Kentucky Nursery LISTSERV Bulletin

University of Kentucky Nursery Crops Team

End of July 2016

Long Range Outlook Information

The NOAA is forecasting normal/average precipitation for August, September, and October. However, in keeping with the trend of this year, the prediction calls for higher temperatures over that same three month period across all of North America, including Kentucky. NASA's Goddard Institute for Space Studies reports *each of the first six months of 2016 set a record* as the warmest respective month globally in the modern temperature record, which dates to 1880. If you're feeling the heat out there, you're not alone.

See **UKAg Weather's Long Range Outlooks** for a variety of forecasts of temperature and precipitation probabilities.

Nursery Crops Team

Winston Dunwell
Extension Professor
270.365.7541 x209

Dewayne Ingram
Extension Professor
859.257.8903

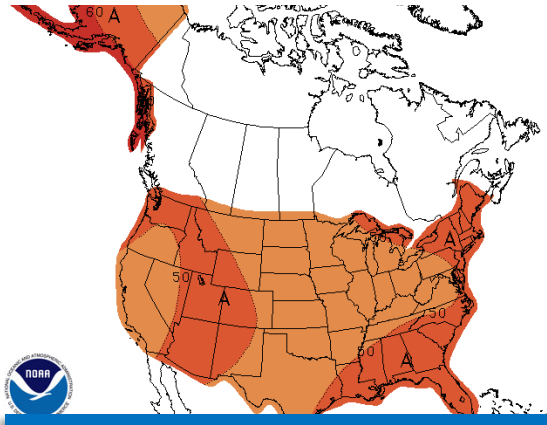
Zenaida Viloria
Extension Associate
270.365.7541 x279

Carey Grable
Extension Associate
270.348.1494

Joshua Knight
Extension Associate
859.257.1273

https://nursery-crop-extension.ca.uky.edu/

Joshua Knight, Editor



Three-Month (Aug, Sept, Oct) Outlook, Temperature probability, Image: NOAA

Spruce Dieback—Needle Cast Diseases May Be To Blame

Kim Leonberger, Extension Associate, Plant Pathology
Nicole Ward-Gauthier, Extension Specialist, Plant Pathology

Blue spruce and Norway spruce are popular landscape plants in Kentucky. However, many factors can cause spruce trees to cast (shed) needles. Casting may be the result of environmental stresses (heavy soil, poor drainage) or fungal diseases. In Kentucky, Rhizosphaera needle cast is the most common disease of spruce. This disease causes needle drop on lower branches, resulting in a distinct thinned appearance. Stigmina needle cast is a less common disease of spruce, but also causes symptoms similar to Rhizosphaera needle cast. Management options for both diseases include reduction of plant stress, good sanitation practices, and timely use of fungicides.

Figure 1. Needles infected with *Rhizosphaera* turn purplish brown during summer.

Photo: Julie Beale, University of Kentucky

Rhizosphaera and Stigmina Needle Cast Facts:

- Symptoms become evident in summer when needles on lower branches turn purplish or brown (Figure 1). Needles fall within a few weeks and lower limbs are left bare (Figure 2).
- In order to determine whether Rhizosphaera or Stigmina needle cast is present, infected needles should be inspected with a hand lens. Look closely for the type of fungal fruiting body emerging from stomata (pores in needles) to confirm diagnosis.
  Rhizosphaera needle cast - Small, dark fruiting bodies (pycnidia) appear as tiny raised, grayish bumps topped with white waxy caps (Figure 3). While most easily recognized with a hand lens, they may also be visible with the naked eye.
  Stigmina needle cast – Fungal fruiting structures (sporodochia) appear as tiny, brown to black, brush-like tufts emerging from needles (Figure 4).

Continued on next page...

Figure 2. Needle drop and thinning of lower canopy are classic symptoms of *Rhizosphaera* needle cast in spruce.

Photo: Minnesota DNR Archive

- Rhizosphaera needle cast is caused by the fungus Rhizosphaera kalkhoffii. Stigmina needle cast is caused by multiple Stigmina species.
- Spread by water splash or wind-driven rain; moisture is needed for infection.
- If defoliation occurs over 3 to 4 consecutive years, branch death is likely.

Figure 3. *Rhizosphaera* pycnidia appear as tiny raised, grayish bumps topped with white, waxy caps.

