THE BUR

Volume 9, No. 1 | Newsletter of the New York State Chapter of the American Chestnut Foundation, Inc. | Spring/Summer 1999

ESF RESEARCH BRINGS US CLOSER TO BLIGHT RESISTANCE

We have exciting progress to report. Also with the grant from New York State, our principal scientists, Drs. Chuck Maynard and Bill Powell, have built the ESF research team to eight people and have planned the second year's expanded work which is now in progress.

Bill's constructs have promoters (gene switches) that tell the genes when and where to go into action. For example. he is currently testing a promoter that switches on genes in wounded tissues. and one of his graduate students, Bernadette Connors, is hunting for a promoter that will direct genes to be expressed only in the cambium layers under the bark. His team is also studying a chitinase made by Trichoderma, one of the predatory fungi that you use in mudpacking. This fungus attacks the blight under the bark and digests it with the same chitinase Bill is intending to put in the tree.

Besides chitinase, another protective gene produces a small peptide antibiotic (ESF12) that disrupts membranes in the blight fungus, causing it to die. This is one of several peptide antibiotics developed in Bill's lab.

There are several reasons the blight fungus became deadly to American chestnut. One is that it learned to digest one of American chestnuts own defensive tannins and use it as a food source. As the fungus grows, it produces several acids, the most abundant and toxic to plant cells is oxalic acid. Bill's group is attempting to transform chestnut with a gene coding for an enzyme called oxalate oxidase. This enzyme breaks down the acid into

(Research continued on page 5)

PRESIDENT'S MESSAGE

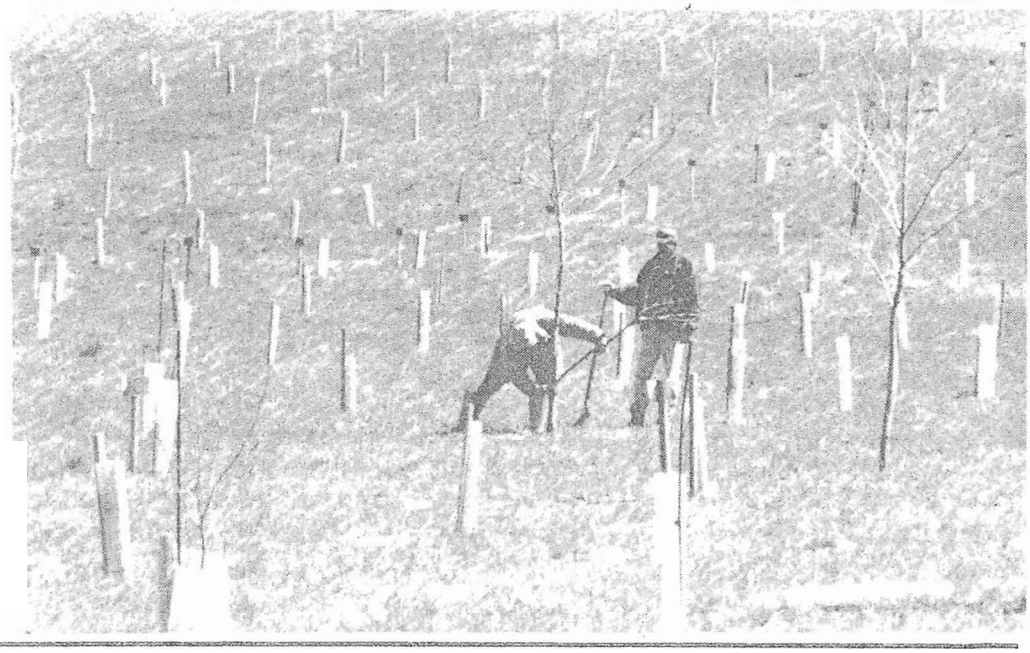
As our wait continues for the genetically transformed trees to grow large enough to test for resistance and then prove tlze resistance is stable, our efforts must turn to genetic diversity in our embryo collection this summer: As this year's embryos will be the start of our official genetic pool for the future, we must have as many different parental lines as possible and controlled pollination so both parents male and female are known.

