Kentucky Nursery LISTSERV Bulletin

University of Kentucky Nursery Crops Team

End of September 2016

Long Range Outlook Information

Fall seems to have finally shown up in the last week with the rains, but temperatures will climb back up quickly. Over the next month, we will continue to experience higher than average temperatures for the month October, as will most of the rest of the U.S.

Historically in October, North-Central and Eastern KY experience an average high in the upper 60s. Western and South-Central KY normally experience an average high in the low to mid 70s.

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

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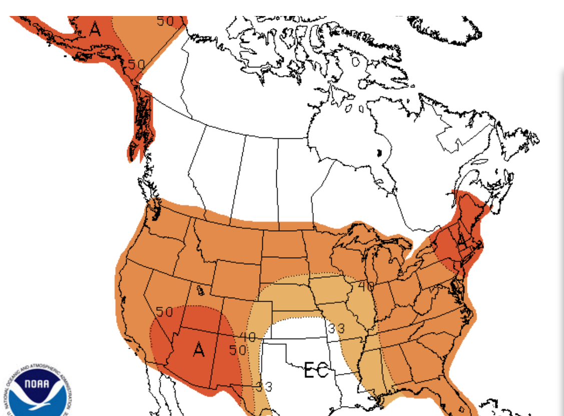

Outlook Imagery, Precipitation probability, Image: NOAA

- **Bacterial Leaf Scorch Can Torch Landscape Trees**
- **Soil-borne Pathogens Serve as the Biggest Threat to Mum Production in KY**
- **Handling and Storage of Controlled Release Fertilizer**

Bacterial Leaf Scorch Can Torch Landscape Trees

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

Kentucky's landscapes are populated by many trees that are susceptible to bacterial leaf scorch. This disease may not kill trees instantly, but over time, it can have devastating effects. Pruning and reducing stress can prolong the life of infected trees; however, there are currently no methods to prevent or cure bacterial leaf scorch.

Bacterial Leaf Scorch Facts:

- Infected trees exhibit premature leaf browning (Figure 1), marginal necrosis, and defoliation. In subsequent years additional branches will present the same symptoms until the entire tree becomes prematurely brown (Figure 2).
- Symptom development typically occurs in mid- to late summer
- Symptoms of bacterial leaf scorch can resemble abiotic/stress, so confirmation by a diagnostic lab is advised.
- Trees such as sycamore, maple, and oaks are susceptible. Pin oak and red oak are the most commonly reported hosts in KY.
- Caused by the bacterium *Xylella fastidiosa*
- Spread by leafhopper and treehopper insects.

Figure 1. Premature leaf browning of a pin oak tree branch infected with bacterial leaf scorch.

Photo: John Hartman, University of Kentucky

Management Options:

There is no cure for bacterial leaf scorch, and trees will eventually die once infected. The following suggestions may help preserve the appearance and life of diseased trees:

- Prune newly infected trees to preserve appearance.
- Water trees in the heat of summer to reduce stress
- Tree-injections can be costly and do not cure the disease; however, they may prolong the life of the tree.

Figure 2. Pin oak tree that has turned entirely brown prematurely from many years of bacterial leaf scorch infection.

Photo: John Hartman, University of Kentucky

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Replace infected trees with species that have shown resistance to the disease. Suggestions include:

- European beech
- Kentucky coffeetree
- Shagbark hickory
- Common sassafras
- Tuliptree

Additional Information

Bacterial Leaf Scorch (PPFS-OR-W-12)
http://www2.ca.uky.edu/agcollege/plantpathology/ext_files/PPFShtml/PPFS-OR-W-12.pdf

Soil-borne Pathogens Serve as the Biggest Threat to Mum Production in KY

Kim Leonberger, Extension Associate, Plant Pathology
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Many Kentucky vegetable and greenhouse producers are beginning to include fall chrysanthemum production in their operations. Mums are usually planted in June and sold in September when fall color is in demand. In Kentucky, mum production can vary in size, and small growers can produce as few as 200 plants per season. Size of production, in turn, can influence cultural practices and initial investment in important practices like surface drainage, pre-plant fungicide dips, and pre-emergent herbicides (Figure 1).

