

WHAT CAN YOU TELL ME ABOUT THE Dunstan Chestnut?

By Sara Fern Fitzsimmons and Dr. Bill Lord



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The most common question I get as an employee with The American Chestnut Foundation is, “Can I have some chestnut trees?” And my response is invariably, “What kind of chestnut tree?”

You may all be snickering, knowing that pretty much anyone would want an American chestnut, but that isn’t always the case. We also have to be careful to make the distinction between a “pure” American chestnut, collected from properly identified wild specimens and/or their progeny, and the trees that we are creating with our breeding program for disease-resistance.

There are multiple goals for landowners when they decide to plant chestnut trees. Some landowners simply want to feed wildlife. Some want to feed themselves or others with a commercial crop of chestnuts. Others want a timber tree to grow in their woodlots. And some would prefer that those goals be fulfilled by a native species, while others are indifferent. Depending on what an individual’s goals are, one or more type of chestnut might be suitable.

Depending on who you talk to, there are some seven to 10 species of chestnut in the genus *Castanea*.¹ “The Plant List” gives 179 names given to *Castanea* species throughout the years.² Most of these are synonyms; for example, *Castanea dentata* has been assigned up to eight different names, such as *C. americana*. All of these species can form combinations to make viable progeny, although each amalgamation interbreeds with varying levels of success. This makes for a staggering number potential combinations, especially when one starts making backcrosses, intercrosses, and any number of crosses between, among, and within those species and crosses.

Dr. Sandra Anagnostakis of the Connecticut Agricultural Experiment Station (CAES) keeps a running catalogue of named chestnut cultivars,³ a list that currently has 1,327 entries.⁴ While people have been breeding chestnuts for centuries, Europe claims the most named cultivars (701) with Italy being the top (361). Some variation of “marrone,” the Italian word for “brown” and “chestnut,” appears 135 times in these cultivar names.

In the US, there are have been several prolific chestnut breeders. Some notable names on that list are Luther Burbank, Arthur Graves,⁵ and R.T. Dunstan. While any of these names might ring a bell for our readers, if the amount of calls I get is any indication, I suspect that the name Dunstan is of particular interest.

Dr. Robert Dunstan was a member of the Northern Nut Growers Association (NNGA) who resided in Greensboro, NC. Another NNGA member, James Carpentar, sent Dunstan some scion wood from an American chestnut in Salem, OH. Because the Salem tree had not yet contracted the blight while nearby American chestnuts had, Carpentar believed it to have resistance to blight.

Dunstan took the scion from the Carpentar American chestnut and top-grafted it to chestnut rootstock. Around that tree, Dunstan had planted the name Chinese chestnut cultivars Meiling, Nanking, and Kuling.⁶ These trees were allowed to open-pollinate and Dunstan reportedly took F₁ progeny from the Carpentar tree, presumably after it was pollinated by one or more of those three *Castanea mollissima* cultivars.

These F₁ seeds were planted and grown to flowering. At this point, the trees were backcrossed to all four trees named above. Thirty of the resultant seedlings were taken by Dunstan to his retirement farm in Florida. These trees showed a mix of American and Chinese traits. Because the F₁ trees were produced via open-pollination, the lineage of the offspring cannot be given as a percentage of its parents. Six of the resulting BC₁ seedlings were further propagated and named.

In the 1980s, Bob Wallace, Dunstan’s grandson, commenced planting a 500 tree chestnut orchard on Dunstan farm in Alachua, Florida. The four main BC₁ cultivars, Revival, Willamette, Carolina, and Carpentar, were to create the orchard. Revival, Willamette, and Carolina were patented and received the first patents ever given to chestnut tree varieties, along with Heritage. Seeds from these trees were germinated and planted, and 220 of these seedlings were grafted to the named cultivars.

¹Anagnostakis S. 2009. Identification of Chestnut Trees. *The Nutshell*. 63(3): 11-22. <http://www.northernnutgrowers.org/ChestnutID.pdf>.

²The Plant List. 2013. Version 1.1. Published on the Internet; <http://www.theplantlist.org/> (accessed November 23, 2015).

