



THE BUR

Volume 25, No. 2

Newsletter of the New York State Chapter of The American Chestnut Foundation

Fall 2019

Part III: The Long and Difficult Road to the World's First Blight-Resistant Chestnut SUNY-ESF / NY-TACF Partnership Produces Science Breakthroughs

By John Neumann, NY-TACF Secretary & Vice President for Education

In Parts I and II (appearing in the Fall 2018 and spring 2019 issues of this newsletter), we reviewed the history of why and how our chapter and the SUNY-ESF American Chestnut and Restoration Project were formed, along with the people who caused it to happen. This article describes the research itself. How did our chapter assist? What were the research breakthroughs?

How did NY-TACF help ESF's research?

Our four chapter founders (Herb & Jane Darling and Stan & Arlene Wirsig) visited ESF in 1988 and recruited Drs. Charles Maynard and William Powell to develop a tree resistant to the chestnut blight. This approach, proposed by Stan Wirsig, would keep 100% of the American chestnut genes, while adding a gene that would protect the trees from the blight.

While nothing like this had been done before, Drs. Maynard and Powell signed on to this innovative approach. They established The American Chestnut Research and Restoration Project as the institutional framework within ESF for the long term work ahead.

In addition to financial support directly from our chapter, we arranged financial support from others. Dr. William Powell wrote "With the help of President Herb Darling and members of the New York Chapter of TACF, New York State officially recognized the American Chestnut Research and Restoration Project at SUNY-ESF. A NY State Senate bill written by Sen. Mary Lou Rath and supporting Senators

DeFranciso and Marcello, started state funding at \$100K per year and sped up our progress. Then 9/11 happened in 2001 and all state funding stopped, but left us scrabbling to stay afloat. Thanks to President Allen Nichols and NY-TACF members, New York State funding has returned since July 2015 and we hope it will continue."

Our chapter provides more than financial support. Many of our members have given ESF pure American chestnuts and pollen from different parts of the state. The pure American chestnut embryos used in the development of the "Darling" transgenic tree were from the "Pond" tree, provided by NY Chapter director John Ellis' property in Windsor, NY. Our chapter volunteers also have assisted ESF with planting American chestnut trees on ESF sites.

Moreover, scientists from within our chapter's membership help guide ESF research. Stan Wirsig was our first Chapter Vice President for Science. His strong scientific understanding and vision of the pathway to our transgenic tree helped inspire and guide the ESF project. After Stan's passing, John Dougherty took the science lead for our chapter, with professional expertise dealing with regulatory issues. In 2017, John became our second Vice President for Science.

What ESF Research Accomplished

In 2015, the world's first blight-tolerant American chestnut tree, the "Darling 58", was proudly announced. This was the result of many years of difficult research



Drs. Charles Maynard and William Powell

conducted by dedicated chestnut project staff and students at ESF. The blight fungus is deadly to American chestnuts because it digests one of the tree's own defensive tannins to use as a food source. As the fungus grows, it produces oxalic acid, an acid toxic to plant cells. The research team worked to transform chestnut with a gene coding for an oxalate oxidase (OxO) enzyme. OxO breaks the acid down into harmless compounds, thus stopping the blight's acid attack against the chestnut tree.

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New York State Chapter
The American Chestnut Foundation
302 Bateman Road
Laurens, NY 13796
<https://www.acf.org/ny/>

Founded in 1990, the New York State Chapter (NY-TACF) is the oldest chapter of The American Chestnut Foundation, Inc., a non-profit 501 (c) (3) membership organization. NY-TACF, in partnership with the State University of New York College of Environmental Science and Forestry, is working to restore the American chestnut tree to our eastern forests by developing truly blight-resistant American chestnut trees through biotechnology. Membership information may be found on the back page of *The Bur*.

