

News from the Connecticut Chapter of The American Chestnut Foundation

Spring 2009

the New Leaf

Our mission is restoration of the American chestnut in the State of Connecticut

drawing courtesy of
Dr. Fred Paillet



Capturing Connecticut's American chestnut Genes

Gayle Kida - Suffield, CT

Although there are currently thousands of small native American chestnut (*Castanea dentata*) sprouts in the understory of Connecticut's forests, only a rare few escape or survive blight long enough to grow to flowering size. Fewer still are located in or next to a clearing or canopy opening to receive sufficient sunshine to initiate flowers. Most often, a flowering tree has been invaded by blight and is heavily cankered; it will die back to the roots within one to a few years after producing its first flowers



Above - (1/6 in series) A flowering twig tip with catkins a few days before pre-bagging the female flowers. One female is visible at upper right at the base of the topmost catkin, a bisexual catkin. Trees in the shade seldom flower. (Photo courtesy of Gayle Kida)

website www.ctacf.org

pollination

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See annotated photos on the web-site!

Below - (2/6 in series) Flowers at pre-bagging time. The four females (one is a double) vary in size and development. Ideally the flowers are pre-bagged to protect them from undesired pollination before they become fertile. (Photo courtesy of Gayle Kida)



and burs. Without another flowering American tree nearby to pollinate it, the attempt to produce nuts will result in either infertile flattened husks or fertiles fathered by pollen from Chinese or other hybrid chestnuts. Japanese, Chinese and European chestnut cultivars were sold by many mail order sources to Connecticut residents going back more than a century, and hybrid replacements for dying American trees were tested and promoted to farmers and homeowners by the CT Agricultural Experiment Station beginning in the early 1930s.¹

The American chestnut sprouts you come across in the woods may look like seedlings, but they are probably quite old. It has been suggested that more than 95% of stump sprouts in Connecticut are actually *old seedlings*, small trees established just before blight appeared in the state around

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Capturing Connecticut's American chestnut genes ...
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1910 –1925.² The sprouts you see are the latest attempts from surviving roots to form new trees, over many decades sprouts have re-emerged when above-ground stems became blighted and died back. Because these trees rarely sexually reproduce with another American, there can be no new pure species genetic recombination that may help our native chestnuts adapt to a changing environment.

Therefore each tree that successfully flowers is a temporary event, a window of opportunity to capture some of Connecticut's genetic diversity. A chestnut native to Litchfield County is likely to have different alleles (alternative forms of a gene) than a tree in Essex County.³ Through controlled pollinations, CT-TACF seeks



Above - (3/6 in series) Before pre-bagging, all of the tip's male catkins and the male part of the bisexual catkins are trimmed off, removing or trimming back leaves that would take up room in the bag or get in the way of securing it. A finished pollination bag is fastened with a twist tie in the background of the photo. (Photo courtesy of Gayle Kida)

Below - (4/6 in series) Females 10-14 days after pre-bagging are usually ready for pollination. The styles, structures connecting the receptive stigmas to ovules, have turned very pale yellow. The tree's remaining male catkins are bushy. Bisexual catkins are still in bud but ready to open. (Photo courtesy of Gayle Kida)



to create twenty or more lines using our state **mother trees**. The goal is to intercross CT lines of backcross trees that are on average 15/16 American but containing a small amount of Chinese material including blight resistance genes⁴. It is worth considering that the Chinese **cousin** species whose genes bring disease resistance already shares genes with the American species because they both evolved from a common ancestor many millions of years ago.⁵

Performing controlled pollinations requires dedicated observation of the tree's flowers because weather conditions and temperature can speed up or slow development.⁶ The female flowers are predominantly on the highest branches of the tree, where they are most exposed to windblown pollen from another tree. Binoculars are often needed to view the flowers to gauge their readiness. Timing is crucial; a couple days too early or too

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late may greatly change the degree of unwanted pollen contamination or the final success of the harvest. Volunteers who help pollinate, work with bucket truck operators, or use ladders to access the flowers. The photos appearing with this article give a close-up view of controlled pollination, and show how the flowers may look at each stage.