The first transformed seecllings will be returned to the same general area they came from to keep from having to run provenance tests right away. This is because tlze seedling supply will be limited at first. After the cost of mass production of transformed seedlings are known and large quuiztities of seedlings are avuilable, the provenance tests across the American chestnut's range will begin.*

It is especially satisfying to see coopet-ation and interest expressed by outside organizations for the reforestation projects. I envision many new partners joining this effort soon.

LONG LIVE THE AMERICAN CHESTNUT!

** test for regional suitability*



DISTRICT MEWS

DISTRICT 4 --- LEW DECKER, DIRECTOR

518-725-0473 (Counties of Albany, Columbia, Delaware, Fulton, Greene, Montgomery, Otsego, Rensselear, Schenectady and Schoharie)

The direcior reports he has arranged with the city of Gloversville for a planting along a five-hundred-foot section of a bike trail (linear park) that follows the abandoned bed of the Fonda, Johnstown and Gloversville Railroad.

The conservation classes of the local BOCES career education center agreed to plant 80 American chestnut seedlings along the bike trail. and monitor them as a class project. (Lew donated $100 to help with supplies). The seedlings were acquired from Mr. Rand of Clinton, NY.

The local newspaper gave coverage to the event and the County took a picture of the project for their Web site.

DISTRICT 6 --- T. URLING WALKER, DIRECTOR

315-782-3153 (Counties of: Jefferson, Herkimer, Lewis, Oneida and St. Lawrence)

The program with the DEC and Watertown Conservancy (Zoo) for a demonstration site has four trees that successfully weathered a winter. Two or three more will be added this year.

The original trees of a test begun in 1998 to determine how American chestnuts survive in the northerly Watertown area are surviving in different stages. A follow-up planting was made this year. Results will be reported to the Scientific Committee.

American chestnuts supplied to Professor Michael Bridgen have survived through two winters and are ready for transplanting. He believes survival was due to a good blanket of snow.

This spring, Director Walker presented the American chestnut audio visual program to the District 6 Forest Practice Board.

DISTRICT 7 --- ROY HOPKE, DIRECTOR

607-648-5512 (Counties of Broome, Cayuga, Chenango, Cortland, Madison, Onondaga, Oswego, Tioga and Tompkins)

On April 17 and May 1, District 7 gathered at the Sherburne plantation to do maintenance on trees already planted and to plant an additional 50 trees. There was so much work to do on the planted trees that two days were required to do the job.

The plantation is coming along well, reports Roy Hopke, District Director. He adds there are a few trees far enough along so that they may start to bear in the year 2000 or 2001.

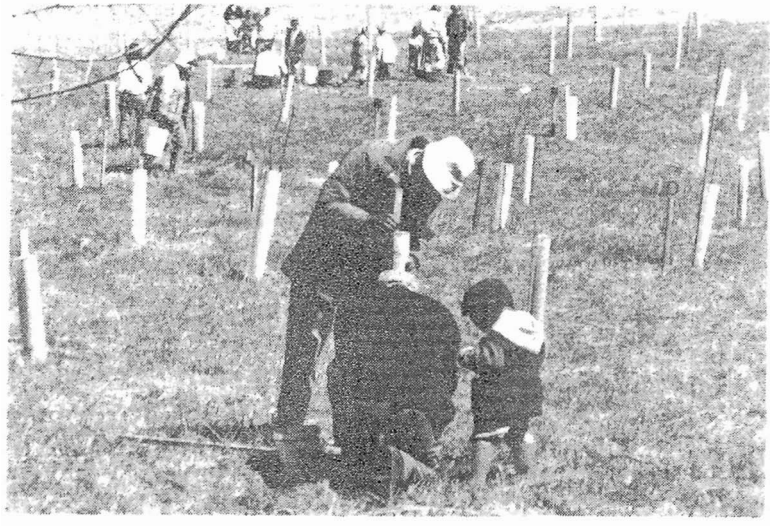
He gave special thanks to the many workers, among them, Jim Donowick for trucking supplies, Bob Novack for spraying with "Cornell Mixture" for deer protection, and hard workers Dan Rigdon, Tim Conner, Ken and Rose Burdick, John Ellis and Byron Huntington.

