COOPERATIVE EXTENSION SERVICE
HOME, YARD & GARDEN PEST NEWSLETTER
College of Agricultural, Consumer and Environmental Sciences, University of Illinois at Urbana - Champaign
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Boxwood Blight Special Screening Service

Boxwood Blight is an exotic fungal disease which can infect members of the Buxaceae family. It has been confirmed on boxwood, pachysandra, and sarcococca. It was first described in the United Kingdom in the mid-1990s. Since then, it has been found throughout Europe and in New Zealand. The pathogen was identified for the first time in the United States in 2011. Boxwood blight has now been found in 19 states: AL, CT, DE, FL, GA, MA, MD, MO, NC, NH, NJ, NY, OH, OR, PA, RI, SC, VA, and WV. **To date, this disease has not been found in Illinois.**

It is important to note that, just because the pathogen has been found in a state, that does not mean the pathogen has become established. Boxwood blight moves long-distance on infected nursery stock, and some confirmations have been in nurseries where the infected plants have been destroyed before being sold.

There are three characteristic symptoms of boxwood blight: leaf spots, stem cankers, and defoliation. Common fungal diseases such as Volutella Blight and Macrophoma Leaf Spot, damage from insect pests including Boxwood Leafminer, and abiotic issues such as winter damage are often mistaken for Boxwood Blight.

Leaf Spots

Spots start off as light or dark brown circular areas on leaves, usually with a yellow halo. As the spots increase in size, the entire leaf becomes blighted. If the infection starts near the leaf margin, a wedge-shaped lesion may develop. Lesions are usually visible on both sides of the leaf.

Stem Cankers

Dark brown or black, diamond-shaped or linear cankers are clearly defined against green stems.

Defoliation

This is a classic symptom of boxwood blight as other boxwood problems do not typically cause defoliation.

Because boxwood blight has the potential to seriously impact Illinois landscapes and nursery production, the University of Illinois Plant Clinic is offering free screening of suspect samples from Illinois in 2016. There is no charge for these samples, but reports for these samples will not be provided. If you would like a full diagnostic report including management recommendations, please submit it as a general sample.

For a copy of the Plant Clinic Special Report and screening submission form, please see: https://uofi.box.com/s/4hnabgy1i7aftjb08sa66nhc1zcyal0l

If you have questions about this service, or about boxwood blight in general, please contact us at (217) 333-0519 or plantclinic@illinois.edu. (*Diane Plewa*)

Diplodia Blight

Austrian pines are showing symptoms of Diplopia (Sphaeropsis) tip bight. This disease is prevalent in Illinois, especially in years when we have lengthy, cool, and wet spring weather. Diplodia is a fungal disease that mainly affects two- or three-needled pine species. White pine, Spruce, fir, Douglas fir, and other evergreen species are also potential hosts, but are less affected by the disease.

The most characteristic symptom is the blighting of all needles at the branch tips. Affected needles are killed mid-development, resulting in a stunted, straw or tan colored appearance. Diseased needles remain attached to the shoots. Diplodia symptoms share similarities to other needle blights and disorders, and may require microscopic observation to confirm the disease. However, for many infections, field diagnosis of Diplodia tip blight can often be achieved by observing the black, pinhead-sized fungal fruiting bodies at the base of blighted needles. Fruiting bodies can also be found on cones and bark tissues. As you are scouting, be aware that the fruiting bodies may not appear on freshly killed shoots, but should appear on shoots killed during the previous spring. Suspect needles can also be placed in a plastic bag for 24 to 48 hours with a damp paper towel to help elicit fruiting bodies.

The fungi that cause Diplodia blight are well known for their ability to take advantage of weakened or stressed plants. On stressed plants, infections may progress from diseased shoots to larger branches, resulting in resinous cankers, death of mature needles, and death of branches.

Cultural controls play an important role in disease management. Diseased branches, branch tips, and cones all contribute to future infections. To reduce disease inoculum, prune and remove any dead wood, diseased branches, needles and cones. To reduce the spread of the disease, prune only when foliage is dry. Sterilize pruners with 10% household bleach or 70% rubbing alcohol, especially before pruning healthy pine trees. Prune diseased branches 6 to 8 inches below the point where they are obviously infected. Alleviate any stress to affected pine trees. This should include mulching and watering during periods of drought.

