take a walk down Chestnut Lane. Note, too, that there is a trail, the Quinnipiac Trail, that runs right through the Chestnut orchard (you can get a trail map at the State Park on your way into the site). The hike is a very easy and basic one, more of a stroll, really, and makes for a very pleasant time in the outdoors.

I thank the CAES for doing a phenomenal job in the preservation of this material and the Connecticut Chapter of TACF for giving me the opportunity to be in the area to visit these landmarks.

For an up-to-date summary on the chestnut breeding work at CAES, see: **http://www.caes.state.ct.us/FactSheetFiles/PlantPathology/fspp085f.htm**

[1] You can find a reprint of one of his articles in the Autumn 1998, 12.1 issue of the TACF Journal. It's available for download here: http://www.acf.org/Journal.htm

Reed Run Orchard
-*Tim Eck*

The Reed Run Orchard is a CMS breeding orchard featuring a unique cooperation of PA-TACF (www.patacf.org), The Lancaster County Conservancy (www.lancasterconservancy.org), and Alcoa Mill Products – Lancaster (www.alcoa.com/locations/usa_lancaster/en/home.asp). It is situated on a recently acquired Conservancy property in the river hills of southern Lancaster County, accessible from House Rock Road.

From the initial planting in April of 2004, Alcoa has supported the orchard through its volunteers – about 40 employees, friends and family - and its $3000 ACTION grants to PA-TACF.

Although the initial planting site was certified chestnut free by three seasoned experts, before the initial planting of about 90 seeds was complete, we noticed that several Chinese chestnut trees had crept up to within thirty feet of the site. Hoping to preserve some dignity and later convince the neighbor to cut his trees, we continued with the planting. Otherwise the planting was ideal - the day was bright and sunny and we received excellent coverage in the Lancaster Sunday News and even a spot on local TV.

As the year progressed, it became obvious we needed to move the orchard and also institute some deer control measures – all my largest trees were flush with the tops of the tree tubes. Since I also wanted to increase the number of resistance lines, I lined up some more AxC crosses and another work crew from Alcoa and requested another $3000 ACTION grant to buy fencing. Barry Campbell, the neighbor with the Chinese trees, helped me lay out the orchard perimeter fence on Conservancy land about a half mile away. And a lucky thing we did this early - on the scheduled work day, April 23, 2005, the visibility was about 50 feet. Nonetheless, about 25 people found their way to the site. This time we had more than enough work for all – we laid out a 380 tree orchard, planted about 200 trees, and put up 900 feet of fencing. The next day, Barry Campbell, Steve Baumann, and I transplanted the sixty surviving trees from the 2004 orchard.

My wife, Livy, and I have been doing most of the orchard maintenance, but we hope to get some of the Alcoa volunteers to help next year.

"Gorillas in the mist" - Dave Armstrong and Tim Eck at Reed Run transplantation and seedling planting, 2005

Thank you to the following Alcoa volunteers and friends for your help at Reed Run:

Steve Baumann / Mike Beaudet / Keith Clayton / Tim Eck / John Eye / Pete Frailey / Mario Gallello / Roy Hambric / Butch Johns / Ray Keck / Dave Keen / Marcia Limbert / Frank Lynn / Mike Liu / John Main / Brad Morgan / Glen Rottmund / Dale Russel / Leslie Schlegelmilch / Scott Shaub / Donna Welsh / Kevin Wozniak / Rick Zook.

Writers Wanted!

Don't forget to announce your volunteer activity in your local paper or send in an article about the terrific things PA-TACF is doing right in your neighborhood.

We here at the Leffel Chestnut Center can help you with local paper contacts, general chestnut facts and/or pictures for your article.

Be sure to mention the PA-TACF website (http://www.patacf.org) and give contact information for the Chapter as that for the Leffel Center. And when you get published, let us know! Just send a copy of the article to the Leffel Center.

Our contact information may be found at the top of the front page of this newsletter.

A Brief Summary of Chestnut Canker Biocontrol

-Timothy McKechnie

Most people in TACF are familiar with three forms of biocontrol: viral hypovirulence (hypovirulence means "lowered virulence"), genetically engineered hypovirulence, and mudpacking. This article briefly summarizes what is known about each type, with an emphasis on what is currently practical for preservation of individual trees, for example preservation of mother trees for breeding purposes.

HYPOVIRULENCE

Using viral (natural) forms of hypovirulence, Dr. Sandra Anagnostakis of the Connecticut Agricultural Experiment Station has demonstrated some degree of success with viral (CHV-1) hypovirulence on populations of American chestnut in a forest setting, as measured by more living sprouts per clump and larger stem sizes. The orchard plot of mixed hybrids and American chestnuts at Lockwood Farm has also has been a successful use of CHV-1 hypovirulence.

In practice, biocontrol using hypovirulence depends critically on the use of appropriate vegetative compatibility (VC) groups which closely match the compatibility group(s) of the targeted canker(s). It's impossible to know what VC group is infecting any given tree without lab tests, so random application of any old strain may fail – over 120 vc types are known!