Want to learn more about pollinating chestnut? There are annotated photos on the web-site. Search the web-site using the keyword "pollination."

website www.ctacf.org

pollination

Search



Above - (5/6 in series) One container that can be used to perform a controlled pollination. Only the very tips – ends – of the styles have the receptive stigmas. A small quantity of pollen is tapped into the depressed area of the lid, and the female flower is gently dunked, tilted and swirled so the stigmas get coated with pollen. But there are other more time-tested methods. The most established method involves dragging the stigmas through a film of pollen coating a glass slide, but some prefer to use a prescription lid, dunking the style tips into a pile of pollen. After controlled pollination the flowers are re-bagged to protect them from undesired pollen. (Photo courtesy of Gayle Kida)

Below - (6/6 in series) This large cluster of burs actually came out of a pollination bag. Many plump fertile nuts are visible, showing the characteristic white pubescence (fine hairs) covering a large portion of the nut.. (Photo courtesy of Gayle Kida)



REFERENCES

1 "An Historical Reference for Chestnut Introductions into North America" by Dr. Sandra L. Anagnostakis, document is online at: <http://www.ct.gov/CAES/cwp/view.asp?a=2815&q=376740>

2 "Chestnut: history and ecology of a transformed species" by Frederick L. Paillet, *Journal of Biogeography* 29, pgs. 1524-1525. A pdf document is online at: http://harvardforest.fas.harvard.edu/publications/pdfs/Paillet_JBiogeography_2002.pdf

3 "An Update of Chestnut DNA Projects: Part II" by Paul H. Sisco, *Journal of the American Chestnut Foundation* Vol. XX, no. 2 (Fall 2006), pgs. 40-42. A PDF of this issue of the *Journal* is available online at: <http://www.acf.org/pdfs/resources/journal/JrnlFall2006.pdf>

4 The Backcross Method, web page from the American Chestnut Foundation website, http://www.acf.org/r_r.php

5 "Intercontinental genetic divergence of *Castanea* species in eastern Asia and eastern North America" by F. Dane, P. Lang, H. Huang and Y. Fu, *Heredity* (2003) 91, pgs. 317-318. A pdf is online at: <http://www.nature.com/hdy/journal/v91/n3/full/6800300a.html>

6 Per Dr. Fred Hebard, personal e-mail communication, 2005

A Canaan Mountain Legacy Renewed: Chestnuts and Community

Ellery "Woods" Sinclair - Falls Village, CT

For those members who might not be aware, Canaan Mountain's Great Mountain Forest in Connecticut's Northwest Corner was an active participant in the USDA cooperative evaluation of Chestnut survivability under forest conditions. Fifteen test plots were established by Dr. Jesse D. Diller of the USDA, with Great Mountain Forest — a forestry laboratory founded in the early 20th century by the Childs family — established as Site #1 and planted in 1947. The trees for these plots originated from the USDA Glenn Dale Nursery and from the CT Agricultural Experiment Station. Trees were monitored annually until 1963 and then again in 1978. Some of those specimens grown under their stewardship still exist in old, now abandoned groves on Canaan Mountain. An early hybrid, planted years ago behind our barn, produces a gross of nuts each season. These delectable morsels complete our family's holiday table — if I harvest each fall before squirrels and now black bear.

This October on behalf of the Connecticut TACF Chapter and the Berk-

Below - Student Volunteers from the Housatonic Valley Regional High School - built this kiosk to explain the story of the American chestnut, and research orchard.

(photo courtesy of Mary Lu Sinclair)



shire-Litchfield Environmental Council, I conducted a tour and presentation at the Great Mountain Forest orchard. Each year the Housatonic Heritage Walks, co-sponsored by the National Park Service, organizes area programs - a variety of hikes and presentations in the Upper Housatonic Valley National Heritage Area. This orchard event's success was indicated by attendance from as distant as fifty miles, in addition to local participants and press coverage.

Using photographs and a dried branch with burrs and catkins, I attempted to demonstrate the techniques of bagging and selective pollination. The many questions asked of Kendra and me were varied and showed considerable interest in the Foundation's efforts to re-establish the American chestnut to our forests. Mary Lu, my wife, brought apple cider (sweet not hard) and chestnut cookies — made from the nuts behind our barn — to reward the folks at the site afterwards.

Again this spring as in 2007, horticulture students from the Housatonic Valley Regional High School Agricultural Science and Technology Department laid out and planted the orchard with another 120 back-cross nuts along with 30 seedlings. This fall another group of students from the Ag Sc/Tech Dept. designed and constructed, as a class-room and on-site project, a very handsome orchard/chestnut information kiosk with lumber donated by the Falls Village Saw Mill. The kiosk features a large illustrative CT-TACF poster, a box containing brochures, and information and news items, along with a notebook for visitor comments.