³The International Society for Horticulture Science (ISHS) maintains a database of contacts, by genus, of those who curate cultivar registries: <http://www.ishs.org/sci/icra.htm>

⁴<http://www.northernnutgrowers.org/CultivarsofChestnutA-Z2014Sandy.pdf>

⁵The “Graves” tree, a named BC₁ tree residing at CAES, which has been used for one of TACF’s major sources of resistance.

⁶Our readers might be interested to know that each of these cultivars have been introduced as sources of resistance in TACF’s breeding program, either and Meadowview and/or through work in the Chapters.

List of accepted,
named
*Castanea species*²

Castanea dentata,
American chestnut –
North America

Castanea pumila,
Allegheny chinkapin –
USA

*Castanea x neglecta**
– Named hybrid of
C. dentata x *C. pumila*
– USA

Castanea ozarkensis,
Ozark chinkapin – USA

Castanea sativa,
European chestnut –
Europe

Castanea mollissima,
Chinese chestnut –
China

Castanea seguinii,
dwarf Seguin chestnut
– China

Castanea henryi,
Henry chinkapin –
China

Castanea crenata,
Japanese chestnut –
Japan



At Chestnut Hill Nursery, Wallace has made selections based upon large nut size, good nut production and growth habits, and most importantly, blight-resistance. He did not select trees to propagate based upon American timber tree traits. His goal was to develop a U.S. chestnut orchard industry, with emphasis on producing in abundance nut of large size and good taste.

The orchard produces seed by open pollination, producing seedlings that are sold to the public. Bob's main market is orchardists, individuals who want a chestnut tree on their property and as a bountiful food source in wildlife plantings. Wallace believes his 500 tree orchard is reaching maturity with the tallest seedling trees reaching a height of 60-feet. The grafted trees are shorter, standing at 25 to 30-feet. He harvests about 5,000-7,500 pounds of nuts per year from this planting.

There has been confusion before regarding whether or not a "Dunstan" chestnut is an American chestnut, going back to the very early years of TACF. A 1988 advertisement for the Dunstan chestnut as "the return of the American chestnut" prompted then TACF president Phil Rutter to write to Chestnut Hill Farms for clarification. The resulting letter from Bob Wallace was published in the Journal of TACF,⁷ and repeats much of the same history presented here.

So, is the Dunstan hybrid an American chestnut? No. If performance of the parent trees is good indication, these trees will not be able to compete with the native trees in our eastern US woodlands. That said, Dunstan trees are great for those wanting nut production for wildlife. In addition, they are commercially available, including at many "big box" stores.

Note the Dunstan trees sold are seedlings. If you want to get a tree that will look exactly like a parent tree and/or be exactly a certain cultivar, you need to get a tree that has been vegetatively-propagated. For chestnuts, that usually means a grafted tree. Most trees sold or otherwise distributed in the US, however, are seedling trees. This means that the tree will exhibit characteristics of both parents. Even if the seed was collected from a known and certified cultivar, the resulting tree is not that cultivar.

The American Chestnut Foundation is one of the best places to go for American chestnut seedlings and the best place for a potentially blight-resistant American chestnut. **For more information one where to purchase chestnut trees, including some grafted cultivars, Dr. Anagnostakis curates a list of suppliers accessible at: <http://www.ct.gov/caes/cwp/view.asp?A=2815&Q=376838>.**

⁷The Dunstan Hybrid Chestnuts. 1989. Journal of The American Chestnut Foundation. 3(1): 38-39. http://acf.org/pdfs/resources/journal/journ_vol3-1.pdf



Five-year Graft Compatibility

IN AN AMERICAN CHESTNUT BREEDING ORCHARD

By Jim McKenna and Brian Beheler

ABSTRACT: Grafting of chestnut is possible, but fraught with uncertainty because graft unions tend to fail over time and the intended scion is lost. This is a condition known as delayed graft incompatibility. We grafted American chestnut (*Castanea dentata*) trees for the Indiana chapter in 2009, and planted numerous grafted trees per clone into an orchard to examine the graft compatibility of 23 clones. After five years in the field, we measured graft compatibility and growth to estimate the magnitude of delayed incompatibility in American chestnut.