Fungicide won't be beneficial at this point, but can applied next spring to help protect developing needles. Fungicides containing the active ingredients chlorothalonil, copper, mancozeb, myclobutanil propiconazole, or thiophanate-methyl are labeled for use to manage Diplodia Tip Blight. The sprays should be applied three times in a season to achieve good control: when buds begin to swell and elongate, just before the new needles emerge from the sheath, and 10 to 14 days later. For the remainder of this season, concentrate on cultural management options. (*Travis Cleveland*)

Heat Stress

Few people like 90+ degree temperatures. Plants aren't far behind. On hot days, plants can lose water faster than

roots absorb it, even if sufficient soil moisture is available. In these conditions, you can watch the plants wilt, leaves droop, and stems seem to flop. If the soil is moist, the plants start to recover as the sun sets. By morning, they look turgid, only to begin the cycle again when the sun shines hard. This is what we are currently seeing in Illinois.

It's only when the plants consistently lose water faster than they can absorb, and don't recover, that serious issues arise.

Larger leafed and shallow rooted plants are the most affected. An example would be *Hydrangea macrophylla*, the showy blue to pink to purple flowering shrub. Many annual vegetables and flowers also suffer more from heat as the upper soil surfaces dry out faster than those deeper.

Trees and shrubs may wilt, but are more likely to shed leaves. Leaves turn yellow and/or brown, and fall from the tree. Seldom do green leaves just drop. Leaf drop occurs throughout the plant, though older leaves and those closer to the trunk seem to be shed first.

Birch (*Betula*), cottonwood and other true poplars (*Populus*), maples (*Acer*) and tuliptree/yellow poplar (*Liriodendron*) commonly drop large amounts of chlorotic-looking leaves, though less if plants are watered heavily during the hot periods. Typically, this occurs with lowland trees or those trees who natural habitat tends to be near streams, rivers or floodplains. This is a defense mechanism by these plants to lessen the water stress on the entire plant. The tree's canopy may look thinned in severe conditions.

Some woody ornamentals start exhibiting autumn colors. Red maples (*Acer rubrum*) and burning bushes (*Euonymus alatus*) may show hints of red but leaves remain attached.

Many of the warm-season vegetables will flower, but flowers abort with no resulting fruit production. This is common on tomatoes and peppers.

Corn and tomatoes develop leaf roll, where the edges of the leaves roll inward or downward as a means of reducing water loss from the plant's stomata. As temperatures cool, the leaves generally resume their normal shape.

Another condition associated with excess temperatures is **scorch**. Leaves of many trees and shrubs turn brown on the edges and progress toward the veins, or turn brown between the veins. With scorch, the symptoms tend to be consistent throughout the plant, though it's possible more damage may be exhibited on those sides experiencing excessive heat from paved hardscapes such as driveways, streets, sidewalks and parking lots that can radiate the heat back toward the plant, or sides of the plants with root damage or restriction. Scorch can also be exacerbated by dry soil or droughts.

Annual and perennial flowers may be smaller and colors may fade quickly. Flower longevity may also be shortened in high temperatures, even with sufficient moisture.

Cool-season turfgrasses such as Kentucky bluegrass, bentgrass, perennial ryegrass and the fescues enter dormancy, with a gradual yellowing and then browning of the leaves. If you peel back the dead leaves, the crowns usually are still green. However, heat stress on lawns may allow diseases to invade.

Long, slow, deep waterings are the best for preventing heat stress, preferably in the morning when water loss from evaporation is less. Water at the driplines of trees and shrubs, not at their trunk. Water slowly so there is no run-off, and the water slowly permeates into the soil with the goal of wetting the ground to a depth of 8 to 12 inches. This may mean keeping sprinklers on for 60 to 120 minutes.

Shallow and frequent waterings, such as turning on the irrigation system or sprinklers for 15 minutes every day, only keeps roots close to the surface, resulting in their drying out in the heat. (*David Robson*)

Strawberry Root Weevil

Unexplained notches eaten out of the foliage and flower petals of rose, daisy, black-eyed Susan, aster, trumpet creeper, strawberry, and other plants may be caused by adult strawberry root weevils.

Strawberry root weevils are smaller relatives of black vine weevil, causing similar damage to a wider array of plant species. The adults are hard-shelled, blunt-snouted weevils about one-quarter inch long. Those that have newly emerged from pupae are brown and slowly turn black. They have no spots or other distinguishing markings. Like black vine weevils, they emerge at this time of year and are long-lived, with some entering houses and surviving through the winter.

Adults feed on many plant species, eating small to large notches in leaves and flower petals during the night. They can commonly be found still feeding in the early daylight hours. Most spend the day in debris beneath the plants, but a few can be found hiding between petals of compound roses and other flowers. They are all females and cannot fly. They lay eggs after feeding for a few days when their ovaries have matured.