Photo: Paul Bachi, University of Kentucky

Management Options:

- Stressed trees are more susceptible to infection than healthy plants, so take steps to maintain plant vigor.
- Properly space plants to improve air circulation, thereby encouraging rapid drying of needles.
- Practice good sanitation habits.
- Homeowners can apply fungicides that contain chlorothalonil, copper, or mancozeb during needle emergence (mid-April). During rainy seasons or in plantings with a history of disease, fungicides may be applied 2 consecutive years during spring when fungi are most active.

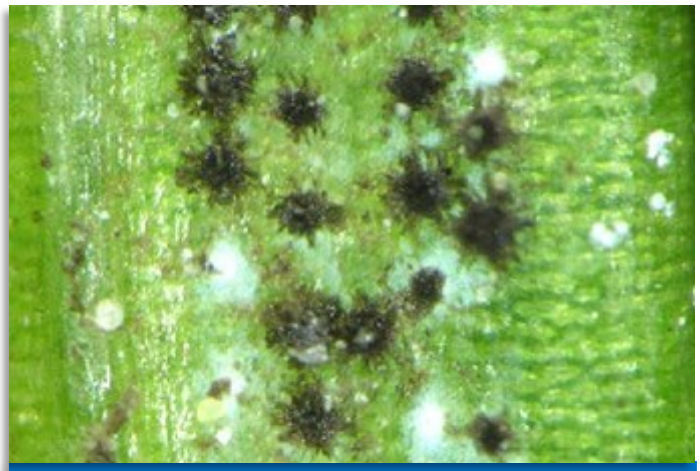


Figure 4. Tiny, brown to black, brush-like tufts emerge from infected needles through stomata of needles infected with *Stigmina*.

Photo: Paul Bachi, University of Kentucky

Additional information

Needle Cast Diseases of Conifers (ID-85)

http://www2.ca.uky.edu/agc/pubs/id/id85/id85.pdf

Homeowner's Guide to Fungicides (PPFS-GEN-07)

http://www2.ca.uky.edu/agcollege/plantpathology/ext_files/PPFShtml/PPFS-GEN-07.pdf

Landscape Sanitation (PPFS-GEN-04)

http://www2.ca.uky.edu/agcollege/plantpathology/ext_files/PPFShtml/PPFS-GEN-04.pdf

Volutella Blight of Boxwood

Kim Leonberger, Extension Associate, Plant Pathology
Nicole Ward Gauthier, Extension Specialist, Plant Pathology

Volutella blight is the most common disease of boxwood in the landscape. Volutella blight is caused by an opportunistic fungal pathogen that attacks leaves and stems of damaged or stressed plants. Winter injury, poor vigor, and wounds increase risk for Volutella blight.

Figure 1. Infected leaves turn from red/bronze to a straw-yellow color.

Photo: Adam Leonberger, University of Kentucky

Volutella Blight Facts

- Leaves begin to turn red or bronze, eventually becoming straw-yellow (Figure 1). Branches die back from the tip and girdling may occur lower on stems (Figure 2). Bark may also be loose on infected branches.
- In moist, humid weather, salmon to pink fruiting structures may be visible (Figure 3).
- American and English boxwood are susceptible.
- Disease development is favored by high humidity and temperatures between 65 and 75°F.
- The pathogen survives winter on affected branches and leaves from the previous season.
- Caused by the fungus *Pseudonectric buxi* (asexual stage – *Volutella buxi*).

Figure 2. Girdling or loose back may be present on lower stems.

Photo: Adam Leonberger, University of Kentucky

Continued on next page...

Management Options

- Maintaining a sanitation program and promoting plant vigor are critical for disease management.
- Prune diseased branches.
- Prevent wounding, including improper pruning cuts.
- Maintain plant health with proper nutrition and irrigation practices. Avoid excess water.
- Maintain good air circulation by sufficiently spacing plants or by pruning dense growth.

Figure 3. Salmon or pink fruiting structures may be visible in periods of moist, humid weather.