Officers

(Terms End at the 2020 Annual Meeting)

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*Executive Committee

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50 N. Merrimon Avenue, Suite 115, Asheville, NC
28804 828-281-0047 chestnut@acf.org – acf.org

Linda McGuigan – *The Bur* Editor

President's Message



Another summer is nearly over and we will be harvesting nuts soon. Once harvested, they will be available to send to people interested in planting "mother" trees. With the prospect of receiving approval to distribute blight-tolerant "Darling" trees, I encourage all members to plant at least one "mother" tree if possible. This tree can then be pollinated by the Darling tree, increasing the genetic diversity of the blight-tolerant American chestnuts. If you do not have your own place to plant one, consider planting it on a family or friend's property, hunting clubs, or scout camps. If you have never planted a mother tree, or know someone who may be interested, check out the planting, transplanting, and protecting videos I have made at https://www.youtube.com/channel/UCvS_KPwYf7umLID2dRQBNLw. For nuts or other questions on planting, call or email me (607-263-5105 or fajknichols.75@gmail.com).

Our fundraiser launched last spring has nearly reached our goal of \$75,000. We had a large number of donations initially but that slowed down during the summer. We now lack only about \$2,000 to reach our goal, so if you have not made a donation, you can help us surpass our goal. See more information on page 4.

NY-TACF membership continues to increase and we are now very close to 700 members, with many new members coming from other states. I believe this is because people see the value of the transgenic trees and want to be involved in restoring a truly blight-tolerant American chestnut back into the forest.

Next year, 2020, will mark the 30th anniversary of our New York State Chapter (along with the 30th anniversary of our productive partnership with SUNY-ESF). If any members have ideas on how this should be observed and celebrated please let me know. Also, I would like to congratulate SUNY-ESF on being named the third greenest college in North America by Sierra magazine, published by the Sierra Club.

Allen Nichols
President, NY-TACF
fajknichols.75@gmail.com
(607) 263-5105



District Reports

Niko Nantsis, District 1

This past summer has been busy. With help, all of the American chestnut trees within my area of Long Island and Seatuck were pollinated. The task of pollinating the trees was split among groups of people located in different areas of Long Island.

I talked to DEC forester John Wernet about creating an orchard with American chestnut trees from the Long Island area in order to get more genetic diversity for the mother tree program. I have found more trees on the Nassau/Suffolk county line area of the Northern State Parkway and will be collecting chestnuts from those trees. I am excited about the upcoming harvest season to see if I get a large amount of chestnuts. Can't wait to see you all at the annual fall meeting.

Dale Travis, District 3

District 3 has been principally active with planting Mother Trees this year, with some significant success at the New York City Parks Department, who accepted six seedlings for several parks. An interesting comment was made during my recent conversation with a known nature photographer, an environmentalist. It started with trees in general and went to the ESF-TACF program that he hadn't heard about. He was aware of the American chestnut blight, but didn't know how or where it was being treated. After learning more about it, his comment was "THAT's a GMO I can live with!"

Allen Nichols, District 4

I located many trees and entered them into the TreeSnap app (<https://treesnap.org/>) on my phone. I had a display at the Deposit Lumberjack Festival, Catskill Forest Festival, Otsego County Fair, and the Delaware County Fair, where I was assisted by John Neumann. I also gave a presentation to the members of the Oteyokwa Lake Association in Hallstead, PA at the request of one of the members. I treated many of my trees with Cruddy-Bark inoculations and should know by next year if it is helping. One additional step we took to get new members was to advertise free American chestnut nuts in several papers and Penny-Savers. There was a lot of response to that and we hope to do that again next spring. I also went flying with one of the NY members and located 3 flowering American chestnuts.

District 1 – Enrico Nardone, EGNardone@Seatuck.org and Niko Nantsis, nikolaos.nantsis@gmail.com

District 2 – Dale L. Travis, dale@daletravis.com

District 3 – Frank Munzer, MunzerFrank@gmail.com

District 4 – Allen Nichols, fajknichols.75@Gmail.com

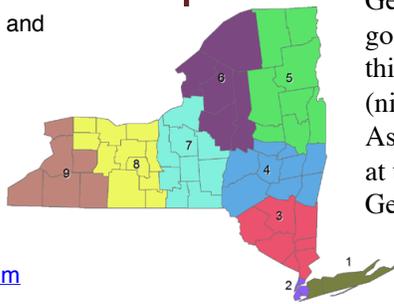
District 5 – Emmett Hoops, emmett.hoops@gmail.com

