Horticulture and Aesthetics of Hybrid Oaks

by Ken Asmus

My interest with hybrid oaks began purely by accident. While collecting acorns I noticed a tree similar to bur oak in characteristics only having white flakey bark and lobed leaves. I tried to stay away from the perimeter of this tree so as to not mix its acorns with that of a nearby bur oak. Due to a large bull on the other side of the fence, I wasn't paying close enough attention and probably collected a few from this tree. The following year I noticed a few seedlings that were nearly twice as tall. By the second year two seedlings reached 5 feet. The next time I collected, I harvested only from this tree and grew them with the parent species. Again, the seedlings were more vigorous and seemed like a cross between white and bur oak. This hybrid is called Bebbs oak and is found throughout Michigan. It only took 6 years for these seedlings to fruit. They have bur oak type acorns with white oak foliage and look consistently identical to each other and strongly resemble the parent tree.

Since my interest with oaks began with looking for sweet acorns, the "years to seed bearing age" made breeding oaks a long-term proposition. For instance, white oak is supposed to take 25 years to fruit. The hybrids seem to be a shortcut. Fortunately, I met Miguel Marquez of Texas, who not only had the same interest in Quercus, but also started such a breeding project in the mid 1950's. I began to graft trees and began raising more seedlings of open and closed pollination. At about the same time, Ralph Kreider, Jr. of Illinois sent me some hybrid bur x English oak seed from a tree in a cemetery in Urbana that J.C. McDaniel had told him about. The seedlings from his particular cross allowed me to raise a few thousand seedlings and make them available for nursery trade. Raising open pollinated hybrids of any plan raises the question of variability and what the resultant seedlings are going to look like. Since I was using these hybrids on the basis of growth rate and precocity, I wasn't too concerned with leaf or tree morphology, i.e. my customers were pretty happy about any oak that can average 2 to 4 feet of growth per year and produce acorns in as little as 4 years from seed. Like all plant populations, there is an average but I began to see more similarities than differences.

For those who appreciate wild collected seed and true to type seedlings, aboretum collected acorns may give you nightmares. Often more than 50% of some progeny may be hybrids. However, this can be also a great resource for looking for better selections that may be clonally propagated and for developing strains which combine characteristics of the parent trees. Here are a few ideas for oak hybrid possibilities:

1. Develop hardy evergreen species (-25°F) that are large trees like the bur oak in size and stature. This would mean having large broad leaf evergreen trees that would not brown out in winter and would be similar to the live oak of the South.
2. Develop strains for fast growth for timber production. Remember, the number one hardwood in North America both in volume and dollar amount is oak not black walnut. Rather than select one individual and clone it genetically similar but not identical selections. This would be similar to *Pinus* ecotypes.

3. Make mast production for wildlife and possible human consumption a viable alternative to annual crops by increasing precocity and yield.
4. Develop many horticultural varieties of oak that can withstand a wide variation of soil types, pollution, compacted soil, gypsy moth, oak wilt, drought and any other special environmental conditions that may exist.

Here are a few of the hybrids we are growing and their general characteristics and growth habits in southern Michigan:

Native Hybrids

Quercus lyrata x *virginiana* Comptons Oak

This densely branched fast growing hybrid produces very uniform seedlings. It is found in southern Louisiana and Georgia. It is not evergreen here (in Michigan) but has survived to -25°F with no damage. I would recommend this oak for zone 6. A few growers have reported 3 to 4 feet of growth on young seedlings. This oak seems to do better in alkaline soil. The leaves are more like the overcup oak but more deeply lobed. Hardy to zone 6.

Quercus phellos x *rubra* *Quercus heterophylla*

This is a fairly common hybrid found where red or black oak hybridize with willow oak. The very uniform seedlings produced from this hybrid usually color red in the fall. Usually the leaves are only slightly lobed. Its growth rate is about the same as the red oak. The acorns look a little more like black oak to me. It is my understanding this hybrid was considered to be a species at one time. Hardy in zone 4-5.

Quercus macrocarpa x *alba* *Quercus* x *bebbiana* Bebbs Oak

Bebbs oak represents a number of distinct geographic hybrids. In Michigan it is more like the bur oak with white oak leaves and flakey bark on mature trees. In the Midwest, it may represent more of the *Quercus alba* parent. Very uniform seedlings eventually produce a densely-rounded crown. The "Taco Bell" oak, found by Guy Sternberg, is a good example of this hybrid and its potential. Hardy in zone 3.

Quercus macrocarpa x *bicolor* Schuettes Oak

This fairly common hybrid is hard for me to identify. Originally, I started selecting individuals for their sweet acorns. They were sent to me from Virginia. At 5 years of age, all of them started to bear. The seedlings appear to be more like bur oak in leaves and swamp white oak in acorns. Growth rate is average here but in other parts of the country in clay or heavy loam this hybrid has grown to 25 feet in 10 years. This would be a good wildlife tree because of the low tannin acorns and may be a timber tree because of its tendency to develop a straight bole even without pruning. Hardy in zone 3.

Exotic Hybrids

Quercus macrocarpa x *robur* Bur English Oak

Fast growing and good resistance to powdery mildew, this hybrid has been around for 50 years or more. One of the seed sources available is closer to English oak. The majority of

the others are intermediate between the parents. Fairly uniform growth habit and fairly quick to bear acorns in 6 to 8 years. Because of a more widespread use of this hybrid, it appears to grow in all types of soil, including very droughty soil. It has been primarily used for wildlife purposes and may have timber possibilties, especially since it averages 2 to 4 feet per year in a wide variety of climates. Hardy in zone 4.

Quercus macrocarpa x *gambelli* Bur Gambel Oak

One of the many Cottam hybrids. Also developed by Miguel Marquez in an effort to develop a precocious sweet acorn oak. Medium growth rate with densely branched crown makes this a nice smaller oak to 30 feet. Seedlings produced are uniform in growth habit with leaves that are intermediate of the parents. A hybrid orchard of this cross is being established just for acorn production. This makes a good street tree as it is tolerant to alkaline soil and very droughty sites. Hardy in zone 3.

Other Cottam Hybrids

We have grown a great majority of the F-2's and in general have found a wide variation within individuals. However, there is evidence that each cross has its own distinct progeny and can easily be identified in the field. One or two more generations would stabilize some of these traits. For instance, the *Quercus robur* x *turbinella* hybrid produces some of the best looking ornamentals we have [at the nursery]. The foliage is dark green and remains on until mid-December. *Quercus garryana* x *turbinella* is by far the most spectacular seedling producer we have. In a protected spot, these are evergreen. Leaves vary from entire to deeply lobed but most look a little closer to the *Q. turbinella* parent. This would be a good candidate to plant out a small number in a more isolated setting and produce seedlings from these. I think they would not show as much variation.

Conclusion

Oak hybrids have provided both confusion and enjoyment to the botanist and the horticulturist. Today, many more of these hybrids are becoming available first as seedlings for mass plantings and eventually as named varieties. Given the geographic range of the genus *Quercus*, the native and exotic hybrids will help create an oak bridge across the United States and the world. Following nature's lead in this ecological theatre, establishing hybrid oak groves can fulfill the purpose of horticulture and help create a stable long-lasting treescape.

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