

THE PURDUE LANDSCAPE REPORT

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Purdue Turf and Landscape Field Day: A unique educational experience for the Green Industry

(Kyle Daniel, daniel38@purdue.edu)

Last Tuesday, July 9th, we held our annual Purdue Turf and Landscape Field Day. The weather could not have been more ideal for a July day in Indiana. The morning started out with 23 dozen donuts, and gallons of coffee, at 9:00 am. After opening remarks, the groups broke up into the various tracks, which included the landscape, lawn, and golf groups. The field day included 443 attendees, 38 vendors, four sponsors, and over 20 volunteers in attendance for a great day of hands-on education.



The morning landscape program included:

- John Bonkowski speaking about boxwood blight in the landscape.
- Lindsey Purcell teaching tree risk assessment.
- Cliff Sadof discussing the most prolific pests this year, including treatment options.

- Kyle Daniel demonstrating a research trial that examined weed control using phenological cues to time preemergence herbicides.
- Fred Whitford leading a discussion on what happens after a car accident for your company.
- Joe Becovitz giving an update on what the Office of the Indiana State Chemist is seeing thus far in 2019.



After a great lunch, which included 575 pork chops, 720 bottles of water, 720 cans of lemonade, and 375 pre-scooped ice cream cups, the landscape group travelled a mile down the road to Horticulture Park on the far west side of campus. John, Lindsey, Cliff, Rosie, and Kyle led a walk-about at Hort Park where various insects, disease, and abiotic disorders were discussed on many different species. The attendees enjoyed the opportunity to learn real world problems in a hands-on environment.

Be sure to mark your calendars for next year's field day on July 14th, 2020!



Business and Marketing Practices of U.S. Landscape Firms

(Kyle Daniel, daniel38@purdue.edu)

Our Green Industry team is fortunate to have an economist, Dr. Ariana Torres, as part of our group. In addition to her business and marketing background, she also has experience in the greenhouse and floriculture industry, as well as a grower for several years. She's been developing programs and publishing in scientific journals about the Green Industry, including this paper examining the business and marketing practices of landscape firms across the U.S. A brief description of the results and a link to the article are included below.



Little information has been published on the business and marketing practices of landscape firms, an important sector of the green industry. We profiled the product mix, advertising, marketing, and other business practices of United States landscape firms and compare them by business type (landscape only, landscape/retail, and landscape/retail/grower) as well as by firm size. Herbaceous perennials, shade trees, deciduous shrubs, and flowering bedding plants together accounted for half of all landscape sales; 3/4 of all products were sold in containers. Landscape businesses diversified their sales methods as they diversified their businesses to include production and retail functions. Landscape businesses spent, on average, 5.6% of sales on advertising, yet large landscape companies spent two to three times the percentage of sales on advertising compared with small- and medium-sized firms. The top three factors influencing price establishment in landscape businesses were plant grade, market demand, and uniqueness of plants, whereas inflation was ranked as the least important of the nine factors provided.

<https://journals.ashs.org/horttech/view/journals/horttech/27/6/article-p884.pdf>

Are my trees safe?

(Lindsey Purcell, lapurcel@purdue.edu)

Recently, there was another tragic accident at a camp involving a tree failure in which people were severely injured and one girl died from the results of this tree falling in a storm. We frequently hear about tree issues involving damage to vehicles or homes often causing people to be injured, or worse.



The benefits of trees far outweigh the risks involved with trees.

Tree care professionals are frequently asked, "is my tree safe?" It could literally be a million-dollar question and one that should not be taken lightly or answered without due diligence to protect the tree owner. The simple answer is no. Every tree has a risk of failure, but the benefits of trees far exceed the risks.

We need trees for our health and quality of life. Trees provide a wide variety of benefits which include shade, cleaner air and water, carbon sequestration, and sociological benefits. These benefits increase as the age and size of the trees increase. However, as trees get older and larger, they may become more likely to shed branches or develop decay or other conditions that can increase the likelihood for failure.