District 6 – T. Urling Walker, watnrotary@gisco.net

District 7 – Roy Hopke, SnowHawke1@gmail.com

District 8 – Paul Ackerman, trapman1@netzero.net

District 9 – William A. Snyder, wasynderhort@gmail.com



Emmett Hoops, District 5

It's been an exciting time in District 5. From April to June, over 30 individual plantings were made on private properties in Essex and Clinton counties. These ranged from two tree plantings to 10 tree orchards. I expect most of these recipients to become members. The Essex County 4H put together an exhibit on the American chestnut that was shown at two county fairs (see photo.) I brought my chestnut presentation to tourists at a resort in West Virginia. I expect to have much more to say about the connections I made while there. I will again be participating in the Science Teachers Association of New York State's annual convention in Albany with a presentation that includes the most current information about chestnut restoration efforts.



Roy Hopke, District 7

Research is going on at the Sherburne plantation by Hannah Pilkey and Linda McGuigan from SUNY-ESF. The DEC noticed the control pollination bags located on their land. DEC forester Paul Romanenko visited during the harvesting of these nuts, which were used for embryo recovery. I have some trees to plant there, most likely in the spring because by the time the seedlings become dormant in the fall, the weather could be too terrible to work in. However, we will still do some work in the plantation during the balmy part of fall.

It looks like I will have some chinquapin nuts to pass out at our annual meeting this October, for anyone who wants them. I plan to visit the National TACF meeting in

Gettysburg, PA. I remind people that this is a good opportunity to attend, as it is not usually this convenient. Gifford Pinchot State Park (nice) is nearby and there are campsites there. As far as I can tell, the campsites will be open at that time, affording a cheap stay!!! Gettysburg is awesome....

...if you don't mind haunted battlefields.

American Chestnut's Given Out at Relay For Life of Madison County

By Kristen Stewart

The American Chestnut Research and Restoration Project at the State University of New York College of Environmental Science and Forestry (SUNY-ESF) formed our "Researching For Survivors" team at the Relay For Life of Madison County. This is the fourth time we've participated in the event. The Relay For Life was held on June 1, 2019 at Vets Field in Oneida, New York. "Relay" is a grass roots community-based team event that was established to raise money for cancer research and to support and celebrate survivors and caregivers.

Our team, "Researching For Survivors", traditionally hand out wild-type American chestnut seedlings to all cancer survivors in attendance at the event. This year we distributed 125 trees with instructions on how to plant them. We shared our story of bringing back the American chestnut from disease, just like so many people who are fighting their own battle with cancer. Our team raised approximately \$1000 in donations as part of the overall total of nearly \$110,000.



Clockwise: Survivor Kristen Stewart; Survivor Tracy Clark and her husband; ESF Grad student Hannah Pilkey handing out American chestnut trees; and Survivor John Leshar WPE ESF class of 67

Fundraising Campaign Nears \$75,000 Goal

Last spring, we launched a NY State Chapter campaign to raise \$75,000. Our chapter's board of directors had approved \$50,452 to honor a request from SUNY-ESF's American Chestnut Research and Restoration Project, to staff and "gear up" field and greenhouse operations in order to increase the number of transgenic Darling trees (the world's first blight-tolerant American chestnuts) being grown for distribution. Through the generous gifts of many of our members and friends, we are proud to announce that we have already raised \$73,000 toward that goal. It would be wonderful if we could announce at our annual chapter meeting on October 26th, that our goal of raising \$75,000 has been achieved, or even exceeded. To do that, we need at least \$2,000 in donations. Have you done your part? Our sincere thanks to all who have contributed. Your love for the American chestnut, your commitment to science guided research, and your financial support, ensures that its restoration in our forests, will succeed.

Anyone who has not yet contributed (or if you wish to make an additional contribution) please make out your check to NY-TACF, and mail it to:

NY-TACF Treasurer Fran Nichols
302 Bateman Road
Laurens, NY 13796

If you wish to contribute by credit card, use the TACF link <https://www.acf.org/store/donate/> and select "Biotechnology – Supports NY Chapter SUNY-ESF research".

Sincerely yours,
Allen Nichols, President, NY-TACF
(607) 263-5105
fajknichols.75@gmail.com



Jeff Zarnowski, new field and greenhouse manager for the American Chestnut Research and Restoration Project, is prepping the field for a new test plot.