Photo: Paul Bachi, University of Kentucky

- Gather and destroy plant debris.
- If disease continues to be a problem after following other management practices, fungicides may be used preventatively beginning in spring. Homeowners may use fungicides that contain mancozeb or copper. ***Always follow label directions when utilizing fungicides.***

Additional Information

Volutella Blight – Boxwood, Home & Garden Information Center – University of Maryland Extension
https://extension.umd.edu/hgic/volutella-blight-boxwood

Boxwood Diseases, Plant Diseases – Penn State Extension
http://extension.psu.edu/pests/plant-diseases/all-fact-sheets/boxwood-diseases

Boxwood (Buxus spp.)-Volutella Leaf and Stem Blight {Canker}, Pacific Northwest Plant Disease Management Handbook
http://pnwhandbooks.org/plantdisease/boxwood-buxus-spp-volutella-leaf-and-stem-blight-canker

Landscape Sanitation (PPFS-GEN-04)
http://www2.ca.uky.edu/agcollege/plantpathology/ext_files/PPFShtml/PPFS-GEN-04.pdf

Homeowner's Guide to Fungicides (PPFS-GEN-07)
http://www2.ca.uky.edu/agcollege/plantpathology/ext_files/PPFShtml/PPFS-GEN-07.pdf

Woody Plant Disease Management Guide for Nurseries and Landscapes (ID-88)
http://www2.ca.uky.edu/agcomm/pubs/id/id88/id88.pdf

Monitoring Irrigation Alkalinity Levels

Carey Grable, Extension Associate, Nursery Crops

We usually come across several nurseries every summer who are finding plants with a variety of strange symptoms. Often times, the source of these issues can be narrowed down to problems with alkalinity. Alkalinity is the metric by which we measure the water's ability to neutralize acids. Water sources high in alkalinity will neutralize available acids causing the pH of the growing substrate to rise over time. A high pH can limit a plant's ability to uptake vital nutrients, leading to stunting and nutrient deficiencies. The Southern Nursery Association's Best Management Practices: Guide for Producing Nursery Crops recommends a substrate pH of 5.5 to 6.5 for most common nursery crops. Plants such as Hollies and Azaleas call for a more acidic substrate with a pH of 4.5 to 5.5. Figure 1. To monitor irrigation water alkalinity, regular water tests should be performed. These tests are available from several sources including your local county Extension office. Figure 2. The Pour-Through Leachate Extraction technique can also help growers get an idea of the current pH of their container grown plants. An example of this procedure can be viewed on the UKRECHort YouTube channel.

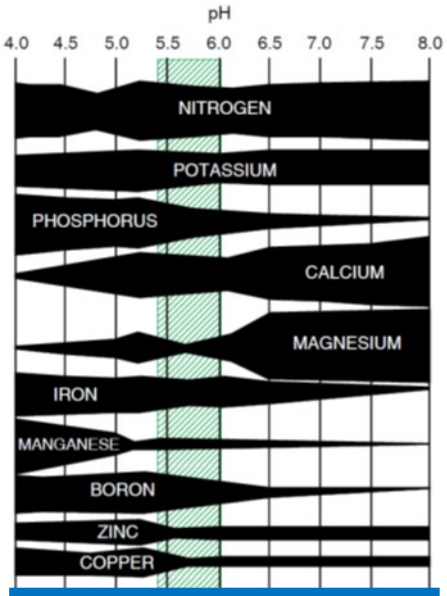


Figure 1. Target pH zone for proper nutrient uptake.

Source: Alkalinity Control for Irrigation Water, NC State Extension

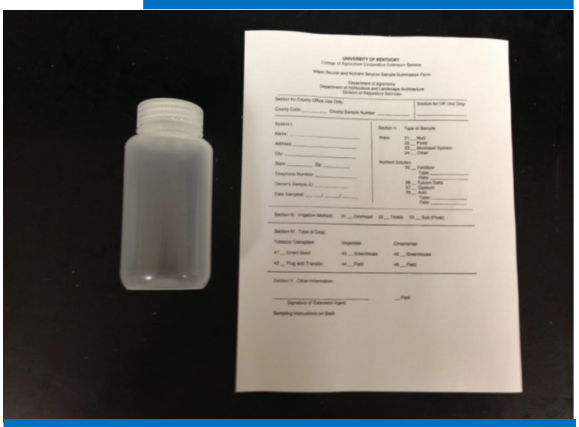


Figure 2. Water Testing supplies.