It is impossible to maintain trees free of all risk; some level of risk must be accepted to experience the benefits that trees provide. The risk to humans is extremely low; according to statistics, there is a 1 in 20 million chance of being injured by a tree falling. However, because tree owners have a legal duty of care, it is the responsibility of the owner to be aware of the condition of their trees on their property.



Tree failures are often predictable and preventable.



Broken branches can occur at any time during severe storms even on healthy trees.

Landowners often become more aware of tree issues and risk situations after a weather event such as windstorm, ice or flooding. It is natural for trees to lose branches during storms, even on healthy trees. However, many of the tree failures, either whole tree or in part are predictable and often times, preventable.

Regular assessments during the year, especially after a weather event helps to identify risk issues. Also, regular inspections for health to determine if the tree is predisposed to branch failure or windthrow is prudent to help reduce the likelihood of failure. During an inspection, if a tree presents a situation where there is a suspected increased risk of failure, it is the tree's owner who must make the decision about whether that risk is unacceptable. However, if you are unable to make an informed decision, it would be advised to consult a qualified arborist.

Generally speaking, the law obligates landowners to periodically inspect their property and take reasonable care to maintain it so as to not pose a risk of harm to others. As a result, if they fail to identify and mitigate dead or dangerous trees and harm results, they can be held liable for that harm. However, property owners are not responsible for the unforeseeable results of storms or other weather events, if the trees appear healthy. The term "Acts of God" relate to events outside human control and may limit or eliminate liability for injuries or loss.



A qualified arborist can help determine the health of your trees.

Landowners and homeowners should take precautions to reduce the potential for harm on their properties. It is wise to carry insurance coverage and to have your trees periodically inspected by a certified arborist or consulting arborist, especially if you believe your trees may be at risk of failure. Regular tree inspections help to reduce risk and keep them vigorous and growing to make our world greener, happier and healthier.

Find a certified arborist;

<https://www.treesaregood.org/findanarborist>

Find a consulting arborist;

<https://www.asca-consultants.org/search/custom.asp?id=3818>

Trees and Storms, FNR-FAQ-12-W;

https://mdc.itap.purdue.edu/item.asp?Item_Number=FNR-FAQ-12-W

Root Rot

(Janna Beckerman, janna@purdue.edu)

"We never look deeply into the quality of a tree; we never really touch it, feel its solidity, its rough bark, and hear the sound that is part of the tree. Not the sound of wind through the leaves, not the

breeze of a morning that flutters the leaves, but its own sound, the sound of the trunk and the silent sound of the roots." Jiddu Krishnamurti



Figure 1. Root rot, coupled with strong winds, resulted in the failure of this tree.

When appreciating the beauty of trees (or any plant, for that matter!), we often overlook what goes on underground—the roots. The major function of the root is to anchor the plant to the soil, and to absorb water and nutrients for the plant. Unfortunately, the roots are rarely observed in their entirety even though the structure of the root system profoundly impacts plant health above-ground. As a result, root problems are frequently under- and misdiagnosed. Until it is too late (Fig. 1).

Unusually wet weather results in poor root growth, predisposing plants to problems. Simply stated, the plant failed to develop an extensive root system because water was too easily acquired. During these periods of excessive moisture, roots may even leak, attracting opportunistic fungi and water molds that infect and rot roots. These infections may be completely asymptomatic in the aboveground portion of the plant until spring and summer rains change into summer heat, dry spells or drought. The poorly developed and/or infected roots that grew during the wet periods can no longer support the aboveground plant (stems, branches, leaves) in dry times. As the leaves and branches start to die, they produce less food (photosynthate) for the roots. As the roots starve, they are unable to provide the water needed for photosynthesis. After this process has progressed for a few weeks, vague symptoms develop and include slow(er) growth, decline in crown, smaller leaves that may or may not be chlorotic, heavier seed crops, and the simple description "It just doesn't look good."