The Long Road

Continued from page 1

Six Research Breakthroughs

1. While the tissue culture and transformation methods were still under development in Dr. Maynard's lab, Dr. Powell's lab first tested the oxalate oxidase in hybrid poplar and showed it could enhance resistance to a fungal pathogen, in 2001.
2. Linda Polin McGuigan published on the first American chestnut transformation (getting the protective gene into the American chestnut DNA) in 2005.
3. The first OxO (oxalate oxidase) tests were performed on transgenic American chestnut callus culture (a growing mass of cells) and reported in 2007.
4. Kathleen Baier developed the high-light, early flowering method so that we could cross our events with "mother" trees within a year of development.
5. The first transgenic American chestnut that showed some level of enhanced blight tolerance was reported in 2014. This was the Darling 4 which showed intermediate resistance (more than wild-type American but less than Chinese).
6. In 2015, it was announced that our more advanced Darling 54 transgenic tree had more blight resistance (tolerance) than the Chinese chestnut, and was the long awaited world's first blight-resistant American chestnut tree.

Research Description:

Because nothing like this had ever been done, Dr. Powell said, "we basically had to build the boat before we went fishing." Dr. Maynard described the progress this way: "The research continually made small but critical steps to improve methods and collect data. It really was a team effort."

The American Chestnut Research and Restoration Project at ESF started with the tissue culture protocol being developed in Dr. Charles Maynard's lab while gene development was performed in Dr. William Powell's lab. After the first five years of the program, four embryogenic cell lines were established in tissue culture; embryos were regenerated into shoots and rooted,



Clockwise: American chestnut somatic embryos, transformed callus, shoot cultures, and rooted shoots.

several plasmid constructs containing gene sequences to improve blight resistance in American chestnut were developed, and there was some transformed callus using marker genes (see photos above and right). Unfortunately, American chestnut callus is difficult to regenerate into whole plants. In the following years, more transformations occurred using different genes, the somatic embryogenesis protocol and shoot culture system were improved, and more cell lines were established in tissue culture.

In 1997, the first eight regenerated and rooted non-transgenic tissue culture

plantlets were planted in the field. Over the next few years, at least 30 plantlets were produced, of which 10 were planted near Syracuse and the rest were given to Herb Darling for planting near Buffalo.

Sharon Bickel improved the rooting and acclimatization methods. She had experiments running at each step to increase final survival rate and cut production time.

This article will conclude with additional descriptions of the research in the Spring 2020 issue of The Bur.



Past and Present research team members photographed at the New York Botanical Garden on April 18, 2012: Bill Powell, Mike Satchwell, Sharon Bickel LaPierre, Kathleen Baier, Katie D'Amico, Andy Newhouse, Kristen Russell Stewart, Bernadette Connors, Amelia Bo Zhang, Linda Polin McGuigan, Haiying Liang, Lilibeth Northern, and Chuck Maynard.

**New York State Chapter of
The American Chestnut Foundation, Inc.
29th Annual Meeting October 25th & 26th 2019**



Meeting: SUNY ESF Heiberg Memorial Forest
7393 Maple Ridge Rd
Tully, NY 13159

Hotel: Quality Inn
5779 State Route 80
Tully, NY 13159
315-696-6061

Meeting Agenda

Friday (10/25) – Quality Inn

6:00 pm **Dinner** – On your own
Meet in lobby to discuss dining options

7:30 pm *Chestnut Harvest Exchange*

Saturday (10/26) – Heiberg Memorial Forest

8 am – 9 am Registration
Become a member or renew membership
Coffee, Tea, Doughnuts
Chestnut Harvest Exchange continued
Silent Auction/50:50 (all day to 2:25 pm)

9:00 am Welcome by *Allen Nichols, President*

9:15 am District Director’s Reports
District 1 Enrico Nardone/Niko Nantsis
District 2 Dale Travis
District 3 Frank Munzer
District 4 Allen Nichols
District 5 Emmett Hoops
District 6 T. Urling Walker
District 7 Roy Hopke
District 8 Paul Ackerman
District 9 William Snyder