Above - Dr. Jesse D. Diller and Russell B. Clapper at the Robbins Pitch Plot at Great Mountain Forest (USDA Site 1) Sept 1963. (photo courtesy of GMFC Archives)

This past summer, the chapter — enabled by a special grant — contracted Scott Jenkins to design and construct — with his son — an eight-foot-high solar panel-powered electric fence to protect the young trees from white tail deer predation. The fence is a success; the heavily-feathered wild turkeys, however, are not deterred. Also for this summer, our Chapter had approved funds, and subsequently solicited a special donation, for a high school student, part-time intern to assist with weeding, watering, mulching, and general maintenance — a great help, particularly with transplanting for the fence installation. I sincerely trust this worthwhile internship program will be continued, especially as the orchard becomes larger, perhaps with space for another 300 plantings. The summer intern, Doug Palmer, a graduate now attending forestry school, thoroughly enjoyed the work, received a head start in his college program through this on site experience; he regretted, however, he couldn't provide more time from his forestry work at GMF.

On a cold, wet early November day, Gayle Kida and I took inventory of surviving plantings (about 70%) and heights (from 3 inches to 41 inches — note varied growth over two years'

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*A Canaan Mountain Legacy ...
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plantings). With plenty of rain this summer, the orchard has done well, and light mulching around each tube has helped retard weed and grass growth. Next spring: more transplanting to facilitate mowing with accommodating the fence and perhaps more plantings; now we're ready for winter.

An Addendum (a bit more history): Resulting from local publicity about this fall's orchard walk, I received a note from a long-time friend, Norm Sills, regarding his working in 1939 or 40 for Dr. Graves on his property in Hamden which he had turned into an experimental chestnut plantation — now owned, Norm thinks, by the CT Agricultural Experiment Station, [sic, apparently 9 acres]. He recalls that one of his jobs — for \$10 a week — was tying paper bags on the trees to control pollination, crossing American chestnut trees with all sorts of foreign species in hopes of developing a disease-resistant strain. Norm writes: "One tree of which (Dr. Graves) was very proud he called the Great I Am, and I often have wondered what became of it. Died, most likely."

And the work continues!

Below - Housatonic Heritage Walks attendees meet with Connecticut Chapter Director Ellery "Woods" Sinclair (grey hat on right) discuss the care of the back-cross seedlings at GMFC / TACF research orchard (photo courtesy of Mary Lu Sinclair)



Above - Lincoln Foster of the Great Mountain Forest and Dr. Arthur H. Graves at the Robbins Pitch Plot May 1948 (photo courtesy of GMFC Archives)

TACF and Great Mountain Forest Corporation are developing an introspective of the Chestnut Research at Great Mountain Forest. If you have relevant photos or stories, we'd like to hear from you!

Want to learn more about Great Mountain Forest? Visit the Chapter web-site and use the search term "great mountain."

website www.ctacf.org

great mountain Search

My Turn

Bill Adamsen, CT Chapter President

The Annual Meeting on March 14th features an excellent program with Prof. Fenny Dane as our keynote speaker, and excellent presentations by TACF Science Coordinators Sara Fitzsimmons and Kendra Gurney. We look forward to seeing you there. Program is free, as is lunch with R.S.V.P.

This issue has been an enjoyable read. I loved Gayle Kida's pollination photos and enjoyed Ellery Sinclair's article on Great Mountain Forest. Seeing photos from the archives is a treat - especially Diller and Clapper - since a first back-cross chestnut named after Clapper is the source of resistance for our fourth generation CT trees. I was also intrigued because Lincoln Foster shown in the photo at left with Dr. Graves was a friend of my father. Foster was renowned as "father of the American Rock Garden," small world!

As we enter 2009 and take stock, I can report once again that we're tracking closely the Chapter's goals in our Strategic Plan. The CT program may lag a few years behind TACF Meadowview, and our nearby chapters in Pennsylvania and Massachusetts — but that lag also presents opportunities in terms of experience gained, better technology, and the leveraging of new knowledge. A few years in a breeding program is almost insignificant, and we are racing to the finish line together with the promise of species restoration.

Our next big challenge will be in creating our seed orchard in CT. Needed will be land, and money. If this is an area you'd like to help, please contact me. As a volunteer run organization, your donation goes far. CT-TACF is a tax exempt, 501(c)(3) public charity under 509(a)1, section 170.