This June, members will likely be able to do some controlled pollinations, since there now are a few captive bearing trees in a couple of locations. It is probable that a few embryos can be harvested from these.

In additional planting news. Hopke reports District 7 will be placing pairs of chestnuts in participating members' back yards where they can receive vigilant care with quicker results. Also District 7 will be planting a few trees in Chenango Valley State Park in Broome County for both interpretive and possible gene capture reasons.

DISTRICT 9 --- BILL SNYDER, DIRECTOR

716-839-5456 (Counties of Allegany, Cattaraugus, Chautaugua, Erie, Niagara and Wyoming)



On a bright, sunny Saturday in late April. 45 enthusiastic people from District 9 showed up at the Zoar Valley Multiple Use Area to plant American chestnut seedlings. It was the ninth annual Chestnut Planting Day sponsored by the partnership of TACFNY and the New York State DEC. The volunteers conducted maintenance in the plantation in order to ensure that previously planted trees will be able to thrive. 112 new trees were planted.

A LETTER REMEMBERING THE GREAT CHESTNUTS

A day of planting American chestnut trees on April 24 had special significance for me. Some members had invited my wife and me and our grandchildren to the Zoar Valley to help in a day of planting chestnut seedlings.

I was born in 1934, too late to remember the great chestnuts firsthand. But I well remember my Dad talking about them. We lived in East Tennessee, in the foothills of the Great Smoky Mountain National Park, and of course I grew up loving trees. But when I talked about the giant oaks and maples, my Dad would grow pensive and say that I should have seen the chestnuts.

He was a rough and ready man, but his face would cloud with sadness as he described to me the majesty of the chestnut forests and the stupendous loss we had suffered with their demise. He thought it was a tragedy, a crime, that something couldn't have been done to save them.

My Dad has been gone many years now. but as I planted seedlings on that April Saturday, I felt I was doing it in his honor. This was better than putting flowers on his grave. This was giving time and labor for something that would have had his wholehearted blessing.

I hope and trust the plan to restore the chestnuts is successful. My wife and I are glad to be new members of The American Chestnut Foundation, and we thank the Wirsigs for helping us get involved.

Dr. Charles Lamb

O'CONNOR GRANT GIVES EDUCATIONAL PROGRAM A BOOST

The Executive Committee accepted a proposal from the Ecosystem Resources to execute an expanded educational program for 1999. Essentially this involved the preparation of a comprehensive materials kit including a collection of' leaves and burs with nuts of several tree species, the updating and production of the 75-page teacher's manual. the promotion of the prograrn to teachers and their supervisors, teacher training and fulfillment of teachers' orders for the kit and perishable seeds.

Because of a matching grant from the O'Connor Foundation of Delaware County. NY, the program was expanded to include Delaware County and the seven counties contiguous with it. Assistance in the area was provided by The Catskill Forest Association who was our planting partner, the 4-H youth leaders at each County Cornell Cooperative Extension office, and several staffed nature centers and one museum. All elementary and intermediate schools in the eight-county area were contacted in addition to the Superintendent level.

Simultaneous to the O'Conner Foundation area of expansion, Ecosystem Resources contacted all teachers who were in the program prior to 1999 for renewal. All but one teacher wanted to remain active with the program and 75% ordered seed for this season.

As a result of the effort, Ecosystem shipped kits to 100 schools in the expanded O'Conner area accounting for at least 200 teachers and as many as 4,000 students. In the remainder of the state, 20 new kits were shipped and 42 teachers renewed, reaching another 1,250 children with the story of the American chestnut and the fragility of our environment. After an appraisal by the Executive Committee, it was decided that in the future. TACFNY will require grant funding to expand the program beyond the current number of teachers involved. The Strategic Plan adopted by the Committee foresees discussion with national TACF for adopting the expansion of the program in the future. Students and others have expressed interest outside New York State from Maine to Virginia.

NEW YORK ANNUAL MEETING OCTOBER 30–31, 1999

It's at Frost Valley Center in Claryville, NY in the beautiful Catskills.

