



# Vermont-New Hampshire Chestnut Notes

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## VT/NH CHAPTER ESTABLISHES TWO NEW ORCHARDS

Ed Toth, VT/NH TACF Treasurer

VT/NH chapter volunteers helped establish two new American chestnut backcross breeding orchards in New Hampshire and Vermont in May of 2008. On Grace and Randy Knight's High Shelter Farm in Perkinsville, VT, 27 volunteers planted 238 chestnuts with hopes that a blight-resistant orchard of American chestnuts will take hold. Most of the planted nuts came from two Vermont "mother trees": one in Thetford and another in Colchester, both of which were cross-pollinated with blight-resistant pollen from TACF's Meadowview Research Farms in Meadowview, VA. The orchard at High Shelter Farm is the second breeding orchard in Vermont—the first at Shelburne Farms, just out side of Burlington.

A similar effort took place at Shieling State Forest in Peterborough, NH where a dozen enthusiastic volunteers met on a damp morning to plant 119 nuts in New Hampshire's first American chestnut backcross breeding orchard. The volunteers planted 100 nuts from a mother tree in Farmington, NH pollinated with backcross pollen from TACF's Meadowview Research Farm.

The establishment of blight-resistant nut-bearing American chestnuts in both states will be a lengthy process. Only a handful of nuts in either new breeding or-



**A planting crew of NH Division of Forests and Lands employees, TACF members and local volunteers planted the Shieling Forest Orchard in Peterborough, NH on May 15, 2008. Photo courtesy of Leila Pinchot.**

*(New Orchards, Continued on page 3)*

## FIRST TIME POLLINATORS

Tom Simmons, VT/NH TACF Member

"That's it? I thought there would be much more to it!" These were my first thoughts when Kendra Gurney, TACF's New England Regional Science Coordinator, demonstrated the pollination techniques to my friend Jim Powers and me. We were just about to begin our work on the American chestnut tree at Camp Edgewater in Colchester, Vermont. I had been checking out the developing flowers for weeks by then...taking digital photos and e-mailing them to Kendra for her opinion on the female flower development. A few weeks earlier, we had clipped off the male flowers and placed bags around the clusters of female flowers spread all over the tree. When I first heard about this whole process, I thought we were going to have to find each and every male flower on the entire tree and remove it to protect the remaining female flowers from native pollen. When you are looking at a tree nearly sixty

*(First Time Pollinators, Continued on page 5)*

## PRESIDENT'S CORNER

## Grace Knight, VT/NH TACF President



Planting a chestnut seed at High Shelter Farm in Perkinsville, VT.

Photo courtesy of Leila Pinchot.



This planting crew of TACF members and volunteers planted the High Shelter Farm Orchard on May 10, 2008.

Photo courtesy of Grace Knight.

My voice was getting a bit hoarse. I was staffing the TACF display at the New Hampshire Farm and Forest Expo in Manchester this past February 7. Other volunteers and I had spent the day explaining to interested visitors our **plans to restore American chestnut to Vermont and New Hampshire**. Groups of visitors had stood several deep all morning and into the afternoon. Scores of times I had gone through the backcross breeding

chart and showed the map of the 9 surviving wild trees in our states. I explained how our group has pollinated these trees with blight-resistant pollen developed at TACF's research farm in southwest Virginia. I pointed

at pictures of the three tree orchards where the nuts are planted each spring.

"But what can I do here in New Hampshire for chestnut trees?" asked one visitor. He was a forester and logger in his thirties, in plaid shirt and bill cap.

"Well," I said, "we will have a planting session in Peter-

borough, New Hampshire this May. We'll put about 200 nuts in the ground, with tree cages and mulch to protect them. And then we'll have a potluck lunch."

A peculiar look crossed the man's face. He got very quiet. I thought he was reacting to the word "potluck." He might, like many New Englanders, have had a lifetime of overexposure to baked bean casseroles. Afraid I might be offending him I quickly added, "But you wouldn't have to stay for the lunch."