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website www.ctacf.org

strategic vision Search

Appalachian Trail Mini Transect

Bill Adamsen - Wilton, CT

This past September while hiking the Appalachian trail along the CT/MA border, I looked up and saw a spreading canopy of chestnut leaves - a hundred years ago this would have been a common experience most anywhere in New England. Today this unusual though not unknown treat awaits those with opportunity and the skill to recognize when it happens.

On my hike I encountered an AT conservation maintenance unit - teenagers and their leader. We got talking and realizing I would pass them again on my way out, I plotted a little discussion on trees. Three different leaf samples: Chestnut Oak, American beech and American chestnut provided the talking points. Thought was, that should I prove entertaining, they might pay attention long enough

Below - my daughter holds out an American chestnut branch for closer inspection along the Appalachian Trail (photo courtesy of Bill Adamsen)



Above - Canopy of American chestnut along the Appalachian Trail (photo courtesy of Bill Adamsen)

to compare and contrast the leaves, and start a conversation about chestnuts and ecology. I had my secret weapon - a goofy golden retriever happy for attention.

My expectations were exceeded - these kids and their leader were more than up to the discussion (a sultry 85 degrees, they welcomed the break)

and were thrilled to learn about the chestnut and that they were working in close proximity to so many remaining sprouts. One of them even knew that the three samples came from the same family - fagaceae. I left and we thanked each other for the pleasure of a chat.

The next weekend my entire family joined me for hike along the Appalachian trail. We had picked a day hike along the trail earlier in the summer and hiked up to Rands View in the Falls Village area. I had been disappointed not to see any chestnut. With my family we climbed Mt. Race as part of the trip, camping along the Appalachian Trail. What a thrill - there were chestnut everywhere!

Northeast Utilities Helps Support Restoring the American Chestnut

Bill Adamsen - Wilton, CT

Northeast Utilities' paper reduction program has once again made The American Chestnut Foundation beneficiary of a shareholder "challenge" grant opportunity. Northeast Utilities, with 50,000 registered shareholders, raised \$8500 in 2008 for TACF and the CT Chapter by making a \$5 donation for each shareholder that agreed to receive the Annual Report in an electronic format. We are fortunate to benefit from Northeast Utilities' vision.

This is a wonderful opportunity to promote the revival of a great American tree while also providing greater convenience for our shareholders," Charles W. Shivery, NU Chairman, President, and Chief Executive Officer.

Below - Northeast Utilities VP Jeff Kotkin hands check to TACF CEO Marshal Case during a summer celebration at the new Guilford Orchard. Shown from left TACF Director Bill Adamsen, former Regional Coordinator Leila Pinchot, Marshal Case, Jeff Kotkin, and also representing Northeast Utilities - Susan Stotts and Pat McCullough. The event was a celebration and appreciation of Leila Pinchot's two years with TACF. Leila has returned to Tennessee to work on her PhD with Chestnuts. (photo courtesy Al Lara)



Guilford Chosen for Spring Annual Meeting

Please mark *Saturday March 14th* on your calendar for our Annual Meeting! The program is free, as is lunch (with advance registration). So call or e-mail now to reserve! **917.796.4284**
bill.adamsen@gmail.com

Agenda

9:30am	Opening Reception
10:00am	Introduction - Chapter President Bill Adamsen
10:15am	Keynote - Dr. Fenny Dane - Evolutionary history of American Castanea species
11:15am	Sara Fitzsimmons - TACF Goes to China
12:00pm	Lunch
1:00pm	Kendra Gurney - TACF Strategic / Operational Updates
1:30pm	Chapter Business (Bylaws, Elections, and then close of Annual Meeting)
2:00pm	CT-TACF Board Meeting - Open to All!
4:00pm	Expected close of business

About Our Keynote Speaker

Dr. Fenny Dane is a Professor of Horticulture at Auburn University in Georgia. She earned her B.S. at Wageningen in the Netherlands, her M.S. at New Mexico State University and Ph.D. at Colorado State University.



Dr. Dane's research program is geared toward unraveling stress tolerance mechanisms in plant species, and to the investigation of the phylogeny and biogeography of Castanea species. Dr. Dane discovered that chloroplast (cp) DNA sequence data set patterns were geographically structured, and has used cpDNA patterns to explain hypothesized migration and dispersion for chestnut and chinkapin.

website www.ctacf.org

Fenny Dane

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Meeting Location

Nathanael B Greene Community Center
— 32 Church Street, Guilford

Driving Directions

I-95 northbound: Take exit 58 — Keep right off the ramp and turn right onto Church Street/CT-77 southbound. Follow for .7 miles, through one traffic light. The Community Center will be on your right.