9:45 am Science Reports – ESF Staff & Students

10:30 am Coffee Break

11:00 am Science Reports – ESF Staff & Students

12:00 pm Lunch - Catered by *Cathy's Corner Café*

1:00 pm Nut Etching Demo - *Sergey Jivetin*

Business Meeting

*Required for Board Members
Optional for Meeting Attendees*

2:00 pm Annual Meeting Minutes
John Neumann, Secretary

2:10 pm Treasurer’s Report - *Fran Nichols, Treasurer*

2:15 pm Election of Officers and Directors
John Neumann, Nominating Committee Chair

2:25 pm Announce winners to silent auction/50:50

2:30 pm Tour – ESF Tully Field Station



4:00 pm Afternoon session closes

4:30 pm Apple Picking: *Navarino Valley*
3655 Cherry Valley Turnpike, Route 20
Syracuse, NY 13215
(315) 673-9181

5:45 pm Dinner: *The Loft at Vesper Hills Golf Club*
4291 Octagon Road
Tully, NY 13159
315-696-8328

After Dinner: Closing Remarks - *Allen Nichols, President*



To make your room reservations, call the Quality Inn at 315-696-6061 and ask for the NY-TACF Chestnut rate. Reservations must be made prior to October 9, 2019 to receive the rate of \$114 + tax per night. This includes standard accommodations with two queen beds, as well as complimentary breakfast each morning.

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Registration Form

Name(s): _____ Address: _____

 Phone: _____ City: _____
 E-mail: _____ State: _____ Zip: _____

Brief Meeting Agenda:

Friday night includes the Chestnut Harvest Exchange continues from 7:30 pm to 10:00 pm. Saturday morning begins early with coffee, tea, and Danish in a classroom located at SUNY-ESF's Heiberg Memorial Forest. There will be district reports and ESF updates lasting until 11:45 am. Lunch will be at noon followed by afternoon activities from 1:00 pm to 4:30 pm. Saturday night dinner is at The Loft at Vesper Hills Golf Club.

	<u>Cost</u>	<u># Attending</u>	<u>Total Cost</u>
Friday			
Chestnut Harvest Exchange	Free	_____	Free
Saturday			
Regular Registration Rate	\$25 each	_____	\$_____
Student Registration Rate	\$15 each	_____	\$_____
Dinner Reservation	\$26 each	_____	\$_____
		Total Registration:	\$_____

_____ I expect to bring _____ nuts for Harvest Exchange.
 _____ I would like _____ nuts to plant.
 _____ I would be glad to help at the Annual Meeting.
 _____ I would be interested in the following
 Member Sharing Topics _____ .

Make checks payable to:
 NY-TACF
Mail before October 7th to:
 NY-TACF C/O Fran Nichols
 302 Bateman Road
 Laurens, NY 13796



THE BUR
 New York State Chapter
 The American Chestnut Foundation
 C/O Fran Nichols
 302 Bateman Road, Laurens, NY 13796

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Join the New York State Chapter of The American Chestnut Foundation
 Visit www.acf.org, call 828-281-0047, or mail the form (below) to:

The American Chestnut Foundation Inc.
 50 North Merrimon Avenue, Suite 115, Asheville, NC 28804

Enclosed please find my \$40 membership in support of NY-TACF.
 I also make an additional gift of \$ _____ to the New York State Chapter.
 A total of \$ _____ is enclosed.

All memberships to TACF include TACF publications, a car decal, membership to one of the state chapters as well as opportunities to participate in local chestnut activities. Visit www.acf.org or call (828) 281-0047 for more information.

Name: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ E-Mail: _____

Check enclosed Please bill my credit card (Visa/MasterCard/Amex/Discover) This is a gift

Please make check payable to The American Chestnut Foundation

Name on card: _____ Card #: _____

Exp: ____/____/____ CVV# _____ Signature: _____

NY Chapter membership includes the Newsletter *The Bur*. The NY Chapter helps guide research at SUNY-ESF and maintains plantings to keep the American Chestnut gene pool. TACF & NY-TACF are 501 (c) (3) non-profit organizations. Except for the membership services portion of your contribution (valued at \$15) your gift is tax deductible to the full extent allowed by law.