



In this grove, black walnuts trees stunt growth of vegetation beneath

Detective Games

Black walnut is a study in plant defenses- and offers clue to past land use.

Often on our walks we get clues to past uses of properties. Some are more obvious than others: we see foundations from homesteads, or a standing silo that offers evidence of a farm.

Vegetation can also offer insight into past habitation. On the Natural Land's Eagle Trail there is a stand of black walnuts. These trees were traditionally planted by long-gone homesteaders for their allelopathic properties. Allelopathy is the chemical inhibition of one plant (or other organism) by another, due to the release into the environment of substances acting as germination or growth inhibitors. So when you stroll through a grove of black walnuts you notice that it is somewhat

lacking in other vegetation. A number of plants do not grow near these trees because of a non-toxic, colorless chemical called hydrojuglone. The chemical is in its leaves, stems, nut hulls, bark, and roots. When exposed to air or soil compounds, hydrojuglone is oxidized into allelochemical juglone, which is highly toxic (VA Tech, Cooperative Extension). After a hard day of working in the field, if colonists planted black walnut near the house they didn't have to mow the yard to be aware of possible unwanted visitors, animal or human. And the tree had other benefits as well. The wood makes excellent furniture, provides formidable shade, and edible nuts. The nuts are a challenge to crack but make a great cake or torte.

English walnuts, hickories, and pecans also produce juglone but in smaller quantities. Some other well-known trees have allelopathic qualities: tree-of-heaven, hackberries, southern wax myrtle, cottonwood, black cherry, red oak, black locust, sassafras, and American elm and sycamore (VA Tech). Trees can also emit chemicals that enhance other trees' growth, and in 1996 botanists extended the meaning of allelopathy to include both negative and positive chemical effects, but by and large people normally use the term to indicate adverse qualities. There are long lists of plants that are tolerant of

juglone and ones that are damaged by its effects.

There are numerous other plants with self-defense systems; their chemical compounds may not involve juglone but other byproducts. The agricultural industry studies these inhibitors to produce chemical agents to suppress weeds. For instance Callisto™, a synthetic herbicide/preemergent, was inspired by mesotrione, which is found in the bottlebrush plant (*Callistemon citrinus*). Neonicotinoids or neonics are chemical insecticides resembling plant-based nicotine, and are used to repel insects from crops. Unfortunately their effects are thought to be linked to declining bee populations. This is the subject of numerous studies because neonics are being heavily employed. Since bees pollinate our crops, the use of neonicotinoids is likely self-defeating.

The benefits and ill effects of the great many synthetic compounds used in farming are continually under debate and review. Sadly, final safety determinations are usually made only after prolonged usage, when the substance has already found its way into our water supply and the food chain.

Some other plants well-known for their allelopathic qualities are sumac, bearberry, rhododendron, elderberry,

forsythia, goldenrod, some ferns, perennial rye, tall fescue, Kentucky bluegrass, and garlic mustard. Most plants are not totally exclusive and may live in harmony with some species and not others.

So back to clues to past uses. A number of plants are indicative of former colonization, especially the presence of “old country favorites” brought by Europeans. Bouncing bet or soapwort was brought and used for its detergent properties. Numerous plants were introduced to the Americas because of their medicinal qualities, especially herbs. Angelica, oregano, horehound, sage, hyssop, rosemary, and lavender are all European transplants. Angelica has been used for everything from digestive issues to plague. If you read a list of applications for horehound you might decide that you’ll never need anything else to cure your woes. According to webmd.com, white horehound is used for “digestion problems including loss of appetite, indigestion, bloating, gas, diarrhea, constipation, and liver and gallbladder complaints. It is also used for lung and breathing problems including cough, whooping cough, asthma, tuberculosis, bronchitis, and swollen breathing passages.” Today it is employed in numerous medicinal products such as cough syrups, expectorants, food flavorings, and to treat jaundice, to kill

parasitic worms, and to increase urine production.

For plants and their medicinal properties the internet will make your eyes roll back in your head until you drop over. Which also seems self-defeating to me. But if you insist on exploration, which could also prove interesting, one of my associates suggests Dr. Duke's Phytochemical and Ethnobotanical Databases, a website hosted by the US Dept. of Agriculture.

Since daffodils are native to Europe and Northern Africa, when we see them in a forested area or on a preserve we can guess that a homestead was once present. Lilacs are another tell-tale planting. Sometimes we will find evidence of foundation fragments in close association with these.

We often see other exotic species that were introduced by people on their property but linger on in preserved areas. These aggressive plants often take over. Clearly the darker side of beauty is wisteria: lovely and deadly. Then there's English ivy - and more English ivy - and yes, more. And don't get me started on bamboo; here is what I have to say about it: "Just don't." Don't buy it, don't gift it, don't use it. You will likely never get rid of it if you do.

Trees planted in rows and seeming to be of similar age are also signs of the presence of human hands; they don't happen in a natural environment.

The next time you're on a trail, try playing detective and see if you can discover any past uses of a property!