Figure 2. White pine showing symptoms of nutrient deficiency due to *Phytophthora* root rot.

As this decline progresses, secondary insects and opportunistic fungi attack these plants, and are often blamed for the overall poor health (Fig. 2). At this point, a 'negative feedback loop' where dying leaves fail to support dying roots can result in plant death, unless some type of equilibrium can be achieved and the

loop is aborted. Plant death results in the plant not being able to take up sufficient water or nutrients to support the branch, leaf, flowers, or fruit development.

Other symptoms of root death to note include:

ABOVE GROUND

- Slower growth compared to healthy plants. Shoot length is reduced compared to healthy neighbors, or there are even scattered dead shoots (Fig. 3).
- Leaves turn yellow and wilt.
- Leaf scorch describes when the margin of leaves turn brown (Fig. 4).
- Small shoots to large side branches are dying or dead
- Cankering and dieback of shoots, branches and stem contributes to dieback and death.



Figure 3. Evidence of decline can be seen when comparing leaf and short growth from previous year to current year.



Figure 4. Hackberry with leaf scorch. Photo by Dr. Greg Shaner.

Whenever possible, carefully excavate roots, and wash them. Often times, this requires extensive sampling because 100% of the root area is rarely infected. Using a hand trowel and/or small shovel, remove multiple ~ 1-cup samples of that includes soil, larger woody roots and small feeder roots from at least three locations around the tree. This should be performed from at least three sides of the affected tree. Store samples in a plastic bag, preferably in a cooler with ice to keep from drying out. Samples should include areas within the dripline, by the main stem, and somewhere in between. Any suspicious areas (crown rot, mushrooms, conks, fruiting bodies) should be included in the sampling.

We regularly deploy a mason jar with a mesh screen instead of a lid to clean roots under running water while not losing root material. Examine the roots for signs of rot that include a lack of root hairs, poor root growth, or yellow, brown or blackened roots. Always make sure you know what normal roots look like when examining roots! Keep in mind that some plants, like azalea and rhododendron, have dark roots, others may be colonized by

mycorrhizae or nitrogen-fixing bacteria.

BELOW GROUND

- Roots appear water-soaked, discolored (brown or black); lack of small roots. Always make sure you know what normal roots look like when examining roots (Fig. 5,6)!



Figure 5. Comparing healthy to rotted roots.



Figure 6. Washed roots showing evidence of rot.

Unfortunately, examining the roots for established woody plants, particularly trees and shrubs, is difficult, and may not be possible in all situations without the help of a tree care professional. After removing the soil from the base of the tree, evaluate whether any of the following problems are involved:



Figure 7. Trunk girdling roots. Photo by PPDL

- Excessive mulch
- Planted too deeply or shallowly
- Significant root or root flare damage
- Stem girdling, or root girdling root (Fig 7. 17-01281 Maple_02)
- Few main roots or roots on only one side of tree or shrub
- Insect or animal feeding damage
- Root rot
- Galls

The primary causal agents of woody plant root disease are fungi like *Armillaria*, *Thielaviopsis* and *Fusarium* (to name but a few!), and the 'water molds' from the genera *Phytophthora* and

Pythium. Although very different organisms, they are all able to survive on dead and dying tissue. Some of these fungi are opportunists, attacking those plants suffering from poor site, drought, flooding, or other abiotic disorders commonly found in the urban landscape, whereas others are virulent primary pathogens that can attack an otherwise healthy host.

A diagnosis of the root rot is necessary to develop a good management plan, including the right fungicide, good cultural controls, and what other nearby plants may be susceptible. Like many things, it is more easily said than done. Diagnosing a root rot requires capturing the infected tissue at the right time to culture out the pathogen or pathogens causing the problem.

