

THE PURDUE LANDSCAPE REPORT

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Top Arborvitae Aggravations

(Tom Creswell, creswell@purdue.edu)



Transplant Stress

Arborvitae varieties (*Thuja spp.*) provide some of our most beautiful and versatile evergreens for landscapes, with an extensive selection of sizes and types. Unless they get proper care, they also give us some frustrating failures. Here is my list of the most frequently encountered 'Arborvitae Aggravations', based on the samples and questions we get in the PPDL; in no particular order.

1. Transplant stress: Transplant stress is a normal result of planting or moving any tree or large shrub but it is frequently more serious for conifers like arborvitae. If the plant has dried out at any point before transplant the stress and browning of foliage will be much worse. Don't keep root systems soggy wet but do make sure they stay evenly moist until planting. During the first summer be especially vigilant about watering. Keep soil evenly moist and make sure water penetrates into the full root zone. After establishment irrigation should only be needed during extended dry spells.
2. Small root ball: This is a contributor to transplant stress

and poor survival. For balled and burlapped (B&B) plants consider whether the root system is large enough to support the amount of top growth before purchasing plants. For container grown plants check to see whether the root system has filled the current container. If the outer edge of the container is just loose media then the root ball you are getting actually has considerable less volume than the pot size. This usually happens when field grown plants are recently dug and potted up. Plants with too small root systems may survive but they will struggle to produce new roots and will require much more attention.

3. Planting too deeply/drowning: The goal in setting the planting depth is to replicate how the tree or shrub would look if grew in the site from a small seedling or cutting. Planting at the same depth as found in the nursery is the usual recommendation but sometimes trees are planted too deeply in the nursery. Adding to that by planting even deeper in the landscape can lead to root death caused by saturated soils and lack of oxygen.

1. 

Planting too deep



Poor positioning

2. Planting too close together: Homeowners, who wanted a

really dense screen rapidly, often plant arborvitae far too close together. As they grow the competition for light, root space, water and nutrients mean the plants suffer. Also allow for final height. This arborvitae probably looked great at the corner of the garage until it grew too tall and had to grow around the eave of the house. Think ahead and space arborvitae wide enough to place properly to allow for their projected mature size and height.

3. Poor soil/site conditions: Avoid planting in sites with very poor, rocky soil and in drought or flood prone sites.
4. Drought stress: Arborvitae need well drained soils but they also need even soil moisture, not an easy balance to achieve in many sites. Irrigate deeply about once a week during extended dry periods to encourage deeper root growth.



Drought Stress



Bagworm

2. Bagworms and Spider mites: These are the most common and serious insect/mite pests of arborvitae. Monitor for bagworms regularly. Bagworm management recommendations: <https://extension.entm.purdue.edu/publications/E-27/E-27.html>. Spider mite management recommendations: <https://extension.entm.purdue.edu/publications/E-42.pdf>



Black Flags

Black leaves (black flags): Arborvitae foliage sometimes turns black in small areas, for no apparent reason. We have searched for insects, diseases and abiotic causes related to this with many clinic samples and have never found a specific cause. Physical injury seems to be the most likely cause but can't usually be confirmed. The good news is that the black discoloration rarely spreads and should just be pruned out.

Disease problems are infrequent but we occasionally see fungal diebacks caused by *Botryosphaeria*, *Sphaeropsis*, *Phyllosticta* and *Diplodia*. These fungi tend to attack wounded or stressed plants so good care is the best defense. The only treatment is to prune out dead stems since fungicide applications are not effective.

In the right site with proper planting and good care arborvitae will reward you with many years of beauty.

So Long Suckers!

(Rosie Lerner, rosie@purdue.edu)

Some landscape plants produce vigorous, upright stems that become troublesome as they out compete better-formed branches and shade out the rest of the plant. These remarkably fast growing, upright stems are called "suckers" if they come from the root system, and "watersprouts" if they originate from other stems.

Ornamental crabapples are among the most notorious producers of these unwanted stems, but many other trees and shrubs can be afflicted, including contorted filbert, peach, apple and dogwood.

While there are a few landscape plants that are supposed to have very upright habits, in most plants, this upright growth results in a weak architecture in addition to causing overcrowding. Limbs with narrow branch angles are more prone to internal decay and breakage during storms.



