SELECTING THE RIGHT RED OAK

By Terry Capehart

Chlorosis (yellowing of the foliage) in red oaks is a common problem in the North Texas area that is a result of the tree's inability to obtain iron from high pH alkaline soils. This problem occurs in species or varieties of red oaks that are not adapted to North Texas soils. The solution is to select a variety that can tolerate high alkaline conditions.

The two species that are well adapted to our area are Shumard Red Oak *Quercus shumardii* and Texas Red Oak *Quercus texana*. The problem lies in the fact that other species have very similar leaf shapes or the trees are purchased in the dormant season when there are no leaves to help identify the variety.

Chlorotic Pin Oak

A number of years ago, I began looking for a solution to the problem of identifying oaks which are likely to turn chlorotic in alkaline soils and which ones will thrive. Surprisingly, there is a very simple solution: terminal bud length. I examined literally hundreds of chlorotic and healthy oaks and conducted research in several dendrology books (William Harlow and Ellwood Harrar*, Textbook of Dendrology*, McGraw-Hill, 1969; Robert Vines, *Trees of North Texas,* University of Texas Press, 1982). I discovered that the oaks that require acid soils typically have terminal buds 1/8" or shorter. In fact, the shorter the terminal buds are, the more severe the chlorosis is likely to be and the more stunting and crown necrosis will occur.

Bud Length and Chlorosis

The typical Shumard Red Oak has a terminal bud that is ¼" long and is surrounded by 3 or 4 smaller lateral buds about half the length of the terminal bud. Texas Red Oak has 3 or 4 terminal buds of equal length (co-dominant) about ¼" long, which explains why you almost always find this tree with multiple trunks branching very close to the ground. In the case of the acid loving oaks, such as, Pin Oak, Southern Red Oak, and Cherry Bark Oak the terminal buds are approximately 1/8" long or less and are the same length as the lateral buds surrounding the terminal bud. This test can be used during any season in which the buds are present, which is all year except a few short weeks in early spring when the new leaves are emerging and the new buds haven't been formed yet. I have observed this phenomenon on trees as small as 18" tall in one gallon pots as well as on mature trees. I have seen many trees I thought were Shumards by the leaf shape but the buds were short and they exhibited the chlorosis of the acid-loving oaks. In all likelihood these are hybrids between Shumard and one of the many acid-loving oaks. This would be a common occurrence especially if the seed source came from an area where the ranges overlapped like in East Texas or Louisiana.

Shumard Buds

Texas Red Oak Buds

If you already have a chlorotic tree in your landscape and the tips of the branches have not begun to die back you may try a temporary treatment of spraying the foliage with a liquid iron solution to green it up. Liquid iron can be obtained from any garden supply store in your neighborhood. This is a temporary fix and usually will last only a month or so. In a few rare cases chlorosis can be the result of other micronutrient deficiencies such as manganese which can occur in any tree. If you apply liquid iron it will green up the tree very rapidly usually by the next day. If your tree doesn't green up immediately then this is a strong indication something else is amiss. Chlorotic trees can actually survive for many years, but because it is almost impossible to change the pH of the soil any solution to the chlorosis will be temporary and sooner or later the tree will begin to decline and eventually die.

Shumard Red Oak

The beautiful tree pictured here is a classic example of what a true Shumard Red Oak should look like. Dark green foliage and a round to oval shape. The tree should only be trimmed up to a ratio of 1/3 trunk to 2/3 crown for optimum growth. Shumards do not like wet feet so plant in an area that drains well or dries out quickly after a rain. Depending on the weather conditions the foliage can be very beautiful in the fall with various shades of red. Some individual trees will hold the dead leaves throughout the winter and shed them in the spring as new leaves emerge while others will shed them early in the fall. With a mature height approaching 100 feet and a spread of over 60 feet make sure you plant this tree in an area where there is plenty of room to grow.