Photo: Why Test My Irrigation Water, University of Kentucky Horticulture

A couple of options are available to help growers with high alkalinity. For growers with moderate alkalinity issues, some fertilizer blends come in pH modifying formulations. For growers who have an alkalinity of 300ppm or more, acid injection would likely be needed. There are several types of acid that can be used in nursery production, each with their own pros and cons. For more information on pH modifying fertilizers and acid injection, see Alkalinity Control for Irrigation Water Used in Nurseries and Greenhouses from North Carolina State University, and **Understanding and Managing Irrigation Water Alkalinity** from the University of Kentucky Nursery Crop Extension Research Media and Water Testing page. The bolded article, and others, are listed on the right of the linked page.

Juvenile characteristics of Poison Ivy (*Toxicodendron radicans*) and other similar species

Zenaida Viloria, Extension Associate, Nursery Crops
Win Dunwell, Extension Professor, Horticulture

Poison ivy (*Toxicodendron radicans*), a deciduous woody vine, grows all over in the USA, except Hawaii, Alaska and arid areas of south west. It can be found in the woods, home gardens and parks. It is considered an obnoxious plant due to the severe allergic skin reaction of sensitive people to the urushiol oil. Poison ivy contains urushiol in all plant tissue.

- Identifying Poison ivy at early stage of their development, when plants lack of flowers, fruit and its very distinctive aerial hairy roots, might be puzzling. One must generally rely on the plant's foliage which can be similar to those of many other species that share the same habitat (Figure 1).

Figure 1. Three woody vines sharing the same habitat: Poison ivy (Red oval), Virginia creeper (Yellow oval), and *Vitis* spp. (Blue Oval).

Photo: Win Dunwell, University of Kentucky

Continued on next page...

Moreover, Poison ivy's leaf morphology is variable, for instance leaf margin can be smooth, serrated (saw-like) or lobed. So we must take a close look to its leaves to avoid going wrong. Poison ivy leaves are trifoliate, this is, a leaf is made up of three leaflets; one on the top and two opposed to each other at the base (while rare there can be 4 to 7 leaflets). Leaf stem is long for the terminal leaflet and leaf and very short and reddish for the basal leaflets (Figures 2A and 2B). The leaf insertion to the stem is very distinctive, leaf stem or petiole base is wide and surrounds a large portion of stem perimeter (Figure 2C). V-shaped scar is visible on the stem when a leaf drops. Leaf arrangement on the stem is alternate, they arise anywhere on the stem, but never face each other.

Figure 2. Vigorous growth of juvenile Poison ivy plants. Diagram shows the leaf petiole insertion.

Leaf color in the spring is bright red, turn green in summer and in the fall they become yellow, orange and deep red before they drop off the vine (Figure 3). Small Poison ivy plants are bush type, and turn into vine as they grow, and climb straight on the support.

Continued on next page…

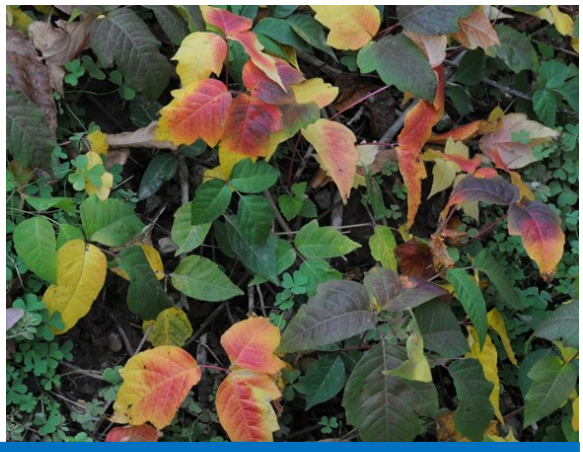


Figure 3. Early fall color of Poison ivy.

Photo: Win Dunwell, University of Kentucky Horticulture

Some juvenile plants similar to Poison ivy

Virginia creeper (*Parthenocissus quinquefolia*) is also a woody vine that is distributed in eastern and central North America. Poison ivy and Virginia creeper have similar habit and seasonal color change. It has five leaflets per leaf, or three on rare occasions (Figure 4). The major differences are the presence of hairy stems and tendrils, a specialized thin stem that has a terminal adhesive disk for attachment.