"He's crying," the man's female companion said quietly. "He didn't know that chestnut could come back."

Indeed, my visitor had tears in his eyes. Quickly recovering himself, he said, "**It seems incredible**. The Asian long horned beetle is moving in on sugar maple; the ash yellows are killing our ash and emerald ash borer beetle will be here to finish them off; the chestnut is all dying of blight and hemlock woolly adelgid is in the state. So many trees are dying. Your group is the first one I've seen that has a clear plan to defeat an organism killing our trees." On the spot, he filled out a membership form and paid his first year's dues.

Well, this is the first time I've driven a logger to tears.

**What drew me to chestnut restoration?** An interest in one of the most difficult biological challenges of the last century: how to overcome a fungus that all but exterminated what once was a dominant tree in the American hardwood forest. My love of local history and long walks in the woods. The very human desire to right a terrible wrong: how could we humans accidentally, carelessly, introduce a fungus that would wipe out one of our most beloved native trees? And a sense of fun and adventure: the first large surviving chestnut I ever saw involved crossing private land without permission, walking across a rail trestle (doubtless an illegal activity, certainly a foolhardy one as a freight train barreled by not 10 minutes after my guide and I cleared the trestle) and viewing a tree, 80 feet tall, noble in its beauty and tragedy, as half of its crown was in magnificent full flower, and the other half was brown and dead of blight. The thrill of seeing a real, live, wild chestnut, in my sleepy corner of Vermont, was akin to sighting

(President's Corner, Continued on page 3)

## PRESIDENTS CORNER (continued)

Sasquatch, or discovering the Loch Ness monster. Something that shouldn't exist was, improbably and wonderfully, right there in plain sight.

Our Vermont/New Hampshire State Chapter of TACF is less than two years old, but robust. We are 218 members strong. Six of our members have paid dues continuously since before March of 1990, and therefore will be offered a chance to purchase the B<sub>3</sub>F<sub>3</sub> nuts from the national organization this spring. These nuts are the **holy grail of chestnut restoration work** and the most advanced backcross nuts that the na-

tional organization has yet produced.

The heart of our work as a chapter involves three things: identifying wild trees in our state that are suitable for pollination with backcross pollen, planting and maintaining orchards for resistant nuts, and spreading the word about our chapter and its aims. I encourage each member reading this to **work on one of these goals this year**: find out if anyone you know has knowledge of a wild American chestnut,

and report it to Kendra Gurney. Recruit a new member to our chapter.

Attend our annual meeting. Plant backcross chestnut seeds. The High Shelter Orchard is in my backyard, just outside Ascutney, Vermont and just across the state line from Claremont, New Hampshire. On Saturday, May 16, starting at 9:00 a.m. we will plant out about 200 seeds in this orchard, fertilize them with manure from my sheep, protect them with tree cages, and hope to be done by noon.

**And yes, there will be potluck.**

## NEW ORCHARDS (continued)

*(Continued from page 1)*

chard will eventually grow into trees showing moderate levels of blight resistance. Those that do will be used to breed the next generation of chestnuts specific to northern New England. The NH Division of Forests and Lands and TACF have developed an agreement to establish chestnut orchards on NH state reserves, as well as allow TACF to pollinate American chestnuts growing on NH state lands. An effort to identify new mother trees and conduct research on breeding stock is also being undertaken through a TACF partnership with the University of Vermont and the US Forest Service Northern Research Station in South Burlington, VT.

TACF and our VT/NH Chapter will be planting additional backcross chestnuts next year in our existing orchards and at new sites. These efforts will be under the direction of TACF New England Regional Science Coordinator Kendra Gurney. Contact Kendra to learn more about volunteer opportunities or report an American chestnut tree that may be useful for our breeding program: 802-951-6771 x1350 (office), 802-999-8706 (cell) or [kendra@acf.org](mailto:kendra@acf.org). Please see the Calendar of Events on the last page for a list of upcoming opportunities. Think about volunteering; we can always use your help!