Prevention is the best approach to managing root rots. If using plants that are known hosts for root rots (i.e., azalea, beech, pieris, rhododendron, for *Phytophthora*; oak for *Armillaria*, etc.), avoid setting the plant up for failure. For *Phytophthora* susceptible plants, avoid heavy clay, poorly draining soil and low spots that collect water. For *Armillaria*, remove any stumps completely via grinding and avoid planting new trees in the same spot where trees have died.

Some root rots (e.g., caused by *Phytophthora*) are treatable, if caught and diagnosed early enough, or better still, treated prophylactically. It is possible for the plant to compartmentalize and outgrow root damage, although there are many factors that make successful treatment of plant diseases challenging. Factors that impact successful treatment include the type of host plant, its susceptibility to the pathogen, its vigor and overall health, the site, and the type of pathogen. Remember that damage occurred over several seasons, and recovery may take just as long, even under the best of circumstances.

In some instances, saving a tree or shrub simply isn't possible or cost effective. Often times, cutting losses involves a chainsaw. Plants can often be replaced with an identical clone of what was lost, or with something more disease resistant or even completely different, thereby avoiding future problems, and hopefully achieving a newer, healthier tree to enjoy, leaves, bark, and roots!

NewGen Boxwood

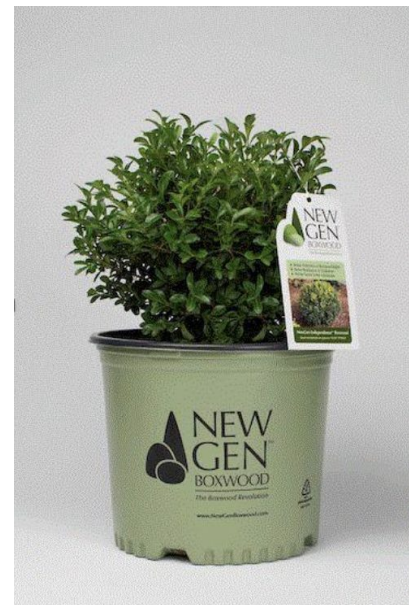
(Janna Beckerman, janna@purdue.edu)

From Matthew Chappell, UGA

NewGen Boxwood, marketed by Saunders Genetics, LLC, will unveil the first two introductions in its groundbreaking boxwood program at Cultivate'19. The two exclusive varieties will be available in the marketplace beginning early 2020. The

revolutionary aspect of the brand-new introductions is reflected in the given names—Buxus NewGen Independence and Buxus NewGen Freedom. “We’re excited to be able to offer these introductions to the industry and consumers,” says Bennett Saunders, General Manager of Saunders Genetics. “The discovery of boxwood blight in 2011 and the spread of leafminer before that signaled a need to raise the bar in boxwood genetics. After these initial years of work, we think we’re on the track to a new era for boxwood.”

NewGen Independence is a very deep green medium-sized boxwood that holds its rich color all winter. It performs best in Zones 5b-8, with further testing underway. With a medium growth rate, Independence will mature as a 3 ft. rounded shrub in 15 years. It performs well in sun, part sun and shade. Strong branching withstands moderate to heavy snows. Recommended uses would be in formal plantings where a medium-sized plant is desired, including as a replacement for English boxwood in foundation plantings.



NewGen Independence Red is one of two new Buxus introductions from the new(ish) Saunders Genetics, LLC.

NewGen Freedom is a relatively vigorous rounded cultivar, slightly taller than it is wide. With a fast growth rate of 3 to 5 inches per year, at maturity (in 15 years) it will reach a size of 4.5 ft. (height) by 4 ft. (wide). Freedom performs best in Zones 5-8, with further testing underway. It performs well in sun, part sun and shade. Beautiful glossy green foliage paired with a uniform and tight habit make it an excellent choice for more formal and residential landscapes as a medium specimen, hedge or foundation plant.

The Saunders folks have created a [VIDEO](#) that tells the details of how these varieties came about. Give it a view—it's compelling stuff!

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