Eggs hatch into larvae that are legless, whitish, and curved with brown heads. Mature larvae are about one-quarter inch long. They feed on the roots of many plant species, preferring strawberries, conifers, and other ornamental plants. Root-feeding on strawberries can be damaging but is not severely damaging to other, larger plants. In late spring, they pupate, emerging as adults.

Adults are controlled with acephate (Orthene), acetamiprid (TriStar), or bifenthrin (Onyx). Spray the foliage to runoff, allowing penetration into mulch and debris beneath the plants where the adults spend the day. Do not spray blossoms to reduce impact on pollinators. Treat soon after damage is noticed to not only avoid more damage but also to eliminate the beetles before they can lay eggs.

Larval control is not typically feasible in the landscape or nursery due to the large variety of plants that function as larval hosts. If larval hosts are identified, *Heterorhabditis bacteriophora* and other insecticidal nematodes have been shown to be effective. (*Phil Nixon*)

Horsehair Worm

Horsehair worms are being found in mud puddles and road ruts after rains. They are very slender, whitish to dark brown, nematode-like worms usually four to seven inches long. These are

adult worms that have emerged from their insect hosts to reproduce. Male and female worms shed their gametes (sperm and eggs) into the water where fertilization takes place.

Fertilized eggs hatch into infective larvae that are aquatic like their parents. These larvae find their way into crickets, grasshoppers, or cockroaches by means that are not understood. It is assumed that the larvae are ingested while these terrestrial insects are drinking, but these insects primarily obtain their moisture from their food and dew, where the infective larvae are unlikely to be found.

The larvae feed inside the insect, maturing into adult worms. Adult worms are large enough compared to the size of the host insect that they fill most of interior of the insect when fully grown. When ready to emerge, the adult worm somehow causes the dying host to plunge itself into water, an action that would likely cause the terrestrial insect to drown. The adult horsehair worm then emerges into the water to reproduce.

Horsehair worm adults are named due to their being common in horse water troughs and being similar in size and color to the hair of horses. These are one-host parasitic worms and are thus not a threat to humans or other mammals or birds. They are related to nematodes but are in their own phylum, Nematomorpha. Their only close relatives parasitize hermit crabs in marine environments. (*Phil Nixon*)

Herbicide Drift

The weather is finally warm (almost hot) and the planters are rolling full speed across central Illinois. Gardens are being planted as well. Planting preparation in farm fields often includes the use of herbicides to kill off any unwanted weeds that have set up residence this spring. Invasive species and other miscellaneous weeds in non-crop areas are being sprayed as well. 'Tis the season for much growth, and much death of plants. We humans are kind of funny like that.

Speaking of death, the curled, yellowed, and necrotic spotted leaves have started to arrive at the U of I Plant Clinic. Puzzle pieces then have to be put together to determine if nearby pesticide (often herbicide) applications are possibly to blame for the injured plants that are dead, yellowed, curled, etc. Of course environmental conditions, diseases, and insect problems can mimic these symptoms which makes a proper diagnosis especially challenging.

Couple this with all the different herbicides and various plants we have gracing our Illinois landscape and things can get complicated quickly. Then factor in the unknowns such as not knowing when a neighbor sprayed, what they sprayed or even if they sprayed.

The process has been likened by us as being "CSI for Plants". We are easily entertained you think, but at least we are enthusiastic about what we do. "CSI – Urbana". I like that.

Prevention of this unwanted pesticide injury to your plants is certainly important. It makes things the easiest for all involved. The reality is that pesticide applications are going to happen across Illinois this summer. Producers, landscapers, and others have crops, lawns, and other investments to protect from weeds, insects, and diseases.

If you are a grower of a sensitive crop, build good relations with your neighbors and ask them for advance notice when they spray. By law and depending on the type of application, they may not be required to give you notice. But, most are willing to provide this information if asked. Most applicators will do everything possible to prevent off target movement of pesticides. However, wind gusts and sudden changes in wind direction can occur. Talking with your neighbors is the FIRST step towards preventing drift. Applicators, please do everything in your power to keep your applications on target.

A helpful publication on this topic is "Reducing Pesticide Drift: Specialty Crops and Conventional Crops as Good Neighbors". It can be viewed at: https://my-s.extension.uiuc.edu/documents/960111006110611/reducingdrift.pdf. Also available is an online training module that includes information and helpful tips on preventing and dealing with the off-target movement of herbicide applications. "Herbicide Tolerant Crop Stewardship" is available for free at: http://web.extension.illinois.edu/psep/articulate/htcs/

Additionally, if you have a particularly sensitive crop or area that must be protected from pesticide drift, let neighboring applicators know about it. Commercial crop producers can register their sites at http://Driftwatch.org (part of FieldWatch, Inc.), which is an online registry designed to help pesticide applicators, specialty crop growers, and stewards of at-risk habitats communicate more effectively to protect pesticide-sensitive areas. Sensitive crop areas registered on this site include beehives, certified organic crops, fruits, grapes, nursery crops, pumpkins, melons, tomatoes, and vegetables.