Reniember the great time we had there a few years ago? It's also appropriate this year since we are focusing an education project with Charlie Chestnut in rnany of the schools in this area.

This time we have the whole of Hussey Lodge so that we will be all together: and those who like to stay up talking until all hours will be able to get together around the fireplace in the central lounge as long s they wish.

Hiking trails, an observatory, fun things like a hay ride or fishing, children's activities. and excellent food (even home-baked cookies for the breaks!) are some of the "plus" things.

The evaluations from last year indicated that the one-day meeting was very exciting and worthwhile, but so concentrated that it was a little overwhelming. So this year we will alternate with a more relaxed agenda.

Friday evening, October 29. soup and sandwiches will be available from 5:00 – 9:00 PM with exhibit set-up and socializing as you arrive. On Saturday there will be the usual stimulating reports of the work done this year, plus the always interesting research progress by our principal researchers; and, a new feature designed to keep us up to the minute!

David Scherf, Co-Director of the new Luke Roehm Technology Learning Center is setting up a workshop for us on understanding and using GPS (Global Positioning System) and GIS (Geographic Information Systems) which will not only help us permanently record the location of the American chestnuts we find and know about, but will map it as well (a boon to field workers). This will be a hands-on event.

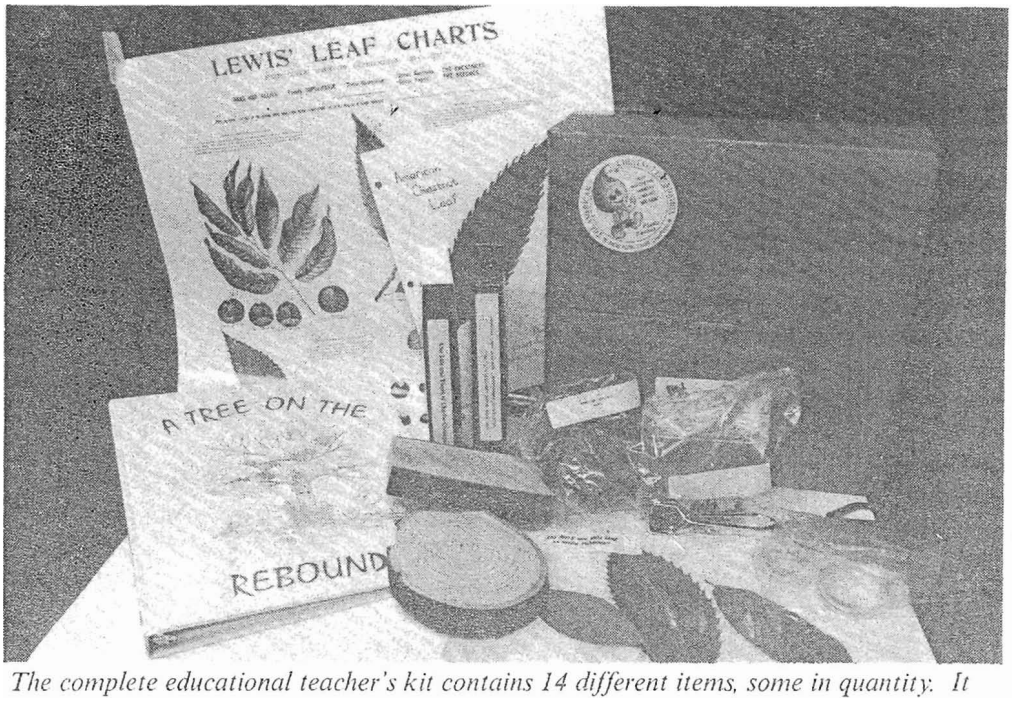
Saturday evening we will enjoy a special dinner with a speaker to be announced. Then, visit the observatory, take a moonlight walk, or just relax and socialize at Hussey Lodge around the fire.

Sunday, October 31, there will be Chapel if desired, Breakfast Focus Croups, our annual Harvest Exchange, and the Board Meeting. The 9th Annual Meeting will adjourn at noon.

A sidelight – a quilting organization is also having a meeting in another building and we are invited to their display of quilts and also to visit the vendors of quilting accessories whomay be there.

