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GIANTS OF THE FOREST

American Chestnuts Are Being Bred To Fight Blight

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Fort Mountain — In a deeply shaded hard wood cove in Fort Mountain State Park, Don Davis imagines what it would have looked like a century ago — just before the chestnut blight hit.

“This probably was a great place for chest nuts,” he said. “The trees would have been huge, rivaling California’s redwoods.”

He believes it can be that way again.

One hundred years after the chestnut blight first appeared at the Bronx Zoo in New York, and decades after trying to develop a blight-resistant tree, researchers are now confident that the once majestic chestnut can return to its former glory.

“Some feel that we’ve already turned the corner, and it’s only a matter of time before the chestnut is again the grand tree of the forest,” said Davis, a Dalton State College sociology professor and a chestnut historian.

The American Chestnut Foundation, whose goal is to restore the tree to its native range in the eastern United States, expects to have blight resistant trees ready for mass planting by the end of this decade.

Looking ahead to that time, Davis and others are trying to establish a chapter of the organization in Georgia to aid them in re-establishing the tree in the state.

“It will create jobs for the timber industry and develop a new source of food for man and animals,” he said.

Fast-growing American chestnuts once made up more than a quarter of the trees in eastern woodlands. They soared to more than a hundred feet tall and produced copious quantities of savory nuts that nourished numerous birds and animals. Their stout, straight trunks yielded unusually strong, root timber ideal for utility poles and fence posts.

“They were the greatest trees in the forest,” Davis said.

Then, disaster struck: A deadly fungus from Asia, *Cryphonectria parasitica*, was discovered on chestnuts in New York in the summer of 1904. The disease was quickly spread southward by wind, rain and birds at an astounding rate of 50 miles per year.

By the mid-1930s, the fungus had reached north Georgia, and by 1940 there was scarcely a tree in the entire state that was not infected with the disease.

Nationwide, more than 3 billion trees were felled by the so-called chestnut blight. The fungus grows in and under the tree bark, creating large visible sores called cankers that prevent the flow of sap. The cankers eventually encircle the tree, effectively strangling it.

The roots of many trees, however, have survived. They still send up saplings that grow up to 25 feet before they, too, succumb to the blight.

“This one will be dead soon,” said Davis, pointing to an orange tint on the trunk of a 20-foot chestnut, the first signs of the blight. But before that happens, he said, it might bloom this summer and produce pollen.

That possibility drew him recently to the state park in Murray County, 90 miles north of Atlanta, where scores of chestnut saplings still sprout from old stumps. Davis wanted to identify chestnuts from which researchers possibly could collect pollen this summer.

Collecting the material from wild American chestnuts is part of the strategy for ultimately restoring the trees to the forest. Pollen from various trees will help create a variety of chestnuts that will enhance chances of survival in the wild, Davis said.



Slow process

Researchers are using both traditional plant-breeding techniques and genetic engineering methods to develop blight-resistant trees. The plan is to end up with an exact copy — or nearly an exact copy — of the American chestnut of old. It’s a painstakingly slow process.

In one approach, plant geneticists at the University of Georgia and other institutions are working to create a blight-free tree by inserting fungal resistance genes from other species directly into the chestnut tree.

In another technique, researchers hope to encourage a virus — first discovered in European chestnuts — that attacks the chestnut blight fungus itself. Researchers at West Virginia University reported last fall that they had good results introducing the virus to cankers in individual trees, but had a problem in getting it to spread through an orchard of chestnuts.

But in what experts say is the most promising approach, researchers at the American Chestnut Foundation’s research center in Virginia have selectively combined American chestnut stocks with blight-resistant Chinese varieties. The crosses have yielded blight-resistant hybrids, but they are much shorter — growing only to 40-50 feet — than the pure American chestnuts, which soared as high as 100 feet and had trunks six feet or more in diameter.

In the forest, the diminutive, slower-growing hybrids can’t compete for sunlight with maples, beeches, ashes, oaks and pines. However, the American-Chinese hybrids are bred back top American chestnuts in a process called “backcrossing.” In essence, the researchers are trying to rid the tree of as many Chinese genes as possible except for one — the gene that confers resistance to the blight.

After several such back-crossings during the past two decades, researchers now have trees that are fifteen sixteenths American chestnut—with the potential for blight-resistance and growing as tall as the old natives.

“Except for a few minor characteristics, they essentially are American chestnuts,” Davis said.

A final step is to breed the trees with each other to produce trees that have a chance of inheriting blight-resistant genes from both parents. They will serve as the mother trees to produce nuts — expected about 2007 — for reforestation.

Only until the nuts are planted and the trees from them grow for 30-40 years will researchers know beyond a doubt that they have produced a blight-resistant tree with all of the characteristics of the original American chestnut.

But researchers and others already are confident of success, and they are now proceeding with plans to restore the tree to the American landscape over the next several decades.

“Our confidence level is very high that we will once again have soaring chestnuts in our forests,” said Phil Pritchard of the American Chestnut Foundation’s regional office in Asheville.

Seeking support

A group of Georgians wants to make sure that the state is not left out in the revival. To that end, Jerry and Dianne Smith of Dalton are among a core of chestnut enthusiasts working with Davis to establish a chapter of the American Chestnut Foundation in Georgia. Such a chapter, Jerry Smith said, would allow the state to tap into the national group’s organizational strength and pave the way for obtaining blight-resistant chestnuts for Georgia.

“We want the whole state of Georgia involved in this project,” he says. “The whole state will benefit if we can bring the chestnut back.”

On The Web: For more information about this topic: call 706-259- 9010 or visit the American Chestnut Foundation Web site www.acf.org or the Georgia Chapter site at www.gatacf.org.