*If you'd like to learn more about volunteer opportunities or report an American chestnut tree that may be useful for our breeding program, please contact Kendra at 802-951-6771 x1350 (office), 802-999-8706 (cell) or [kendra@acf.org](mailto:kendra@acf.org)*

## BREEDING UPDATE

### Kendra Gurney, TACF New England Regional Science Coordinator

The VT/NH Chapter of TACF is less than two years old. However, some active members have been participating in the breeding program for blight resistance since 1999, when a mature tree in Shaftsbury, VT was pollinated with second-backcross pollen. Pollination work resumed again in 2004,

when four different VT trees were pollinated. Efforts have continued since then, with the help of local TACF staff, members and supporters. The chapter has currently pollinated 10 different mother-trees, eight in VT and two in NH. Plans for 2009 pollinations are underway, with a focus on finding more

NH chestnuts to work with. To report a native, flowering chestnut, contact Kendra Gurney: [kendra@acf.org](mailto:kendra@acf.org), (802) 951-6771 x1350 (office) or (802) 999-8706 (cell).



**This female American chestnut flower is ready to pollinate.**  
*Photo courtesy of Kendra Gurney.*



American chestnut seedling. Come to the Annual Meeting for your chance to bring one home!

Photo courtesy of Kendra Gurney.

*“Until recently, little effort has been expended to understand and enhance the cold tolerance of American chestnut – a trait needed for full restoration in the northern-most reaches of the species’ historic range.”*

Cold damaged twig on a young chestnut growing in VT.

Learn more from Dr. Paul Schaberg at our Annual Meeting!

Photo courtesy of Kendra Gurney.



## FIRST ANNUAL MEETING!

### Kendra Gurney, TACF New England Regional Science Coordinator

Our first Annual Meeting will be held on Saturday, May 2 at the Weathersfield Center Meetinghouse in Weatherfield Center, VT. Come find out what our young chapter has been doing and how you can get involved!

A welcome and chapter introduction by VT/NH President Grace Knight will start the meeting at 10:00 am. Kendra Gurney, TACF New England Regional Science Coordinator, will follow with a brief overview of the breeding program and the chapter’s accomplishments to date. Our

keynote speaker, Dr. Paul Schaberg, a research physiologist at the USFS and a member of VT/NH TACF’s Board of Directors, will then present his current research looking at American chestnut cold tolerance and likely influences on future restoration (see below). We will break for a potluck lunch and finish out the day with an on-site planting workshop. There will even be an opportunity to bring home your very own pure American chestnut seedling! See insert for more information and directions. Hope to see you there!

## AMERICAN CHESTNUT: COLD TOLERANCE AND RESTORATION

### Dr. Paul Schaberg, USFS Research Physiologist and VT/NH TACF Director

I lead a collaborative group of scientists and managers from the US Forest Service, Northern Research Station, The University of Vermont, and TACF who are working to overcome a likely obstacle to the restoration of American chestnuts to the Northern Forest: the susceptibility of the species to freezing injury during cold winters. Until recently, little effort has been ex-

pended to understand and enhance the cold tolerance of American chestnut – a trait needed for full restoration in the northern-most reaches of the species’ historic range. In-

deed, recent research by our group (thanks to Kendra Gurney and others) has shown that American chestnut seedlings (both pure native plants and back-crossed stock) are vulnerable to shoot freezing injury and experience winter dieback in the field. We are now establishing a research study to evaluate two methods for bolstering the cold tolerance of American chestnut trees: 1) through the identification of seed sources exhibiting greater cold hardiness, and 2) through studying the influence of overstory silvicultural treatments (levels of forest canopy thinning) on the growth, carbohydrate relations, cold tolerance and winter injury of chestnut seedlings. We will

evaluate these possible influences on cold tolerance through the establishment of a series of American chestnut progeny plantings on the Green Mountain National Forest. Both genetics and silvicultural treatment could influence cold tolerance physiology and growth. Silvicultural treatments could also alter levels of cold exposure that incite injury. In addition to identifying genetic stock and management alternatives that may bolster American chestnut cold tolerance, the plantings established will be a long-term resource for evaluating the influence of genetics and management on American chestnut restoration in the north.