It looks like a great fall getaway time with something for everyone.

MARK YOUR CALENDAR NOW: OCTOBER 30–31,1999.



The complete educational teacher's kit contains 14 different items, some in quantity. It includes the 75-page teacher's manual, two videotapes, actual American chestnut, beech and horse chestnut leaves, birrs and nuts. Even kitchen tongs me supplied for handling the prickly burs. The cost of each kit is $30.

STRATEGIC PLAN MEETING LOOKS TO TACFNY'S FUTURE

On February 20 a Strategic Planning meeting was held in Buffalo to review national and NY State Chapter plans reaching out to the year 2004. It was attended by 20 members and guests.

Preceding the review of plans, Marshall Case. Executive Director of TACF and Dr. Paul Sisco, TACF Staff Geneticist, brought the group up to speed on the current national scientific and administrative programs. Part of the following discussion concerned the eventual protoplasm release from TACF's crossbreeding work planned for the year 2004.

Looking ahead to the restoration phase of the New York State genetic program, Herb Darling, TACFNY president, announced that contacts had been made with state agencies. Gerald Mikol, NYSDEC Regional Director, said the questions of the need for permitting environmental studies were in progress. And Frank Dunston, NYS Director of Division of Lands & Forests, said his Department could help in providing nursery assistance, state forest land for reintroduction and contact with the Forest Owners with whom his department is closely associated.

Dr. Charles Maynard from the College of Environmental Science and Forestry in Syracuse discussed the USDA requirements for genetically engineered materials, which is essentially containment of the resistant American chestnut in a controlled field test. Once the tree passes this step, it is free for release. He also announced that Dr. Xing, who had done much of the lead work in creating "treelets" from American chestnut embryos, has left the ESF. Others will be stepping in to continue his work.

As an interesting sidelight on the importance of the American chestnut to New York State Lumbering, Wayne Cooper, Regional Forester for NYSDEC, recounted that of all the hardwoods lumbered in New York State in the first few decades of the 20th Century. the American chestnut represented a significant seven percent of the total.

Following these preliminary discussions, the Strategic Plans for both the national and the NY State Chapter were reviewed. The TACFNY presented five goals to be carried out through 2004.

They were:

GOAL I.
Contribute to programs for developing blight-resistant American chestnut trees.

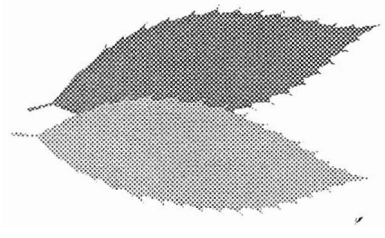
GOAL 2.
Prepare to reintroduce blight-resistant American chestnut trees into the forests.

GOAL 3.
Finance various NY Chapter projects.

GOAL 4.
Develop in-depth back-up Chapter leadership.

GOAL 5.
Develop public awareness and education

Those wishing to see the complete Strategic Plan may write for a copy to: TACFNY, c/o Buffalo Museum of Science, 1020 Humboldt Parkway, Buffalo NY 14211.



STRATEGIC PLAN PROJECT GRANT NEEDED

CHESTNUT TREE SURVEY

An important and necessary part of the plan is surveying not only the still living wild American chestnuts but the seed orchards TACFNY has also cultivated through the Harvest Exchanges since 1994. Many of these trees are at the flowering stage and need to be evaluated to choose the best specimens for transformation and eventual reforestation.

The survey will also give information on the trees' current status with pertinent details, such as performance, soil and adaptability, which will be valuable to both breeders and researchers.

We are preparing an RFQ and are looking for a grant to make it happen as soon as possible. Any ideas?