If apparent herbicide damage is present, the applicator and owner should meet to talk about the injury symptoms being shown and what possible causes there are. Consider when the symptoms first appeared and when the application was made.

What pesticide was applied? Is there a pattern to the injury? Are many species showing symptoms or is it only one plant in a group of similar plants? What have the weather conditions been and what were they like at the time of application? Is the applicator willing to pay for damages or replace dead plants? It is often faster, easier, and cheaper to settle these disputes without legal involvement.

Compare what you are seeing to other plants. What does herbicide injury look like on landscape plants? Check out some pictures at http://urbanext.illinois.edu/hortanswers. Search by problem and then type in "herbicide". The pictures were the result of some U of I demonstration plots.

You can send affected plant samples to the University of Illinois Plant Clinic. For information on how to do so, go to http://web.extension.illinois.edu/plantclinic/. Be sure to include as much relevant information as possible. Keep in mind that the Plant Clinic does not perform pesticide residue tests, and without such tests, the cause of a symptom cannot be attributed to pesticide drift with 100% certainty. However, it is possible for Clinic staff and specialists to rule out other possible causes and establish whether the likely cause is drift.

If you choose to file a complaint with IDA, time is of the essence. The pesticide drift complaint process is started by calling IDA's Bureau of Environmental Programs at 1-800-641-3934 (voice and TDD) or 217-785-2427 for a complaint form.

Complaint forms must be received by IDA within 30 days of the incident or within 30 days of when the damage was first noticed. Complaints filed after that will be kept on record, but no administrative action can be taken.

Once a complaint is filed with the department, a field inspector is assigned the case. In most cases, the inspector will interview the complainant and inspect the site. Various types of samples, such as plants, water, or soil, may be collected for analysis at an approved laboratory.

The inspector may also interview applicators in the area, examine pesticide records and collect weather data in an attempt to determine the nature and cause of the damage. The field investigator will then submit a report to the Department for review.

Both parties will receive written notification if the Department finds a violation and takes an enforcement action. Penalties range from advisory or warning letters to monetary penalties of $750 to $10,000, depending on the type and severity of the violation. Penalties are determined through a point system defined in the Illinois Pesticide Act.

Even if a violation of the Illinois Pesticide Act cannot be substantiated, both the complainant and the alleged violator will be notified in writing of the complaint's status. Remember, the Department's role in pesticide misuse incidents is limited to determining whether a violation has occurred. IDA cannot help complainants recover damages.

The degree to which the plant is affected depends on several factors: the type and amount of chemical applied, the time of year, the growth stage of the plant, overall health of the plant, etc .

The healthier the plant is (adequate moisture and light) the more likely it is to survive. Although adding fertilizer is typically helpful to a stressed plant, fertilizer can also stimulate growth, which can further increase the appearance of abnormal growth caused by certain herbicides.

For more drift resources, check out the University of Illinois Pesticide Safety Education website at: http://www.pesticidesafety.illinois.edu. (*Michelle Wiesbrook*)

Modified Growing Degree Days (Base 50°F, March 1 through June 16)

Station Location	Actual Total	Historical Average (11 year)	One- Week Projection	Two-Week Projection
Freeport	900	739	1054	1210
St. Charles	848	696	994	1143
DeKalb	935	796	1094	1253
Monmouth	1076	860	1234	1393
Peoria	1077	906	1242	1410
Champaign	1093	936	1263	1436
Springfield	1235	1020	1411	1591
Perry	1197	951	1359	1524
Brownstown	1170	1092	1348	1531
Belleville	1431	1113	1602	1783
Rend Lake	1422	1208	1606	1796
Carbondale	1334	1143	1506	1682
Dixon Springs	1337	1212	1511	1691

Insect development is temperature dependent. We can use degree days to help predict insect emergence and activity.

Home, Yard, and Garden readers can use the links below with the degree day accumulations above to determine what insect pests could be active in their area.
GDD of Landscape Pests
GDD of Conifer Pests

Degree day accumulations calculated using the Illinois IPM Degree-Day Calculator (a project by the Department of Crop Sciences at the University of Illinois and the Illinois Water Survey).
(*Kelly Estes*)