## FIRST TIME POLLINATORS (continued)



**Tom Simmons** needed for  
**pollinating chestnut** success,  
**flowers in** that it  
**Colchester, VT.** never felt  
*Photo courtesy of Kendra* like I was  
*Gurney.* getting a

good take on each individual flower. I wanted to see the styles coated in yellowish dust, confident that I had **achieved overkill!** Not to be, though.

So the three of us continued to work on the tree, pollinating beneath the 68 bags that we had installed earlier, and careful to leave a few control clusters to check our timing on the initial bagging operation. Kendra and I worked from large ladders and JP worked out of a Green Mountain Power bucket truck that the company had so **generously donated** to the cause. It wasn't long before a technique was achieved: gently remove the *Twist' em Tie* on the bag covering the flower cluster, set the *Twist' em Tie* down in a safe place, remove the bag, set it down in a safe place, carefully remove the lid from the backcrossed pollen vial, find a safe place to set the lid down, cover the top of the vial with the microscope slide, tip the vial, stand it back up, carefully turn the slide over, find a safe place to set the vial down, replace the lid on the vial in case the safe place you chose to set it down wasn't so safe, gently smooch the styles into the circle of pollen on the slide, set the slide down in a safe place,

return the bag to the cluster, and finally reattach the *Twist' em Tie* carefully and securely. After a few times, I no longer thought it was so simple or so easy. For one thing, **three (even four) hands seemed to be required.** And another thing - there just weren't a lot of safe places to set delicate items down on the top of a ladder ten feet in the air or in the cramped environs of a bucket truck outfitted for very different work. Things fell over, dropped from the ladder, got put somewhere unrememberable, etc. The job required us to concentrate and skip no steps in the routine, or we would be starting over from the beginning. I developed a new **respect** for the tree climbers who pollinated the forest chestnuts in recent years. How did they manage that procedure while supported only by a harness and a rope? I personally did somewhat less than half of the bags, and the hour and a half flew by. I had come to the conclusion that I was doing the best I could. The results would either be great or they would be disastrous. **The die was cast.**

The days and weeks after that pollination

*"I had come to the conclusion that I was doing the best I could. The results would either be great or they would be disastrous. The die was cast."*

*(Continued from page 1)*

feet tall and **loaded** with flowers, that task seemed to be impossible. Needless to say, I was greatly relieved to find out that we would only deal with a finite and manageable number of flower clusters.

Kendra showed us two methods of pollination: the microscope slide method and the "pollen mountain" method. **The microscope slide method** involved tipping the vial of pollen upside down with a microscope slide as a lid and then re-righting the vial. A tiny circle of pollen grains remained behind on the glass that could then be rubbed against the styles on the female flowers. The "pollen mountain" method required simply tapping a mound of pollen into the cap of the pollen vial and dabbing the flower styles gently into the "pollen mountain". I tried both methods at first, but I soon came to agree with Kendra that the microscope slide method was better. In all honesty, neither method gave me confidence that I was being successful. **The grains of pollen are so small** and so few are



**James "JP" Powers** pollinating from a bucket truck donated by **Green Mountain Power.**  
*Photo courtesy of Kendra Gurney.*

*(First Time Pollinators, Continued on page 6)*

## FIRST TIME POLLINATORS (continued)



(Continued from page 5)

session passed and the burs grew large both inside the bags as well as all the ones we hadn't touched on the rest of the tree. Those tiny female flowers enlarged many times over. I don't think I had ever **watched a developing tree fruit so closely before in my life...truly astonishing!**

Last summer was an exceptional growing season with plenty of moisture and warm nights. Many berries and fruits had a bountiful

year. The chestnuts were no exception. Most of the bags were literally bursting from the expanding burs.

