Trees and Lawns: Can't We Just Get Along?

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Dr. Roberts retired from Michigan State University in 2018 after committing four decades to advancing MSU's Land Grant Mission, originally signed into law by President Abraham Lincoln during the midst of the American Civil War. He has published hundreds of articles and has taught hundreds of lectures and workshops.

Dr. Roberts has researched many issues in Michigan's plant industry, including Oak Wilt, Dutch Elm Disease, Diplodia Tip Blight of Pines, along with a variety of cultural problems such as plant nutrition and herbicide toxicity. During his career, he has discovered a variety of new diseases and pests such as Phomopsis Canker of Spruce and the first bacterial wilt disease of turfgrasses in North America.

In the early 2000s, his research on Ash Decline in Southeast Michigan led to the discovery of the invasive Emerald Ash Borer in North America.

In his retirement, Dr. Roberts intends to remain active with the Arboriculture/Landscape/Nursery industries. Dr. Roberts is President, CEO and CBW (Chief Bottle Washer) of The Plant Doctor, LLC…aka The Tree Doctor.

Introduction:

Quality lawns are generally highly sought after by homeowners and commercial property owners. Unfortunately, trees and lawns do not peacefully coexist; they are constantly competing with one another in their effort for survival and advantage, whether that competition is for water, nutrients and sunlight (in the case of turf). Allelopathy, defined as production of toxic chemicals by plants to inhibit other plants, may also occasionally be involved in that competition. A well-known example of Allelopathy is juglone secreted by Walnut.

his ever-present struggle between turf and trees is completely natural; it is Mother Nature's way, and she resolved this issue long ago with the establishment of forests or woodlands and grasslands or prairies. Humans persistently attempt to overcome this natural ecosystem in contemporary landscapes. Our constant striving for that perfect lawn has caused numerous psychological disorders in humans and may even contribute to marital breakups, ranking near the top with money issues and extramarital affairs. In modern landscapes we expect a lush, dense lawn, whether in the sun or shade, right up to the trunks of trees. Our preoccupation with this lawn culture consists initially with the sodding or seeding of a new lawn, followed by maintenance applications of lawn herbicides for weed control, fertilizers that favor turfgrass growth, and abundant irrigation, among other inputs. This lawn culture eventually leads to an increased soil pH, which favors a bacterial-based soil food web, favoring lawn grasses over trees. The pursuit of high quality lawns frequently leads to the decline, and possibly even death, of trees (Photo 1).

If trees are favored over lawn culture or if landscapes progress "naturally", lawns either cannot become established or they die out (Photo 2). In Mother Nature's Ecological Progression, trees create and adapt to an acidic soil pH and an accompanying fungi-based (not bacteria) soil food web. So, in landscapes, how do we balance the health of lawn grasses and the health of trees? If we lack consideration, lawns vs. trees becomes a long term conflict in which arborists, landscapers, turfgrass managers and the public are in frequent turmoil. Lawncare professionals are expected to create and maintain a lush, dense, weed-free lawn…often to the detriment of tree health.

1 This multi-century old Oak tree in Bloomfield Hills, Michigan gradually declined over a period of years. The likely cause of the not uncommon decline was probably the intense turfgrass culture. Not shown in this photo, on the right was a "House For Sale" sign, an indication that human ownership and human generations are transient compared to trees.

2 This massive Willow Oak has thus far prevailed in the struggle with the surrounding lawn. Note the bare areas beneath the Oak where it competitively outperformed turfgrass, and even weeds. Establishing a lawn beneath the tree would prove very challenging if not almost impossible without seriously harming the tree. That includes aggressive pruning to allow sunlight penetration. This tree is a great candidate for a large mulch ring (thin in depth) extending to at least the drip line.

3A **3**B& **3**C The best way to promote trees in lieu of turf culture is to keep turf away from trees and their roots. The establishment of large mulch rings on this Oak in lower Michigan (3A) and on this large beech tree on a golf course in Northern Michigan (3B) is an excellent cultural practice to simulate the natural forest environment and promote tree health. Even rock mulch (3C) will prevent injury from mowers and hopefully keep lawn chemicals at a distance.

Arborists are charged with promoting the health and longevity of trees…rarely minding the lawn. Following are some alternative propositions that may be considered for specific landscapes to resolve this often-brutal competition between trees and turfgrass lawns.

Mulch "Rings"

