

18. Maintenance:

John Kelsey - - - 2024 May - - - Rev 6

It's funny, black walnut trees appear naturally with no help from us, but when we try to grow them in an organized way, it's not easy. The two major early threats, grass and deer were the topics of chapters 14. and 15. They should be dealt with before planting.

Starting with Seed:

It is easy to pick up walnuts the fall, keep them moist during their dormancy. In the late winter their radicals will poke out and new plants begin growing from the energy stored in the nut kernels.

Unfortunately, our furry and feathered friends also want that stored energy and have been living off it through the winters for millions of years. For success, the walnut seeds need to be protected all winter and until the embryos are depleted and the new plants are about a foot tall.

State tree nurseries plant walnut seed in the late fall and either cover the beds, or just live with the losses. If covers are used, they need to be taken off before the new plants grow through and make a tangled mess. However, young plants are often pulled out by squirrels and crows to get the embryo, but the bed covers reduce the exposure time from months to weeks.

On a smaller scale the percentage lost can be huge. A grower should probably buy seedlings from a nursery and avoid these problems all together. I have planted seeds in the field and got nothing. I have planted seeds in small hardware cloth cages and they were all torn out, and I got nothing. I have built covered beds, took the covers off, when the plants were 6-inches tall and got nothing. On a small scale, a breach in your defenses can lead to a complete wipeout. I built a seed bed with tall sides and a hardware cloth cover. That was expensive, but it finally worked.

Wide Planting and Neglect

Our goal in this document is strictly to produce veneer black walnut stems. Black Walnut trees have no interest in producing veneer stems. They want to spread out and cover the ground with nuts. A spacious planting without some extreme intervention will produce zero veneer timber, hence a pure failure in terms of our goal (, although the walnuts couldn't care less). Just as with tall fescue, given wide spacing and neglect, we can once again guarantee veneer failure.



Figure 11-1. A black walnut plantation on 40 foot spacing growing black walnut for the nuts, but no hope for veneer. This planting was near Birch Run, MI and was cut down and returned to row crops shortly after this picture.

Deer Browse and Antler Rub:

Deer browse is such a killer startup problem that the subject was moved forward and given its own Chapter 15. Deer problems are not quite as serious as the problems above. A heavy deer population can wipe out a planting by browsing in the first year, so that is total failure. However, later browsing and antler rub are a major set-back, but are usually not fatal to the plant. Deer fencing can be installed before planting (even trainers will need protection). Before we learned about fencing, we used tree tubes for deer protection. Occasionally a buck can get a tree tube off and do his business. When the young trees reach about 1 inch diameter, we take off the tree tubes and use spiral wraps to ward off antler rub. The spiral wraps are rub-proof, but no use regarding browsing. We have reused these items many times. The bucks don't seem interested in trees above about 4 inches in diameter, and thankfully they prefer other species to black walnut for their sparring practice. For the beer can scheme, see John Ouellette's comment at the end of Chapter 15.

Frost Cracks:

Frost cracks are a rather rare event. Many plantations never suffer the problem. Many (maybe 100 out of 3000) of our early plantation trees suffered frost cracks. Tom Jones' plantation (9 miles away) has a bit worse experience than ours, but still only about 5%. We have many undamaged trees to choose from for crop trees. We should never choose a cracked tree for a crop tree. The wood is sound above the crack, but in old age such a tree will surely end up a hollow tree. I believe all our damage and Tom's damage occurred on the same winter night in 2008.

I'm not exactly sure of the physics involved, but one needed condition is a bright sunny day with snow on the ground. The reflected light gives the stem a double dose of sunshine and sap flow. Then a cold night freezes everything and bursts the tree – usually on the south face. The crack goes clear to the pith and there is also a star of (spider) cracks radiating from the center. Frost cracks never heal, bacteria and fungi have access, and completely ruin the lower stem value up to the height of the crack. In other words, farewell to the most valuable log in the tree, the butt log.



The reason that frost cracks never heal is shown below. Scar tissue bridges the crack during the growing season, but is torn apart each winter during bitter cold weather.



A frost crack tissue bridged over in the summer.

The frost Crack reopened at +8 deg. F.

Fruit growers paint a white mix to protect their trees from a bright winter sun. Any form of shade will accomplish the same purpose. Conifer trainers easily provide enough shade, and we have never seen a frost crack in our white pine trained plots. As with antler rub, the risk seems to fade at around a 4 inch diameter, once the bark naturally fractures into vertical ridges. I did find a new crack on a 10 inch tree once.

Since the event is rare and the number of trees involved is a small percentage of an overstocked planting, it is not worth painting tree trunks.

Black Walnut Canker: (not Thousand Canker Disease)

In our travels, we see an occasional black walnut with the symptoms. The first sign is large cankers on the trunk and large limbs, which if severe can cause tree death. Surviving trees respond with profuse sprouting and contorted growth of new tissue throughout the tree for many years.