Suckersprouts



Remove fast growing suckers and watersprouts as soon as possible.

Both suckers and watersprouts can and should be removed any time they occur though it is often easier to see their architecture during the dormant season. The earlier these vigorous shoots are removed, the better, so don't feel you must wait until winter. The succulent growth put on by suckers and watersprouts is often susceptible to attack by fungal pathogens, as well as sap-sucking insects, such as aphids. Keeping after these nuisance stems can be annoying, but better now than after several years of wood being laid down!

Suckers should be removed at or just below the soil line using sharp pruning shears. Watersprouts should be pruned back to just above the collar at their point of origin, avoiding injury to the remaining branch but also being careful to not leave a stub. If removed when they are very young, watersprouts can often be pinched or rubbed off with your gloved thumb.

Did mulch cause apartment fire?

(Kyle Daniel, daniel38@purdue.edu)

On May 2nd an apartment fire in Greenwood occurred that reportedly originated in the mulched landscape beds. Unfortunately 56 renters were displaced that day, but fortunately no injuries were reported. Several Indianapolis news

organizations reported on the origins of the fire that included a couple of quotes that were not entirely accurate.

One of those interviewed stated that the most likely cause of the mulch catching fire was due to a cigarette being discarded, which happens quite often during dry periods and is correct. The quote that stood out was, 'The mulch itself can decompress over time, decompose, and that decomposition can cause a chemical reaction that can actually cause the mulch to catch on fire by itself.' This statement, taken at face value, can make sense to some folks. Think about wet hay catching on fire in a barn, or the mulch fire that occurred in Southern Indiana in April. Organic material can catch fire. The problem with this quote, which was stated on scene of the fire, is that mulch is not going to spontaneously combust when spread in a landscape situation.



A few factors are necessary to be present in order for organic material to start a fire without an outside source (i.e. flame, hot equipment, sparks, lightning strike, etc.). These includes microbes, moisture, carbon and nitrogen, and a large quantity of organic material.

The reason that organic matter (compost) heats up is due to microbial action breaking down the carbon. When composting, the carbon to nitrogen ratio (C:N) is important because if there is not enough nitrogen, the microbes use what's there for their metabolic needs. The C:N of wood mulch is about 400:1. For aerobic (oxygen present) composting (which is the most rapid type of composting), there needs to be a C:N of about 20:1 to 40:1. Based on this ratio alone there would be very little breakdown of the wood chips, especially wood chips that were just applied to the landscape.

Moisture also needs to be present for composting to occur. Microbes prefer the moisture to be between about 40-70% to effectively break down the carbon. Since central Indiana was in a minor drought, the moisture content wouldn't be close to 40%. One of the reasons that mulch makes for an effective weed control tool is due to the fact the mulch makes a dry layer between the soil and air. Weed seeds can't germinate in a dry area.



Typically mulch is spread in a landscape around three inches, but can be spread as thick as five inches. Rarely, if ever, will mulch in a landscape be more than five inches. Six, seven, even ten inches isn't enough quantity to start a fire. Some say that 15 inches is around the minimum for enough microbial action to start a fire. This is certainly not the case in a landscape.

Mulching with wood chips provides many benefits for the landscape, both seen and unseen. We typically think of the aesthetics of mulch, but that is just one benefit. Other benefits include weed control (reduced pesticide usage), improved soil health, root zone temperature moderation, and moisture retention. Strictly from a plant health standpoint, organic mulch is vital. We can debate the aesthetics all day: natural vs. black vs. red vs.....

So, to circle back, did the fire start because the microbes in the mulch produced enough heat to start a fire? The simple answer is most certainly not. Cigarettes that aren't fully extinguished and are thrown in the mulch is the most likely source of the fire. For multi-family housing, it's important to have proper receptacles to prevent the likelihood of fire via mulch.

Refernece:

Cooperband, L. 2002. The art and science of composting. University of Wisconsin Madison Center for Integrated Agricultural Systems. 17 pgs.