The best way to obtain optimal health for trees is to simulate forest conditions. Afterall, that's how Mother Nature programmed trees over the millennia. In forest environments, leaves, twigs and branches fall to the forest floor every year and decompose. With time the soil pH decreases (acidifies), and a fungal-based soil food web favored by the lower soil pH along with mycorrhizae and billions of other microbes creates a rich "black dirt" high in organic matter. The most efficient manner to simulate this natural condition in our modern-day, highly maintained and somewhat "artificial" landscape is the creation of large mulch rings around trees (Photos 3A & 3B). Optimally, a relatively thin layer of mulch extending from the trunk of the tree to at least the drip line simulates that forest floor better than lawn grasses and is very beneficial to trees. ***The larger the mulched area around trees the better.*** If a large mulch ring is not practical, just keeping turf and associated maintenance materials such as herbicides, alkaline-forming fertilizers and lawn mowers away from trees can be helpful (Photo 3C). Weed management in mulched areas can readily be accomplished by physical removal or by careful application of herbicides - herbicides that are unlikely to be absorbed by tree roots and epicormic shoots. It is well-advised to never use a herbicide product that contains Imazapyr/Imazapic in the vicinity of tree roots; these herbicides can seriously harm if not kill trees. A large mulch ring is the best option in resolving the competition between lawn grasses and trees. It is important to note that the roots of a tree may extend 1½ - 2x the height of said tree. A large mulch ring mimics Mother Nature's forest environment and provides a tree in the landscape with a fighting chance in its effort to compete with a highly maintained lawn.

Sodding or Turfgrass Reseeding

For shaded or partly shaded areas where grasses are hesitant to grow, occasional reseeding may be helpful. It is not uncommon that reseeding of lawns may be required at least every spring and fall beneath large, old trees (perhaps more often). It would be wise to select shade tolerant mixes of turfgrass; these may include cultivars of shade tolerant ryegrass, fescue and bluegrass, etc. We as humans are sometimes gullible and fall for those "As Seen On TV" advertisements, where it may "only" cost $49.95 to reseed a 12-square foot area of barren landscape with the miracle "SuperHumdinger" variety of lawn seed that was "scientifically proven" to grow a lush lawn anywhere, even on cement and coal strip-mined land. "But wait, there's more!" Trial and error experimentation is sometimes recommended to determine what works best for specific landscapes and their tree population. It is not unusual for people to experience different results with the same variety of turf mix in shaded conditions.

Pruning

If a lawn is necessary beneath trees in specific landscape situations, tree pruning may provide a better environment for maintaining a healthy lawn (Photos 4 & 5). Two pruning techniques, "limbing up" and "thinning", may allow more light into the area and help promote the possibility of a healthy, robust turfgrass lawn beneath trees. However, inappropriate pruning may cause serious consequences to the health and viability of trees if not done properly (Photo 6). Many trees are poorly pruned by so-called "experts" who have little knowledge about pruning. Anyone can prune trees, right?

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4 Removing the lower branches, a practice known as "Limbing Up", may help promote turf growth beneath trees and allow ease of maintenance such as mowing as well as golf ball retrieval.

5 This large, 4-foot diameter at breast height (dbh) Red Oak in Northern Michigan was limbed up and severely thinned to promote sunlight penetration to the ground beneath it, thereby hoping to promote a more dense, healthy lawn. Aggressive pruning that cleans out the inner and lower branches of trees is sometimes described as "Lion's Tailing". Drastic procedures such as aggressive pruning can jeopardize the health of trees by increasing the chances of pest/disease attack.

6 Improper pruning or pruning branches that are large may lead to slow wound healing and severe internal decay, eventually resulting in tree hazard conditions and a drastically shorter life for the tree.

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Improper pruning can result in slow wound healing and internal decay, both of which can potentially cause serious structural problems (Photo 6) and/or shorten the life of trees. Large, grand old trees may become hazardous to people/property and will probably experience a much shorter lifespan if they are improperly pruned. It is important to understand that trees should only be pruned by professionals who possess the knowledge and experience in this "art". And, pruning should only be done on an as-needed basis. Proper pruning can be time-consuming and, hence, costly…requiring an expertise, which many "experts" don't possess despite their "professional" claims. Also, pruning should not occur just because it may be deemed a scheduled maintenance procedure analogous to a "haircut" for people.

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Perennials/Ground Covers

The propagation of shade tolerant perennials and/or ground covers provides a reasonable alternative to lawn grasses in shady areas where we have difficulty establishing and maintaining lawns (Photos 7 & 8). Ground covers and vines such as English Ivy, Pachysandra and Vinca (Periwinkle) are relatively shade tolerant; they are also quite aggressive. While some ground cover plants such as English Ivy are sometimes considered to be "invasive" by some individuals, they are nevertheless very efficient at performing their intended function - growing in locations where turfgrass is unlikely to thrive. In some situations, groundcovers may become quite competitive with trees (Photos 9A, 9B & 9C). Aggressive efforts may occasionally be needed to contain specific ground covers to their desired location; some ground covers may initiate "living girdling ropes" around the base of trees or on a tree's branches (Photo 9C), which can be detrimental to the health of a tree. Specific perennials such as Vinca (Periwinkle) may flower at certain times of the year while providing a lush, green undergrowth the balance of the year (Photo 8). Shrubs and small trees that are shade tolerant may provide options other than turfgrass beneath trees (Photos 10 and 11). I tend to not recommend annual plants under trees (Photo 12) because frequent soil disturbance for replanting annuals will harm roots of trees and may predispose them to lethal root or lower trunk infections, possibly resulting in tree decline and death.

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7 Shade tolerant perennial plants and/or ground covers can substitute very nicely for turfgrass in low light conditions beneath trees. English Ivy can be invasive in shady areas. Although very aggressive, English Ivy nevertheless does its duty very admirably as a ground cover.