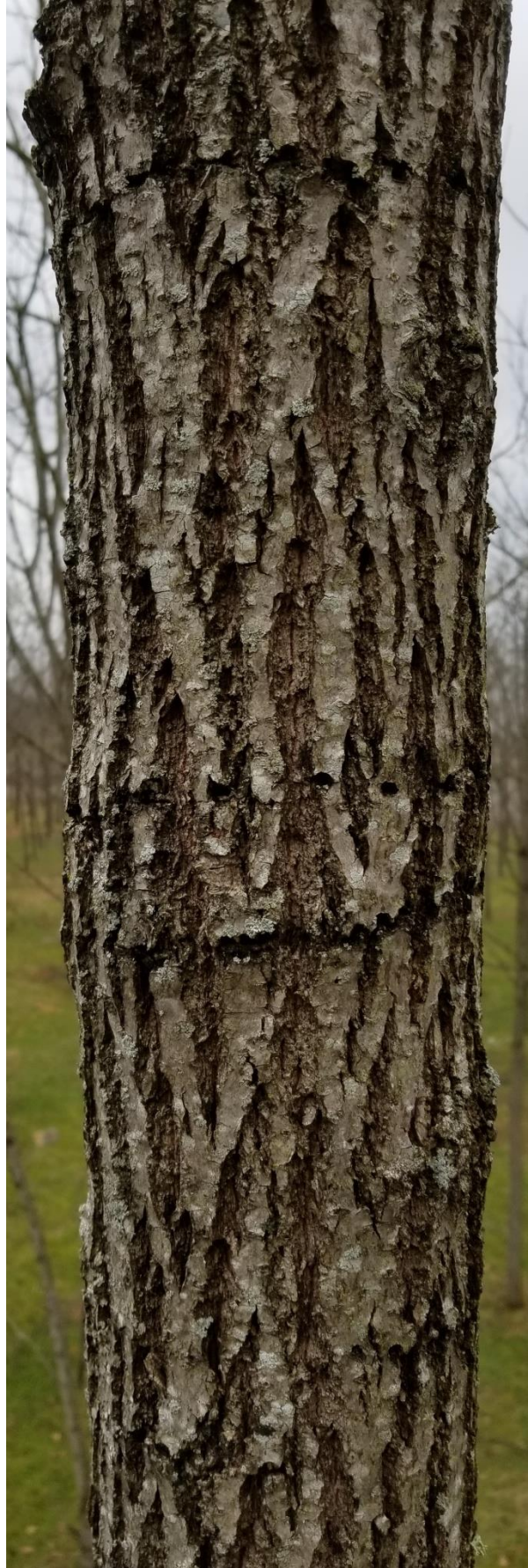
A black walnut canker survivor many years after being infected. Survivors seem to have crooked and compact growth

Believing in the old adage “The time to prune is when your knife is sharp”, we pruned a riverside plot in mid-summer. This was a mistake. About 1/3 of the trees died, 1/3 survived and became contorted (as shown above), and 1/3 were unaffected. Our plot was not completely wiped out, but many trees were lost that would have been chosen as crop trees. Now, if we prune during hot weather, we squirt the wounds with fungicide (2% Clorox).

This may only be a problem for the southern half of the black walnut natural range. Northern growers luckily don't know what we are talking about. The wicked combination seems to be 90 degree F. weather, 100% humidity, and freshly opened wounds. As an additional observation, we have been unsuccessful with many attempts at coppicing. The new sprouts often start out with the same contorted growth and soon wither.

Bird Pecks

Bird pecks are produced by the feeding habit of the yellow bellied sapsucker (*Sphyrapicus varius*), and are a serious problem to the black walnut veneer industry. After years of new bark growth and weathering, the outward signs become only visible to the most astute veneer buyers, but the internal defects in the wood remain. Bird pecks are unacceptable in veneer, and an unpleasant surprise at the veneer slicer.



The sapsuckers peck a horizontal line of small holes getting a tree to bleed which later attracts insects for their dining pleasure. Bacteria and fungi enter the cambium via these wounds, and discoloration and decay spread. Large attacks involve a large part of an annual ring, which may become separated – ring shake.

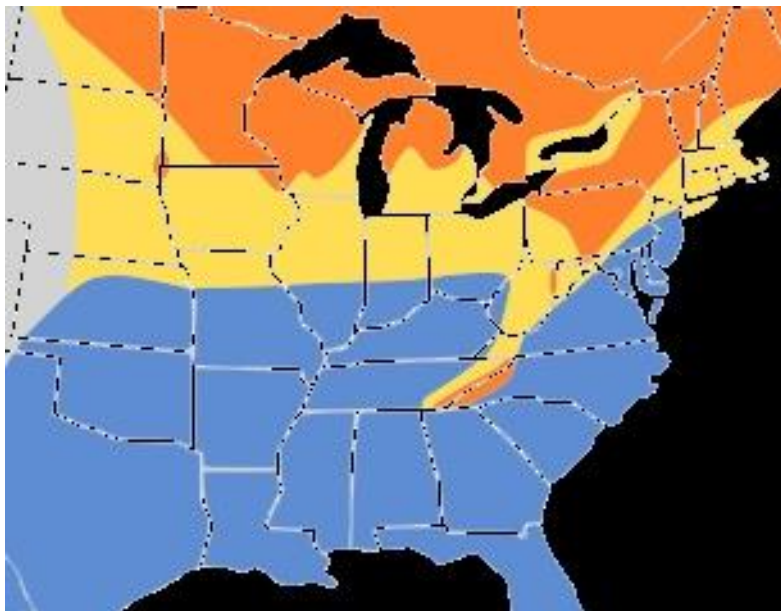
Luckily for us black walnut growers, these birds prefer other tree species (maple, poplar) better than black walnut - clever - softer bark - more sap sugar - more insects.