The timing of the final harvest was not quite so critical. As long as we gave the tree plenty of time to develop the nuts, and still beat the squirrels to the prize, we were okay. The Green Mountain Power bucket truck came for a third time to pick the harvest. That went a lot quicker than the previous procedures. Still, the results were not known; the

burs could be full of undeveloped nuts. Kendra was kind to inform us within days, however, that the harvest had been successful: **388 fertile nuts!!** And, very importantly, zero developed nuts inside the control bags!! A bounty that we could all feel like we had a hand in. This experience left us with the confidence that we may have played a crucial role in the **restoration of the magnificent American chestnut** across the eastern forests.

Tom Simmons  
pollinating from a ladder.  
Photo courtesy of Kendra Gurney.

A "Thank You" also goes out to all the landowners, members, supporters and volunteers that helped make the 2008 pollination season possible!!

## A BIG "THANK YOU" FOR POLLINATION DONATIONS!

Kendra Gurney, TACF New England Regional Science Coordinator

Pollinating an American chestnut tree requires physically working with each female flower. For smaller trees, a ladder is often sufficient, however some trees that our VT/NH Chapter has worked with are actually quite large! These trees require a bucket truck or tree climber to access the flowers. The VT/NH Chapter received some very generous donations of these services during the 2008 season. If you know of a bucket truck or tree climber that may be interested in donating

their services, please contact Kendra Gurney: [kendra@acf.org](mailto:kendra@acf.org), (802) 951-6771 x1350 (office) or (802) 999-8706 (cell).

### A Big "Thank You!" from VT/NH TACF

The VT/NH Chapter of TACF would like to thank the following businesses for donating services and assisting controlled pollination of native American chestnuts!

- **Green Mountain Power**  
Colchester, VT
- **Bartlett Tree Experts**  
Hooksett, NH and Manchester, VT
- **DJ's Tree Service**  
Colchester, VT

A "Thank You" also goes out to all the landowners, members, supporters and volunteers that helped make the 2008 pollinations possible. We couldn't do it without you!



Arborist services were donated by Bartlett Tree Experts.  
Photo courtesy of Leila Pinchot.

## HUNTING THE AMERICAN CHESTNUT

Terry Gulick, VT/NH TACF Secretary



**An American chestnut leaf.**

*Photo Courtesy of Kendra Gurney.*

Hunting for American chestnut trees can be **exciting** and **rewarding** to persons dreaming of seeing this species returned to the forests and back yards of the eastern United States.

July 3, 2004 was a big day for me when an article in our daily newspaper told of The American Chestnut Foundation (TACF) and its work—to return a disease-resistant chestnut back to the landscape. What’s needed? **Mature, flowering** American chestnuts that are **easily accessible** for pollinating with pollen from the Meadowview Research Farm in southwestern Virginia.

A number of sightings have been reported in both Vermont and New Hampshire over the last several years. Some of the earlier discovered trees have been used to produce seed nuts which have now becoming young seedlings—some of which hopefully are **disease resistant**.

How to find wild American chestnut trees? Talk up the Foundation’s work asking if any known trees exist. It is surprising the number of people coming forward with information

about sightings.

Another approach is news articles in which readers are asked to contact a member of TACF with information about possible American chestnut trees. An exhibit at a local library might result in contacts as well.

Disappointments? There can be. Confusion between an American chestnut and a **horse chestnut** can cause a possible sighting to be the latter tree. American chestnut has a long, single leaf, unlike the palmately compound leaf of the horse chestnut. Both American chestnut and horse chestnut produce a shiny brown nut, but American chestnuts are sweet, while horse chestnuts are bitter and unpleasant tasting. Also, another variety of chestnut, the Chinese chestnut, is sometimes found planted around dwellings, and here may be another source of disappointment.