8 Vinca, a.k.a. Periwinkle, is a wonderful understory ground cover that grows in very low light conditions and needs little maintenance while also being very effective at suppressing weed growth. Purplish-lavender flowers bloom for extended periods in the spring (Inset).

9A 9B& 9C This large Maple tree (Photo 9A) serves as a focal point in a circular drive at an estate in southeast Michigan; it exhibited symptoms of severe decline several years ago: stunted, yellowing foliage and dieback (Inset). The Pachysandra had been established beneath the tree 40-50 years ago. Because of extreme restrictions around the tree's trunk and in the vicinity of its roots, the Pachysandra was carefully removed to hopefully alleviate the stress on the tree. Over several decades, the Pachysandra had developed a mass of roots and stems approximately 2 feet deep; removal proved to be a daunting task. Subsequently, a new soil mixture was distributed beneath the tree and Pachysandra was replanted for historical reasons. Within 1-2 years after the removal of the dense mat of girdling Pachysandra, the tree exhibited remarkable recovery (Photo 9B) to the joyfulness of the property owners. Ground covers sometimes need to be restricted; English Ivy (Photo 9C) has completely colonized this large Silver Maple to its top branches. The ivy may eventually cause decline, even strangulation, with its living ropes and weight.

10& 11 Shade tolerant woody shrubs such as Azaleas and Rhododendrons can provide great alternatives to lawns beneath trees (Photo 10). Small, shade tolerant trees such as these Redbuds (Photo 11) in the author's front yard can serve as replacement for lawns, possessing the bonus of requiring less mowing. Yeah!

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Do Nothing

Doing nothing is sometimes a viable solution to poor quality turf under trees. Many property owners have accepted this option, which saves significant sums of money and reduces undue stress from worry about having a perfect lawn and "keeping up with the Joneses" (Photo 13).

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Prioritizing Trees and Turf

In highly maintained landscapes, many individuals are only focused on how good the lawn appears. We have a tendency to ignore large trees because they have lived there for generations, need little care and will be there for many decades to come. Trees don't need attention or care, right? We spend thousands of dollars per annum on lawn mowing and other inputs to maintain a healthy lawn, often without spending a nickel on our trees. A serious threat to trees is the application of lawn herbicides in the vicinity of their roots. Because lawn herbicides are designed to kill broadleaf weeds and because most trees are considered "broadleaf" plants, herbicides applied on lawns can have a detrimental effect on trees. Such detrimental effects will often not be manifested conspicuously (Photo 14 and Inset) but may result in an overall decline over time, possibly even contributing to a tree's death. Ironically, in cases of tree neglect, property owners may conclude that a tree is simply old and has reached the end of its life. Or people simply do not understand the impact of the turf culture upon their trees. In many cases of neglect and eventual tree decline, once people realize their tree(s) might be dying, they are often willing to spend almost any amount of money to resurrect their lovely landmark tree, often when it is too late and the tree is beyond salvage. In many landscape situations, trees are better off with lawns around them (Photos 15 & 16).

It is interesting that a lawn can be replaced in a few days to a couple of weeks whereas trees cannot be replaced in several decades or even 100-300 or so years (Photos 1, 2 & 15). I think it is important to also understand that a tree in a landscape may be valued at several tens of thousands of dollars, ***individually***. Although a nice appearing lawn is an enviable thing for keeping up with our neighbors, in my opinion, trees need to be given prioritization over lawns for the enjoyment of many generations in the decades and centuries yet to come.

12 Annual plants are often installed to augment the beauty of many landscapes. Because annuals require soil disturbance for planting, sometimes even several times per year in highly maintained areas, I am disinclined to recommend annuals (or frequent replanting/soil disturbance) in the vicinity of trees. Periodic wounding of tree roots and lower trunk/root collar tissues can predispose trees to root and collar rot diseases, which can then lead to decline and death of trees.

13 The property owners of this large Silver Maple near their home in Monroe, Michigan loved the tree and the shade it provided, thereby giving the tree its proper priority in their universe. They were not concerned about a lawn beneath the tree…or even other understory plants, simply allowing what may survive in that environment to grow.

14 Lawn herbicides often do not cause an immediate, obvious decline in trees. Herbicide impacts may be more subtle and chronic (but detrimental long-term) as revealed on this large Oak at a funeral home in Traverse City, Michigan. Note cupping and distortion of foliage (Inset) caused by the broadleaf weed herbicides, 2,4-D and dicamba. The astute property owners noted the odd, thinning foliage before severe decline set in and asked the lawncare company to cease the frequent, broad-spectrum applications of the herbicides.

15 This massive Cottonwood in Leland, Michigan was considered a tourist attraction, admired by many people whenever they visited the region. Unfortunately, because the tree was surrounded by pavement, sidewalks and buildings, it gradually declined and occasionally dropped limbs onto this public thoroughfare. It was deemed hazardous and eventually removed due to liability reasons. Would it have survived better in a lawn environment?

16 City trees, like city residents, often live in restrictive areas. This tree will likely decrease in annual growth and development. Perhaps even situated in a lawn/landscape would probably be better for its long-term survival and health.

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