As shown in cross-section below, on older walnut the birds attack between the bark ridges – a shorter path to the cambium. Microbes enter and spread like a miniature fairy ring. Callas tissue closes over the wounds, and makes a little bump over each wound between the bark ridges. Along with the bark, these little bumps are pushed outward by many years of annual growth, but are still visible to the sharp-eyed veneer buyer, who will never purchase such a log.



The occurrence of bird peck varies geographically, and from experience, black walnut veneer buyers have learned to buy in some areas and avoid others. Trees bleed on sunny days in the winter, and sapsuckers are in the blue map region, below in the winter. There may be other issues, but black walnut veneer buyers have long preferred material from the yellow region where these birds are only transients.



Orange Breeding Yellow Migration Blue Nonbreeding

Sites (like ours) in the blue region have a problem. I have no solution, but you might want to leak the word out that these birds are delicious. I have noticed that they have their favorite trees and leave most alone. My current theory is to save the damaged sacrificial trees to protect the majority.

Here are some pictures from Cornell University Ornithology, who would be appalled at what you are thinking, but might inadvertently be helpful. On a sunny winter day the whole tree may become wet with sap below a line of these wounds.



Yellow bellied sapsucker (male)

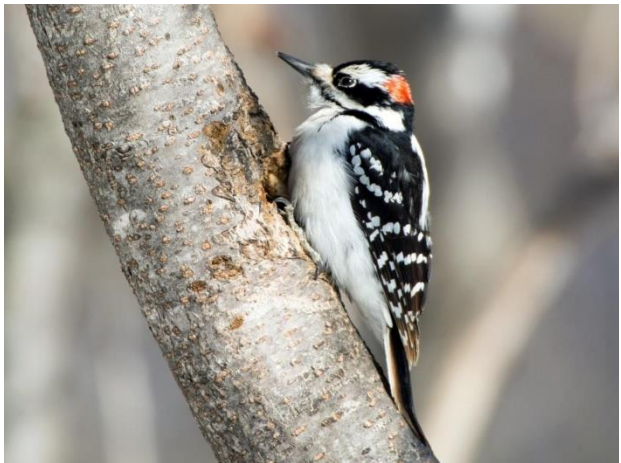


Yellow bellied sapsucker (female)

The yellow bellied villain (whose belly isn't very yellow) has a white bar on the wings and a speckled back, while the innocents below have just the opposite.



Downy (male)



Hairy (male)

Walnut Anthracnose

Lastly, we have come to the least offensive of black walnut problems. Walnut anthracnose is a fungal disease that causes brown leaf spots and premature fall defoliation. This appearance looks alarming, but has not been shown to affect tree growth. Some individual trees show resistance (see photo), but tree breeders are not interested without some associated increase in commercial value. Grower Hugh Pence has noticed that Anthracnose resistant trees seem to be among top 10 or 20 percent for size. Of course, that leaves the question: Are big trees anthracnose resistant, or does anthracnose resistance cause big trees. If you really want to know, I'm sure Hugh would welcome you in October to check his 44,000 tree plantation.





Co-dominant Crotch

When veneer buyers evaluate a tree's veneer length, they start at stump-level and work their way up the bole. When they come to a crotch or large branch the show is over. They won't even stop to look at a tree with a branch below 8 feet. So branches can cause total failure for our objective #1.

I have noticed in mature crowns that any branch whose foliage is not reaching into the canopy eventually fails. So, sharply upward branches have better survival than branches coming off the trunk near 90 degrees, but both are bad if they survive. In our conifer trained planting, I see very few large horizontal limbs, and those are always dead – widow makers

Sawyers like 90 degree branches, because they have no trapped bark. Pruners like 90 degree branches because they can be removed without injuring the branch collar. Woodpeckers and squirrels like large 90 degree branches because they die and create cavities. Veneer buyers hate any branch or even any trace of a branch. Logger 's wives hate large 90 degree branches. Because of shading, mature trees in forests no longer have live 90 degree branches below their crowns.

I see a few nearly codominant crotches, which may occur at any level. This is one kind of branch that the trainer trees have trouble shading out. These codominant crotches limit the possible veneer volume that could be produced. They could have been easily corrected if I had been present, attentive, and could have penetrated the thicket with a pole saw.

Mainly because of trapped bark and the associated mechanical weakness, tree breeders give genetic points to trees with less acute branch angles. A co-dominant branch crown is really a hideous choice while selecting crop trees. During wind storms they sometimes split down to the ground.

The number one objective of manual pruning is to remove any co-dominant crotch