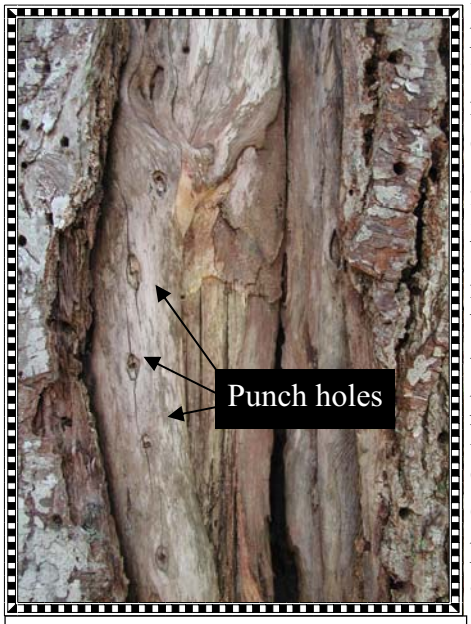

Figure 1. Healed canker treated with hypovirulence on an American chestnut tree at Harkness Preserve in Camden, ME. Trees are now approaching 25" dbh. Picture S. Fitzsimmons, 2003.

Not only does hypovirulence suffer from the problem of matching local compatibility groups, but it can be lots of work. The best application method appears to be direct inoculation in a series of punched or drilled holes around the circumference of each canker. Hypovirulent strain(s) are applied to the holes either as mycelial plugs or as a slurry of conidia and mycelium. Preparing the holes, of course, is labor intensive not to mention dangerous when cankers are high up on a tree.

Genetically engineered hypovirulence involves use of *C. parasitica* strains containing portions of the viral genetic code integrated into the fungal nucleus. Such projects require a permit from the federal government, and so are beyond the reach of the general public.

MUDPACKING

Mudpacking does work on an individual tree basis, given a tree healthy enough to heal itself and given the procedure is done properly and in time (Figure 2). VC groups are obviously not a factor with mudpacking, but one does need to continually apply mudpacks to new cankers.

Figure 2. Succession of mudpacking process at Lasdon Arboretum orchard, a New York Chapter orchard in West Chester, NY taken care of by TACF-NY volunteer Craig Hibben. A) Chiseled canker; B) mudpacked canker using garbage bag and chicken wire; C) healed canker after mudpack was removed. Pictures S. Fitzsimmons, 2005.

Various methods of mudpacking have been reported. Many prefer to use soil collected from the base of the tree. One moistens the soil enough to make it sticky, applies a half-inch-thick layer to the canker, then wraps it with 4" wide "shrink wrap" from a building supplier. Other people have wrapped trees with burlap bags, duct tape, plastic pipe, coffee cans, etc. Wrapping mudpacks can be very time-consuming, especially when dealing with a canker near multiple branches. I've found that spray painting is far more convenient. Auto body undercoating provides a tough, durable coating in a fraction of the time. Latex paint works nearly as well, and can be applied with a cheap trigger sprayer.

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I protect individual trees by cutting out the entire infected area with a hatchet or chisel (no need to use sterile technique) and apply a poultice composed of a sticky combination of dirt, sawdust, and carpenter's glue. Then I spray paint the poultice with ordinary latex paint. It lasts for a couple of years. Without evidence of any sort, I imagine the best "dirt" is the rich humus from around the base of trees, which ought to be full of bark-decay and/or antagonistic microbes.

The MA chapter has been using mud fortified with *Bacillus megaterium* (they call it "Magic Mud") which is applied to infected bark by merely brushing on the wet muddy slurry[1]. The applied mud is left to dry without wrapping of any kind. The idea is to inoculate the bark with biocontrol organisms. It's not clear why mudpacking works, with or without *B. megaterium.*

Many TACF members will remember the association of antagonistic Trichoderma fungus with mudpacking, although this is a line of inquiry which has not been pursued. Parenthetically, it's possible that *C. parasitica* is such a good pathogen of chestnut because it suppresses tree defense reactions.

FUNGICIDES

Are there any other options to prolong the flowering stage of mother trees. Readers of the TACF Journal will be familiar with Dr. Terry Tattar's[3] recent article on restricted-use fungicides (which are only available to certified applicators), but this is probably not a practical approach for the general public. As far as I know, there is no restricted-use fungicide approved for use on chestnut - it was necessary for Dr. Tattar to obtain experimental use permits for each fungicide. Also, the Mauget injectors he uses are not available to the general public. Also as far as I know, there's no non-restricted-use fungicide that works reliably.

I've heard of the use of various poultices including eggs and fresh grass extracts. I've heard that merely removing cankers with a hatchet works pretty well, without any mudpacking or poultice, but I haven't tried it. Mild soil fertilization may help. Probably any step that improves general tree health, may serve to prolong the useful life of mother trees.

[1] Summer/Fall 2001 (15.1) issue of the Journal of TACF.
[2] Spring 2004 issue (18.1). http://www.acf.org/journal.htm
[3] Editor's note: Be sure to read all label restrictions on any herbicides, pesticides, and fungicides before using them. Especially for fungicides, many are not labeled for use on chestnuts.

