



*This is a image of a Bebb oak which is a hybrid of a white oak and bur oak.*

*Photo courtesy: Diana Olszowy*

# Oak Promiscuity — the Dark Side of Oaks

*by Diana Olszowy*

grow out 90 degrees, perpendicularly to the trunk; elm branches expand in the shape of a vase, etc.). When you become proficient in identifying your trees by these characteristics, you begin to notice other, more subtle, characteristics that will assist you in narrowing down your “oak” tree into a “bur oak” tree.

Identifying oaks is especially a challenge, since approximately 20 different native species grow in Kentucky. Though they can easily be broken into “red” and “white” oak groups through the standard identification characteristics, narrowing down to the specific tree may require you to focus on other features, such as the size and shape of the acorn and its cap; hairiness (called pubescence) on the buds and leaves or lack thereof (called glabrousness); or the shape and size of the sinuses of the leaves (which is the space or indentation between the lobes). Learning to recognize these characteristics will enable you to successfully determine the species composition in your woodland—or will it?

Just when you feel confident in your dendrology skills, good ole Mother Nature pulls a fast one. Oaks can be very promiscuous, meaning that they naturally hybridize with each other, but only between their own groups. The “white” oaks only hybridize with members of the white oak group (bur, chestnut, chinkapin, overcup, post, swamp chestnut, swamp white, and white oaks). The “red” oaks only hybridize with members

**D**endrology may not be a term you are familiar with, but it is a science that is practiced every day and in every woodland across the state. More commonly referred to as tree or shrub identification, dendrology is officially defined as the taxonomy of woody plants, including trees, shrubs and vines, and their growth habits and ranges.

When learning to identify your trees, most people initially rely on the leaves. However, this method can be a challenge in a woodland situation where the nearest leaf could be 50 feet up in the canopy. And, since Kentucky’s forests are predominately hardwoods, leaves are usually available only during the growing season. Identifying trees by bud or twig characteristics is an excellent method, but like leaves, buds and twigs must be available for inspection. Most professional foresters rely on identification using a combination of characteristics. Often they use bark characteristics for initial identification and back up their conclusions by examining the site (aspect, soils, etc.); associated species (other trees/shrubs that are found in the same site); and overall tree growth habit (form). Many tree species have a specific growth habit that aids in identification (e.g., blackgum branches



*Photo courtesy: Paul Wray, Iowa State University, Bugwood.org*

# What's a hybrid?



*A hybrid occurs when two closely-related species (e.g. white oak and bur oak, etc.) cross-pollinate with each other creating an offspring which contains genetic characteristics of both parents. The hybrid offspring will not necessarily have a 50-50 split of the genetic characteristics from each parent (e.g. trunk and leaves may resemble white oak, but the acorns are large, round and with a frilled cap like a bur oak). And, it is not uncommon for other closely-related hybrids to cross-pollinate with each other resulting in even more genetic anomalies.*

*The center image is a hybrid cross between a bur oak (left image) and a chinkapin oak (right image); this hybrid is sometimes referred to as "Quercus x hillii" or "Quercus x fallax"; the "x" indicates that the plant is a hybrid.*



Photo courtesy: Keith Kanoti, Maine Forest Service, [www.forestryimages.org](http://www.forestryimages.org)

Photo courtesy: Paul Wray, Iowa State University, [www.forestryimages.org](http://www.forestryimages.org)

of the red oak group (black, blackjack, cherrybark, northern red, pin, scarlet, shingle, Shumard, southern red, water, and willow oaks). If you have identified multiple oaks of the same group on your property, chances are that they may have already been naughty. Many oaks are unable to discriminate against pollination by other species in the same group. That is because they are wind pollinated, and ecological stresses, especially near habitat margins, can cause a breakdown of mate recognition as well as a reduction in pollen quantity and quality in one parent species. These factors basically mean that when the oak is pollinating, any port in a storm will work.

Some of the more common hybrids include:

- Bartram oak – willow oak x northern red oak
- Bebb oak – white oak x bur oak
- Bender oak – northern red oak x scarlet oak
- Deam oak – chinkapin oak x white oak
- Leana oak – shingle oak x black oak
- Saul oak – chestnut oak x white oak
- Schociana oak – willow oak x pin oak
- Schuette oak – bur oak x swamp white oak



Photo courtesy: Kentucky Division of Forestry

Learning to identify these hybrids can definitely pose a challenge. Don't assume that the parent's genetic traits will be split evenly 50-50 in the offspring. The offspring could exhibit any or all of the parents' genetic traits (e.g., a Bebb oak can have the leaves, bark and growth form of a bur oak and just

the acorns of a white oak, etc.). The hybridization of oaks is not a new occurrence, and to further complicate the matter, many of these oak hybrids have been cross-pollinating with other oak hybrids (which is called introgression).

Don't think that oaks have the hybridization and introgression market cornered. Maples, hickories, elms, and even pines cross-pollinate with each other. But like the oaks, these trees, too, are selective—hard maples (sugar, black, etc.) only cross with other hard maples, and soft maples (red, silver, and boxelder) only cross with soft maples. Hickories cross with pecans (same family—Juglandaceae) and produce Hican nuts (pronounced "he-can").

Now for the \$25,000 question: could Kentucky's 20 native oak species, mentioned earlier in this article, actually be only five or 10 individual species and all the others hybrids from the originals? This question is perhaps impossible to answer, but definitely an intriguing mystery to consider.



Photo courtesy: Kentucky Division of Forestry

*The acorns on the right came from a cross between a bur oak and chinkapin oak (left image). These acorns have characteristics of both parents.*

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