Texas Red Oak

Texas Red Oak is very similar to Shumard Red Oak but usually is much smaller and typically has multiple trunks as in this specimen. If the lateral branches are pruned early on, the tree will develop into a normal single trunk tree and be almost identical to Shumard. The multi-trunk versions make fabulous accent trees planted in an island bed surrounded by other shrubs and ground covers. Texas Red Oaks typically have more red and crimson in the foliage in the fall than the Shumard. It can be so spectacular that you will be tempted to pick some of the foliage to adorn your dining room table during the holidays. Because of its smaller size it can fill a spot in your landscape that would not be large enough to support a Chinkapin, Shumard, Bur or Live Oak. Most nurseries do not distinguish between Shumard and Texas Red Oaks and you will need to know what to look for when you go to purchase one. I usually ask for multi-trunk red oak knowing there is a 99% chance it will be a Texas Red Oak. If it is a single trunk it really doesn't make any difference which one you choose.

Southern Red Oak

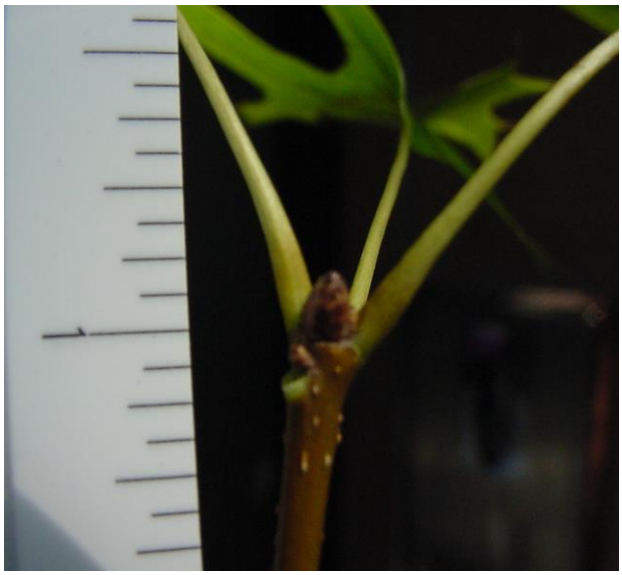
Southern Red Oak *Quercus falcata* is one of the most graceful and majestic of all the oaks and yet it is very difficult to grow in the metroplex. There is only a small portion of soils in the North Texas area that has a low enough pH to support this tree. As you can see in the photo below this specimen was taken from an area where the soils were alkaline and the result was poor growth and chlorosis. Notice the buds on the right are only 1/8" long indicative of an acid-loving tree. Before choosing an oak tree for your landscape take a soil sample and have it tested by the Texas Agricultural Extension Service. This takes only a few weeks and costs only a small nominal fee, which is well worth the investment.

Southern Red Oak Buds

Southern Red Oak Leaves

Pin Oak

The Pin Oak *Quercus palustris* is mistakenly sold as Shumard more often than any other oak and is the least tolerant of our alkaline soils. It has several distinctive characteristics that give it away. This oak has a strong, straight central leader with lateral branches, which tend to have a strong downward recursive habit. Even the smaller twigs will curve downward very sharply. I have seen nurseries cut off the central leader and these recursive branches in order to get it look more like a true Shumard. This oak usually has very small terminal buds, which is a dead giveaway it will not survive here. Unfortunately common names for oaks can be very misleading because the same name can be used for many varieties of oaks in different locales. The term 'Pin Oak' is used for at least a dozen different species. In any case the pictures shown here are very typical of the tree described as Pin Oak in Robert Vines book *Trees of North Texas pp. 124-126.* This oak is a very attractive tree if grown in acid soils such as in East Texas and has beautiful fall colors. But make no mistake it will NOT make an attractive tree in North Texas landscapes. You will find this tree bright green and healthy looking in the nursery but as soon as it is planted in the native soils it will soon turn chlorotic and begin to decline. The difference in growth rate, vigor, color and fullness is dramatic if planted at the same time next to a true Shumard. After several seasons the top limbs will begin to die back and the number of leaves will decline rapidly followed by death. Usually a weakened tree attracts insects and is more susceptible to diseases that will overcome the tree much more rapidly than a vigorous healthy tree.



