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Fighting the blight: The return of the American chestnut tree

Tue, Apr 28 2009 at 5:40 PM EST

By *Audrey Rabalais, Student Correspondent*



We all hear Nat King Cole croon every Christmas, "Chestnuts roasting on an open fire..." However, when I think back on all of my 18 Christmases, not once do I remember roasting chestnuts. Now, given, this could be because my family is much too busy working overtime, sewing together angel costumes and chewing up all of the outdoor lights. (I consider Skipper, the border collie, a

family member.) In any case, not many chestnuts are available to roast due to the near-extinction of the trees from Appalachian forests due to a blight fungus introduced in the early 20th century that wiped out nearly all canopy American chestnut trees on the east side of the country. As of 1932, they were extinct in Ohio. However, the American Chestnut Foundation (ACF) founded in 1983 has been working to create a blight-resistant chestnut hybrid that can grow successfully in the Eastern forests once again. I was able to speak recently with Dr. Brian McCarthy, professor of plant biology here at Ohio University and the president of the Ohio chapter of the ACF, who was able to provide me with many facts about the chestnut trees and their comeback.

American chestnut history

At one time, the American chestnut made up 25 percent of all trees in some areas of the forests in the eastern United States. It was not as prevalent in Ohio, making up about 5 percent of trees. In 1904, a blight fungus identified as *Diaporthe parasitica* was accidentally introduced from China into the Bronx Zoo. This parasite caused cankers to develop in the trees and by the early 1940's, the American chestnut tree was nearly extinct. "Let me clarify what extinct means in this case," says Dr. McCarthy. "In this case, extinct means that that the canopy, the tops of the trees, die off down to the ground. We can go into forests and find stumps of chestnut trees and even sprouts, but never a full tree."




Why the chestnut?

If you're reading this, you may have the same questions I did for Dr. McCarthy: What is so important about saving the chestnut tree? Do we not have other deciduous trees

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in our Ohio forests? Well folks, the man does not hold a doctorate in forest ecology for nothing! According to McCarthy, most nut-producing trees exhibit what is known as "masting". This means that they produce a seed crop every three to four years. However, the American chestnut produces a crop every single year. "The chestnuts were once the premiere food source of all major vertebrate in the Appalachian forests," says McCarthy. As a result of the blight and in combination with overhunting and loss of habitat, deer, turkey and squirrel populations were nearly extinct from Ohio and Appalachian forests in the 1930's. Yikes! McCarthy says the chestnut is referred to as the "Redwood of the East". Like the giant California redwood trees, American chestnut trees do not rot when they come in contact with the ground or water sources. This makes the bark fantastic for building barns and other structures as it lasts much longer. Lastly, McCarthy adds, "There is the whole natural heritage component. We want to have the value of bringing back the chestnut to restore the forests to their original condition."

And just how do they do it?

McCarthy and other scientists have been working to create a blight-resistant strain of chestnut trees by using what McCarthy calls the "classic breeding methodology." It's the same genetic method bioengineers used to create shorter wheat or larger corn crops. They first found a blight-resistant Chinese chestnut tree and used the pollen from the American chestnut trees to create a hybrid. This hybrid is then "backcrossed" with another American chestnut tree gamete to create a 3/4 American chestnut hybrid. This is repeated until the product of the final intercross is 15/16 American chestnut. It is expected to show a high level of blight-resistance in initial forest test-plantings. McCarthy says it will take 10 years for the trees to fully mature and for the scientists to know if their new tree strain is truly blight resistant. Here's hoping!



Photos:

Top left: Chestnuts roasting over an open fire, courtesy of Flickr.

Middle right: An American chestnut tree in 1915, courtesy of American Chestnut Foundation

Bottom right: A Chinese chestnut tree in 2004, courtesy of Horticopia, Inc.

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