Spotlight on Weeds: Broadleaf plantain (*Plantago major*)

(Aaron Patton), (Leslie Beck) & (Kyle Daniel, daniel38@purdue.edu)

Biology: Broadleaf plantain (*Plantago major*) is a perennial, broadleaf weed that can be found in nutrient-poor soils; however, they prefer nutrient rich-soils that are moist and often high in calcium. Broadleaf plantain is a common weed in turfgrass, nurseries, and landscapes. It germinates from seed in late spring

through mid-to-late summer and occasionally in the fall depending on temperature and moisture. It has a low growing rosette habit and tolerates close mow

ng. It's ability to survive a range of environments make broadleaf plantain a common weed in North America.



Figure 1. Broadleaf plantain as a rosette.. Photo by Aaron Patton

Identification: Broadleaf plantain is anchored primarily by fibrous roots. Some describe the root system as having a central, short taproot with branched-out fibrous roots but my experience is that large, fibrous roots are common and that taproots (especially large taproots like a dandelion) are very uncommon. Broadleaf plantain grows with a rosette habit with leaves that can grow flat along the turfgrass canopy or more erect and upright depending on cultural control methods. The plant produces leaves that form on long, broad leaf-stems (petioles) that may grow up to six inches long and four inches wide when left unmown or untreated. Young leaves are oval to egg-shaped, generally have 3-5 prominent veins, and are light green in color. As the plant matures, the leaves start to appear darker green, can be smooth or slightly hairy, and abruptly narrowing to the petiole (leaf stalk). Very prominent leaf veins run parallel to the margin and appear to originate from the attachment point at the petiole. Leaf margins are smooth (entire) and appear more crinkled and wavy as the plant matures. Though the leaves can appear waxy and dark- to bluish-green, the petioles often have a reddish color towards their base, or the origin point of the rosette. Broadleaf plantain can produce flowers from June through September on long, leafless flower-stalks that arise from the center of the rosette. Small, whitish petals emerge from the flower-stalk where seeds are produced in an oval-shaped capsule which can contain up to 30 viable seeds. It may often be confused with blackseed plantain (*Plantago rugelii*) which is similar in appearance. Additionally, it is thought that many plants characterized as broadleaf plantain may in fact be natural crosses between *Plantago major* and *Plantago rugelii*.



Figure 2. Broadleaf plantain. Photo by Aaron Patton

Cultural control: The primary cultural control methods include mulching and cultivation. Since its primary method of dispersal is through seed, control or removal of the plant prior to seed production could reduce the spread of this weed by depleting the weed seed bank. Broadleaf plantain thrives in compacted soils, moist or dry soils, and shady conditions. Some research suggests as well that this plant prefers high calcium soils, but high calcium soils are a common phenomenon in North American because the soil parent material is limestone. Plants can be removed by hand-weeding if there are only a few on the property.



Figure 3. Broadleaf plantain. Photo by Aaron Patton

Biological control: None known specifically for broadleaf plantain. Many new organic products contain the active ingredient iron HEDTA (FeHEDTA). Multiple applications of this product are required for control. The efficacy for weed control via biological control is yet to be well documented.

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Chemical control:

Preemergence:

Preemergence herbicides are the recommended method for controlling henbit in nurseries and landscapes. Preemergence herbicides will reduce risks of phytotoxicity, reduce the total amount of herbicides applied, and reduce labor inputs. The herbicide must be applied PRIOR to germination for control. A fall application of preemergence herbicide is necessary to control henbit. See table 1 for preemergence herbicides that are labeled on ornamentals for controlling henbit.

Gallery	<u>Isoxaben</u>
Marengo	<u>indaziflam</u>
Showcase	<u>trifluralin + isoxaben + oxyfluorfen</u>
Snapshot	<u>trifluralin + isoxaben</u>
Specticle	<u>indaziflam</u>
Sureguard	<u>flumioxazin</u>

Table 1. Labeled preemergence herbicides for broadleaf plantain control.

Postemergence:

Postemergence herbicides may be used when escapes occur with the preemergence application. Glyphosate works well on henbit, but be cautious when applying around the ornamental plants in the nursery or landscape. See Table 2 for labeled postemergence herbicides that are effective on henbit.

Roundup	<u>glyphosate</u>
Finale	<u>glufosinate</u>

Table 2. Postemergence herbicides for broadleaf plantain control.

References:

Neal, J. C., Derr, J., Marble, C., and Senesac, A. 2017. Nursery and Landscape Weed Control. Southeastern US Pest Control Guide for Nursery Crops and Landscape Plantings. 9 pgs.