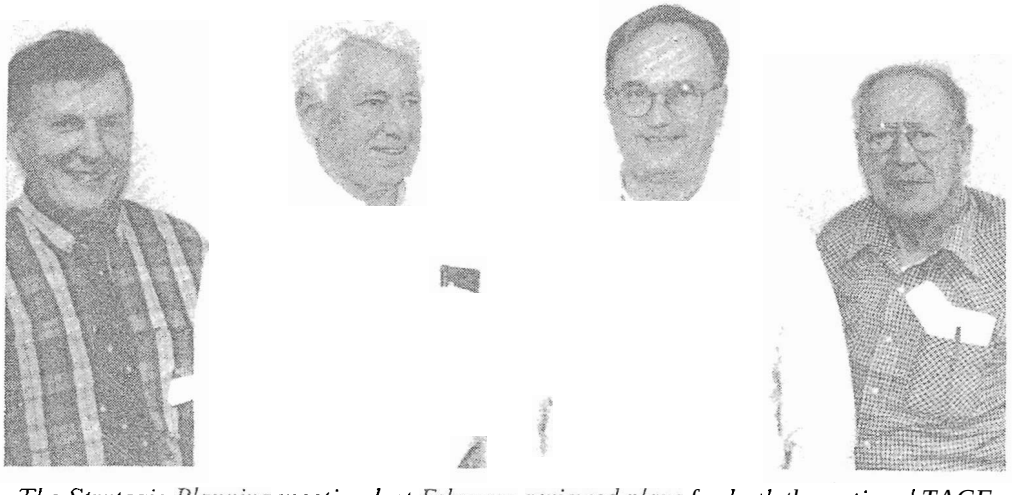
A GPS* FOR EVERY DISTRICT

$2,000 SHOULD DO IT

Having this equipment will make the field work so much easier, may interest more members, and will put the data bank on a precise basis for the future.

If you can help, please let us know.

**Global Positioning System*



The Strategic Planning meeting last February reviewed plans for both the national TACF and the NY State Chapter (TACFNY). Lending the Presentations and the discussions were (left to right) Marshal Case, Executive Director of TACF, Herb Darling, President TACFNY, Dr. Paul Sisco, Staff Geneticist–TACF, and Stan Wirsig, Vice President and Scientific Committee Chair; TACFNY.

(Research continued from page 1)
harmless compounds. It is expected that this gene will fight the blight's acid attack against the chestnut tree.

One of Bill's students, Hongyu Gao. is making gene constructs that will release all three of these gene products (chitinase, peptide antibiotic, and oxalate oxidase) together. With all three of these defense gene products fighting the blight, it is expected that the disease resistance will be very effective and durable.

Chuck, Bill and their team aren't working alone on this project. This research is the result of help from many labs across the country. The wound-inducible promoter was donated from Dr. Gordon's lab (University of Washington), the Trichoderma chitinase was donated from Dr. Harman's lab (Cornell University), and the oxalate oxidase gene was donated from Dr. Allen's lab (Texas Technical University). These building blocks are being put together with Bill's genes in various combinations to make new gene constructs for use in American chestnut.

Transformation is accomplished when Chuck's team inserts Bill's gene constructs into juvenile embryos. Our field workers bring him embryos when they have barely started growing (roughly a month after pollination). At this stage the tiny embryos can be extracted from the developing nut, grown in test tubes, and multiplied into many thousands of new embryos. They can then be bombarded with millions of copies of Bill's new genes. With thousands of tiny targets. and millions of bullets, there is a good chance of hitting at least a few.

Chuck and his team then spend many months sorting out the "hits" (transgenics) from the background of non-transformed embryos. They then begin the painstaking process of regenerating the tiny transgenic embryos back into whole plants.

In the meantime, Sharon Bickel, the newly appointed lab manager in Chuck's lab, is improving the rooting and acclimatization methods. She has experiments running at each step to increase the final survival rate and cut production time. Right now she has seven plants fully acclimatized and growing well in the greenhouse. Once she has some transgenic shoots to work with, she expects no problems in converting them into whole plants ready for the field. Sharon has tested more than 30 different soil mixes to find one that will retain enough moisture and nutrients to grow vigorous plants, but also drain well enough to prevent the delicate chestnut roots from rotting away. Sharon and Seth LaPierre, an undergraduate student working in the lab this spring, have finished the laboratory analysis of the potting mixes and are now testing the best mixes with chestnut plantlets. You will see the results of this research in a poster at the next Annual Meeting in Frost Valley.