Figure 4. Young Virginia creeper plants. Trifoliate leaf can be noticed on plant located on the right corner, however the terminal leaflet shows very short petiole. Five leaflets per leaf is the main difference and short petiole of terminal leaflet.

Photo: Win Dunwell, University of Kentucky Horticulture.

Boxelder maple (*Acer negundo*) small seedlings are similar to Poison ivy, because they have what looks like trifoliate leaves but are actually a pinnately compound leaf with three (looks like Poison ivy) to five or more leaflets and red leaf stem (Figure 5). The leaf arrangement on stem is opposite and differs from Poison ivy's alternate leaf arrangement.

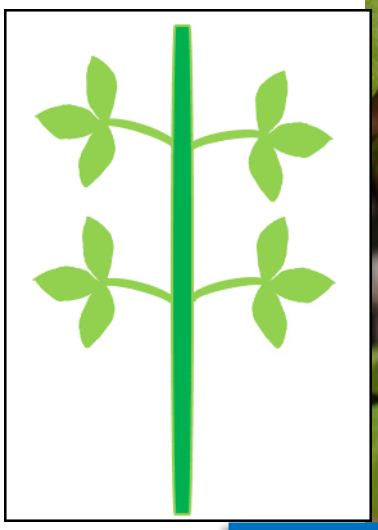


Figure 5. Boxelder maple seedling. Opposite leaf arrangement and short terminal leaflet petiole are the major traits different from Poison ivy (See diagram).

Photo: Win Dunwell, University of Kentucky Horticulture.

Continued on next page...

Groundnut or wild potato (*Apios americana*) is a climbing legume with pinnate compound leaves (three to nine two-inch leaflets with no teeth (five leaves are the most common) (Figure 6). Leaf petioles are green. It can be found in the woods sharing habitats with Poison ivy and damp areas.

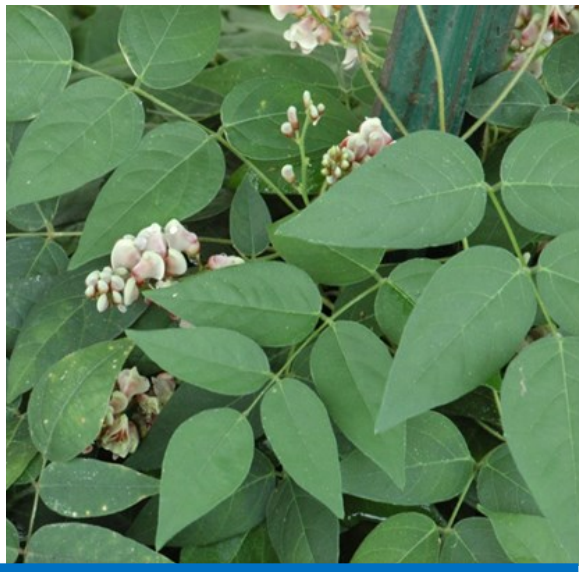


Figure 4. *Apios Americana*

Photo: Win Dunwell, University of Kentucky Horticulture.

Additional information

Poison ivy. http://www.clemson.edu/extension/hgic/pests/pdf/hgic2307.pdf
Meister, K.K. 2006.Poison ivy.http://msue.anr.msu.edu/uploads/files/e2946.pdf

Brown S.P. and P. Grace. 2015. http://edis.ifas.ufl.edu/pdffiles/EP/EP22000.pdf
Lerner, B.R. and T. Legleiter. https://www.extension.purdue.edu/extmedia/HO/HO-218-W.pdf

Bullock F. Poison ivy identification and control. 2011. http://www.tnstate.edu/extension/documents/Poison%20ivy%20Fact%20sheet%20ANR-7.pdf

The University of Kentucky's **Nursery Crop Extension Research Team** is based out of two locations across the bluegrass to better serve our producers.

The **University of Kentucky Research and Education Center (UKREC)** in **Princeton** serves western Kentucky producers while our facilities and personnel on main campus in **Lexington** serve central and eastern Kentucky producers.

Contact Us

Western Kentucky
UK Research & Education Center
1205 Hopkinsville Street
P.O. Box 496
Princeton, KY 42445
270-365-7541

Central / Eastern Kentucky
UK Main Campus
Horticulture Department
N-318 Ag. Science Center North
859-257-1273

Visit us on the web at
https://nursery-crop-extension.ca.uky.edu/