Pin Oak Buds

Pin Oak Leaves

Cherry Bark Oak

The Cherry Bark Oak is actually a sub-species of Southern Red Oak that occasionally finds its way into our market. It is not as intolerant of alkaline soils as pin oak but more often than not it will turn chlorotic if planted in alkaline soils. The leaf shown here is very indicative of its scientific name *Quercus falcata var. pagodaefolia* that means foliage shaped like a pagoda. This tree grows larger than almost any other of the southern oaks and is usually found in the river bottoms where the deep rich soils are found. Southern Red Oak on the other hand likes the drier soils of the uplands.

There are many other oaks to choose from, in addition to the Shumard and Texas Red Oaks, which will do well in our alkaline soils. They are easily distinguished and you will not confuse them with the oaks pictured here. Among the best choices are Bur Oak, Live Oak, Chinkapin Oak, Sawtooth Oak, and Vasey Oak. Post Oak and Blackjack Oaks are very common in our area as natives but due to transplanting difficulties are not normally available commercially. Vasey Oak is a small tree native to the central portion of the state and may be difficult to find in a nursery. Water Oak is another tree that falls into the intermediate category of alkaline tolerance and will grow into beautiful trees if the soil is not too heavy and shallow. If you see one of these trees in your neighborhood and it is vigorous and healthy then by all means give it a try.

Cherry Bark Oak Buds

Other Oaks for North Texas

Live Oak

Live Oak Leaves

Chinkapin Oak

Chinkapin Oak Leaves

Bur Oak

Bur Oak Leaves

Post Oak Decline

Healthy Post Oak

Post Oak Leaves

Post oak decline is not any one disease or insect problem that causes the tree to eventually die but a complex combination of environmental, pathogenic or infestation stresses. Post Oaks are often over a hundred years old when development takes place near them changing many of the environmental elements of their habitat that they have adapted to over a very long period of time. Any changes in grade, soil compaction, drainage, moisture, soil nutrients or soil temperature can adversely affect post oaks which are extremely sensitive.

Activities during construction such as, parking of equipment or personal vehicles in the shade under the tree, driving over the roots with heavy equipment, trenching, storing dirt or other materials too near the tree, pouring out diesel fuel or other harmful fluids under the tree, hitting the trunk with equipment, cutting and filling in the root zone can all cause the tree to begin to decline and die sometimes years after the completion of the project. As little as two inches of fill dirt can kill a post oak. Instead of trenching across the roots it is much better to trench directly towards the trunk and then bore underneath and resume trenching on the far side. Do not trench closer than 10 feet from the trunk.

After a tree begins to show signs of stress it is very likely to attract opportunistic diseases and insects that will further reduce the health of the tree. It is very difficult to bring an old tree back to health after the decline has become visible. Prevention is by far the best remedy.

Post Oak in Decline

Leaves showing characteristic poodling

Red Oak Sunscald

When a tree is grown in close proximity to other trees, such as in the typical nursery environment, the trunk never builds up a thick enough bark layer to protect the cambium from the sun. Trees with thin bark, such as young red oaks, grown in dense shade for the first few years and then suddenly exposed to the hot sun cannot develop the protective layers quick enough to prevent dessication of this sensitive tissue. The result is a large canker wound that extends from the base of the tree to the first limbs on the side facing the hot afternoon sun.

Even a tree that was grown in full sun then subsequently dug up and transplanted facing a different direction can suffer the same fate. The old time remedy was to apply white wash to the trunk which reflected enough of the heat to prevent the tree from developing a canker wound. While this remedy is still very effective it is very unattractive and few people want their trees painted white. A remedy that I have tried with very good results is to use a narrow strip of coarse burlap attached to the trunk of the tree on the South and West exposures. I cut a strip of burlap about 6 inches wide and long enough to reach from the base of the tree to the first limb then using a standard staple gun I attach the strip with a couple of staples at the top, one in the middle and one or two at the bottom. The idea is to allow the sun to shine through just enough to stimulate the tree to produce thicker bark while preventing it from overheating. If you wrap the burlap around the trunk or use trunk wrap tape, which is impervious to light, then when you remove it the trunk will scald anyway. The burlap is close enough to the color of natural bark it will hardly be noticeable and you just allow it to gradually rot away exposing the trunk to more and more sun allowing the tree to acclimate to the hot conditions.

Red Oak Sunscald Canker