But **imagine** the pleasure felt when a mature American chestnut is found in our region! Two years ago, a neighbor of mine told me of a large, tall chestnut growing by the bank of the Williams River in Rockingham. Asked if I wished to see it, I jumped at the chance and hiked with my guide to the tree in question. **“Yes!” I exclaimed,** “It’s got to be an American chestnut.” Positive identification was obtained when I sent leaf

samples to our Regional Science Coordinator, then Leila Pinchot. Unfortunately, this tree showed signs of blight. The tree was also in a location that made it inaccessible for use as a mother-tree in our breeding program. However, when the tree dies, I hope to obtain the owner’s permission to harvest it and use the wood for chapter fundraisers. It is about 14 inches in diameter, large enough for making wooden bowls. Since seeing this tree, I have viewed others in southern Vermont, some of which are in **excellent health**.

Once a tree is found, **leaf and twig samples** should be sent to our TACF New England Regional Science Coordinator, Kendra Gurney (contact info on pg 8), for verification. If verified as 100% American chestnut, accessible, and producing flowers, the tree may be included in the breeding program.

Readers who think they know the location of an American chestnut tree should fill out a **“Tree Locator Form”**, available as a PDF download on the Foundation’s website. Go to [www.acf.org](http://www.acf.org), click on the link to our Vermont/New Hampshire State Chapter, and find the downloadable form.

**Readers who think they know the location of an American chestnut tree should fill out a “Tree Locator Form” available on-line.**



**Terry Gulick helping to pollinate a VT mother tree.**

*Photo courtesy of Leila Pinchot.*

VT/NH CHAPTER



**VT/NH Chapter of  
The American Chestnut Foundation**

Care of:

Kendra Gurney

TACF New England Regional Science Coordinator

USFS Northern Research Station

705 Spear Street

South Burlington, VT 05403

Office: (802) 951-6771 x1350

Cell: (802) 999-8706

Email: [kendra@acf.org](mailto:kendra@acf.org)

OR

Grace Knight, VT/NH TACF President

(802) 263-9613

[gsknight@tds.net](mailto:gsknight@tds.net)



## CALENDAR OF EVENTS

**Saturday, May 2, 2009**

**First Annual Meeting!**

10:00 am—2:00 pm

Weathersfield Center Meetinghouse

4 Center Church Rd, Weathersfield Center, VT

Join the VT/NH Chapter for our first Annual Chapter Meeting!! The meeting will begin with a series of informative presentations, followed by a potluck lunch. An on-site planting workshop, as well as an opportunity to bring home your own American chestnut seedling, will finish out the event! For more information see Annual Meeting on page 4 and the insert for complete schedule and directions.

**Sunday, May 3, 2009**

**Herricks Cove Wildlife Festival**

10:00 am—4:00 pm

Join the VT/NH Chapter at our display table!

Herricks Cove, located on Route 5, one mile north of junction with Route 103, Rockingham, VT

Contact Grace Knight for details: [gsknight@tds.net](mailto:gsknight@tds.net) or (802) 263-9613

**Saturday, May 16, 2009**

**Orchard Planting at High Shelter Farm**

9:00 am—2:00 pm

Planting followed by a potluck lunch

328 Gravelin Rd, Perkinsville, VT

Contact Grace Knight for details: [gsknight@tds.net](mailto:gsknight@tds.net) or (802) 263-9613

**Wednesday, May 13, 2009 (Tentative)**

**Orchard Planting at Shieling Forest**

10:00 am —2:00 pm

Planting and orchard maintenance

Old Street Rd, Peterborough, NH

Please RSVP to Kendra Gurney for more details:

[kendra@acf.org](mailto:kendra@acf.org), (802)951-6771 x1350 or (802)999-8706

**Summer 2009: Pollinations!**

We will continue pollinating VT and NH mother trees this summer. For info contact Kendra Gurney: [kendra@acf.org](mailto:kendra@acf.org), (802)951-6771 x1350 or (802)999-8706