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chards. At the Spring Growers meeting, we will be handing out soil testing kits from Penn State University to help facilitate more specialized regimes for each orchard.

Pollinations and Harvest for 2005: Despite the droughty conditions, we had a relatively good harvest this fall. We did lose some controlled pollinations to both contamination and, to my suspicion, drought, but we still have plenty to keep our volunteers busy in the spring. Table II shows our final harvest tallies by seed type. Thanks again to all of our wonderful volunteers for taking on the effort of making controlled pollinations. I hope to have you all back for the 2006 efforts!!

Seed Type	Number Harvested
BC3F2	825
Clapper BCx	199
Graves BCx	340
Douglas BC2	194
F1	451
American	10,500
Chinese	1500
TOTAL	14,009

Table II. Summary of 2006 PA-TACF Harvest

Inoculations: As reported in the fall issue of this publication, the summer of 2006 brought about the inoculation of two PA-TACF orchard. At the PSU Arboretum, we inoculated about 250 BC3F2 trees. In November, Chapter President Tim Phelps and I rated the resistance of those trees. Among four families planted, we kept approximately 15% of the trees. Final selections will be made in May of 2006.

At Tom Pugel's Clapper BC3 orchard at Riegelsville, we inoculated 84 trees or 46% of the stock originally planted at the site in 2000. Table III shows the preliminary ratings for the site. Final selections will be made in May from which we should be able to produce a new line of Clapper BC3F2s to plant at the PSU Arboretum next spring. Figure 1 (page 8) shows where our inoculation activities should be taking place in 2006.

(*continued on page 8)*

Table III. Riegelsville Ratings. Scale: 1=highly resistant, 5 = highly susceptible.

	Preliminary RATINGS Number of Trees / Rating. (11/11/2005)				
Seed Type	**1**	**2**	**3**	**4**	**5**
American			1	1	
Chinese	1	3			
F1		1	2		
BC3 (WV419)		5	16	6	1
BC3 (BE325)			19	25	3

Pennsylvania Chapter
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The Chestnut Tree Newsletter

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sibility and persist in this long journey. Restoration of the American chestnut not only introduces a tree back to the eastern ecosystem, but advocates a kind of passion back into society.

I heard many different stories related to the American chestnut this summer. All of them are full of the sentimental feelings people have accumulated for generations. American chestnut, as a medium, unites people like a knot to fight with nature. I believe that with this organization and enthusiasm, the goal will be accomplished.

I am very proud to have been a part of this effort. As a foreigner, I applaud you for it.

(Continued from page 3)

Alan Tumblin works for Ames True Temper. He put in a new CMS orchard in Cumberland County this spring. He's been assisting in pollinations for the past two years and as such is already a well-seasoned volunteer.

We welcome our newest additions to our already stellar line-up of Board members: **Tim Phelps** of State College (President), **Dave Armstrong** of Hanover (Vice-President), **Alex Day** of Spring Mills (DCNR Representative), **Timothy Eck** of Lancaster (Treasurer), **Jim Egenrieder** of Harrisburg, **Bill Montague** of Liberty, **Bob Summersgill** of Warren, New Jersey (Past President), and **Jim Walizer** of Bellefonte.

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Call to Action!

There will be a lot to do this upcoming summer, including inoculation at a scheduled ten locations around the state. More than likely, there will be an event near you! And we could always us your help. Be sure to stay tuned to the PA-TACF mailing list for the latest on scheduling of these and other events (see page 3). Or just contact me at the Leffel Center at any time!

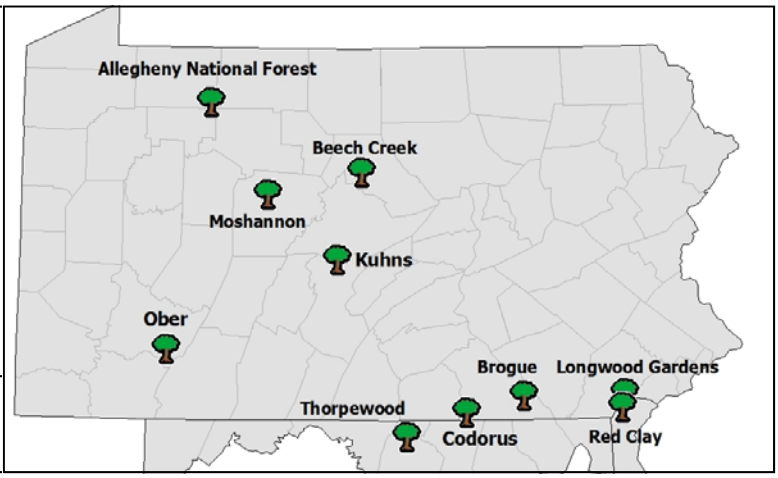

Figure 1. Locations for orchards where inoculation activities are tentatively scheduled for the early summer of 2006.