Bill's lab is also working on some important steps after transformation. The ultimate question is whether the transgenic chestnuts are blight resistant. The standard test procedure for blight resistance is to grow plants for several years in the field and then poke a small hole in the bark and inject some of the blight fungus. Rill's team has been working on two quick tests. The first is to use much smaller plants growing in pots in the greenhouse. Bill found that he could make a tiny knife cut in a stem smaller that a pencil, inject less that a drop of fungal tissue, and produce blight. He tested resistant Chinese chestnuts and susceptible American chestnuts and got a clear difference. The Chinese chestnuts develop small cankers, but quickly callus over and continue to grow. The American chestnuts seedlings develop cankers that, within a few weeks, girdle and kill the stem. This response looks very much like what happens to large trees in the field.

An even earlier bioassay takes place in a petri dish. While growing in culture, Chuck's embryos often produce lumps of cells called callus. These lumps are useless to him because they can never be grown back into whole plants. Dr. Jun Wang. a visiting scholar from China working in Bill's lab, decided these 'useless' lumps might be able to tell us something about blight resistance. He gathered similar callus lumps from Chinese chestnuts, hybrids between Chinese and American chestnuts. from susceptible American chestnuts, and from transgenic cell lines and placed a tiny piece of fungi on the center of each. Jun could measure the level of resistance in each by how fast the fungus grew over the surface of the callus tissue. It grew the slowest over the highly resistant Chinese chestnut tissue, faster over the intermediate resistant hybrid tissue. and fastest over the susceptible American chestnut tissue. The good news is that the transgenic American chestnut tissue containing the peptide antibiotic gene showed the slowest average growth of the fungus and therefore might be at least as resistant as the Chinese chestnut. The study needs to be repeated several more times to make sure it works every time, but if it works out, it will let the Syracuse team make a first check for blight resistance before the trees even leave the lab.

With all the new gene vectors being tested, and the rooting and acclimatization research ongoing, it is promising to be another interesting year that will bring us closer to a blight resistant American chestnut tree.

Student names are written on tube shelters before planting in a new seed orchard in Lakeside Cemetery near Hamburg, NY. The children are from the Truman Elementary School in Blasdell, NY and, hopefully, will return independently to care for "their" seedlings. Ms. Cheryl Short was the teacher who organized the Earth Day activity.

LEW DECKER RECEIVES HISTORIAN AWARD

District 4 Director Lew Decker's love of the American chestnut may stem from his fascination for the past; for he is the much honored Fulton County Historian. a position he has held for over 15 years.

In March he received the prestigious Franklin Delano Roosevelt Local Government Historian's Profession Achievement Award. It was in recognition of his pivotal role in preserving the history and heritage of Fulton County for more than 40 years as a deputy county Historian and in his current position as Historian. The award is in memory of President Roosevelt's service as historian of the town of Hyde Park in Dutchess County. The award was made by the Association of Public Historians of NY State and the state's Historian Office.

In April, in tribute to his accomplishments, he was recognized on the floor of the New York State Assembly.

IN MEMORIAM
VALUED TACFNY MEMBER
ELTON J. ENDRESS
HONORED BY
CHARLES S. ENDRESS
STAFF & EMPLOYEES OF
BASSETT HEALTHCARE,
COOPERSTOWN, NY

NOMINATIONS FOR THE BOARD OF DIRECTORS

New York State is divided into 9 districts. A director from each district will be sought as well as general board members. Their duties will include attendance at annual meetings, help in developing membership in their district, and seeking out interested leaders. Please send nominations with a brief resume to:

Nominating Committee
TACFNY
c/o Buffalo Museum of Science
1020 Humbolt Pkwy
Buffalo NY 14211

FOR NEW MEMBERS: If you know someone who would be interested in a TACF membership, please pass along this application.
Enclosed is my membership support of:

☐ Gold Leaf, $1,000 or more; ☐ Silver Leaf, $500; ☐ Bronze Leaf, $250;
☐ Green Leaf, $100; ☐ Regular, $40; ☐ Student, $15; ☐ $_____Other

Please make check payable to: **The** American **Chestnut Foundation**

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NEW YORK **STATE** CHAPTER

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