I-95 southbound: Take exit 58 — Turn left onto Church Street/CT-77 and follow for .8 miles, through one traffic light. The Community Center will be on your right.

Parking

There is parking at the community center. For directions call — 203.453.8068

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annual meeting

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Chapter Business

Proposed Bylaw Revision

The December 7, 1991 CT-TACF bylaws were reviewed and revised to reflect two major changes agreed as necessary at the Board of Director and Annual Meetings held in 2008 (see minutes of 2008 meetings on the chapter web-site) and to accomplish several goals seen as increasingly necessary to facilitate business. The changes recommended include:

- increase number of Board members
- allow flexibility in the scheduled date of the Annual Meeting
- permit conduct of business via e-mail
- allow for amendments of the bylaws

The original Bylaws, drafts of the proposed Bylaws, and explanation of the proposed changes can be found at the CT Chapter web-site.

website www.ctacf.org

bylaws

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Recommendations of the Nominating Committee

Chair Dr. Jennifer Allcock, members John Anderson and Bill Adamsen comprised the Nominating Committee. They respectfully present the following for your consideration.

Slate of Directors

A slate of members for election by the membership to the Board of Directors was agreed as follows:

- Six members whose terms expire and have agreed to be nominated for another term: Bill Adamsen, John Anderson, Gayle Kida, Will Kies, Michael McGee, Ellery Sinclair
- Three new members: Bill Moorhead, Jack Ostroff and Jane Harris.

Electing these nine (9) persons to the six existing members whose terms have yet to expire will bring the total Board membership to fifteen (15). The new Bylaws makes provision for the election of ten (10) Directors to two (2) year terms for twenty (20) total.

Slate of Officers

Presentation of a slate of Officers for election by the membership:

- President: Bill Adamsen
- Vice President: John P. Anderson
- Secretary: Dr. Philip Arnold
- Treasurer: Jim Gage

Nominating Committee

Presentation of candidates for this year's Nominating Committee for confirmation by the general membership:

- Member, Chair: Dr. Jennifer Allcock
- Member: Ellery "Woods" Sinclair
- Member: Dr. Robert Gregg

Review and approval of the Bylaws, and election of Directors, Offices, and Members of the Nominating Committee will take place at the Annual Meeting. Search the Chapter web-site for more information on the nominees including short biographies.

website www.ctacf.org

nominations

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CT-TACF Board of Directors

President: Bill Adamsen (Wilton)
Vice-Pres: Mike McGee (Tolland)
Secretary: Dr. Philip Arnold (Woodbridge)
Treasurer: Jim Gage (Ellington)
Dr. David Bingham (Salem)
Dr. Robert Gregg (Woodbridge)
Ellery Sinclair (Falls Village)
Gayle Kida (Suffield)
Garrett Smith (Avon)
Dr. Jennifer Allcock (Guilford)
John Anderson (Norfolk)
Will Kies (Greenwich)

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Annual Meeting

March 14th — in Guilford, CT — details inside on pg.7

Support from Bartlett Tree Experts Leads to Success

CT-TACF President, Bill Adamsen

Over the past several years we've been fortunate to find and pollinate a dozen American chestnut mother trees throughout Connecticut. As you may have read in our lead-in article by Gayle Kida, the process of pollination and harvest of nuts from mother trees is complex, with success dependent on accurate timing and careful execution. We are incredibly fortunate that Bartlett Tree Experts has supported our efforts by providing bucket trucks directed by highly professional skilled arborists.

Over the past few years Bartlett Tree Experts has always responded when we needed them, and we consider them a true partner in our success. Their voluntary dedication and support is truly appreciated by the Connecticut Chapter Board and Membership.

I would like to personally thank Robert Bartlett Jr. (CEO), Greg Daniels (President), Jim Ingram (Vice-President - New England Division Manager), and Charlie White (Arborist Foreman) on behalf of the entire membership of The American Chestnut Foundation, for continuing to provide such a generous level of support.

Below - Charlie White of Bartlett Tree Experts pollinates a native Connecticut American chestnut tree for The American Chestnut Foundation. Bartlett's support and high level of professionalism has been instrumental to our success in pollinating American chestnut "mother trees."

(photo courtesy of Gayle Kida)