Figure 1. Cultural practices such as surface drainage and weed control can affect disease severity in mum plots.

Photo: Nicole Ward Gauthier, University of Kentucky

Typically, these plants are set outdoors onto nursery cloth that is in direct contact with the natural ground. Because the most common mum diseases are caused by soil-borne pathogens, the threat of disease losses can be as much as 50%, while average losses range from 10% to 25%. In these cases, soil-borne pathogens overwinter in soil beneath nursery cloth. If plants are set into the same areas year after year, inoculum builds up and disease risk increases with each passing season.

The Three Most Common Diseases on Mum in Kentucky Are Caused by Soil-borne Pathogens

⇒ Pythium Root Rot

Figure 2. Pythium root rot causes roots to turn black or gray.

Photo: Paul Bachi University of Kentucky

Pythium spp. are water mold pathogens (not fungi) that favor cool, wet conditions. Water molds produce swimming spores that move freely in water, increasing risk of infection when water puddles underneath pots. Pythium infects at root tips and then colonizes root systems, causing root loss (Figure 2). In turn, plants wilt from lack of water uptake.

Decaying roots turn black and the root cortex may slough off. Black stem lesions may be visible at soil surfaces. Because Pythium spp. are not true fungi, targeted products should be used for disease management. Products that contain etridiazole or mefenoxam are most effective. Infected plants are not curable, so preventative disease management is recommended. Cultural practices, including proficient drainage and sanitation, are critical components for a preventative disease management program.

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⇒ Rhizoctonia Web Blight

The *Rhizoctonia* fungus does not produce spores, but moves via the growth of threadlike masses called mycelia. Initial infections begin at the soil surface and are responsible for crown rot. Fungal webbing often grows up to upper plant parts when plant canopies become dense and humid (Figure 3). These web-like mycelia often can be seen without a microscope (Figure 4). Disease usually becomes a problem as plants mature and foliage does not dry out quickly. Large parts of plant turn brown and necrotic and wilt as the fungus invades branches (Figure 5).

Figure 3. High humidity and long periods of wetness are conducive to disease such as web blight.

Photo: Nicole Ward Gauthier
University of Kentucky

Fungicides containing azoxystrobin, fludioxonil, iprodione, propiconazole, pyraclostrobin, tebuconazole, thiophanate-methyl, trifloxystrobin, and triflumizole provide effective control. Increase air circulation and promote rapid drying to help reduce disease development. Sanitation is also important to reduce carry-over from one season to the next.

Figure 4. Fungal "webbing" of Rhizoctonia web blight may be visible on upper plant parts

Photo: Nicole Ward Gauthier
University of Kentucky

Figure 5. Leaves and stems turn brown from Rhizoctonia web blight.

Photo: Nicole Ward Gauthier
University of Kentucky

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⇒ **Fusarium Wilt**

This fungal pathogen invades vascular systems and causes leaf yellowing and plant wilt (Figure 6). Fusarium fungi infect plant roots and then colonize internal tissue. Collapse of these "water and nutrient highways" can result in starvation of upper plant parts. Often, a single branch or plantlet will show symptoms before the rest of the plant. Necrosis or brown streaks may be visible on outer surfaces of stems, and cross sections usually indicate necrotic (brown decaying) vascular tissue. Often, Fusarium wilt is present with one or more other soil-borne diseases. Adjust pH to 6.5 to 7.0 (avoid highly acidic soil). Fusarium wilt is extremely difficult to manage after infection occurs, but fungicides containing azoxystrobin, fludioxonil, and pyraclostrobin are effective at suppressing the pathogen. Avoid infection by preventing contact with soil or surface water.

Figure 6. Fusarium wilt results causes yellowing and wilting as fungi affect vascular tissue.

Photo: Chazz Hesselein, Alabama Cooperative Extension Service, bugwood.org

Resources

- Garden Mum Production: Diseases and Nutritional Disorders (PPFS-OR-H-10)
- Fungicides for Management of Diseases in Commercial Greenhouse Ornamentals (PPFS-GH-3)
- Greenhouse Sanitation (PPFS-GH-04)
- Effectiveness of Various Chemicals for Disease Control of Ornamental Plants (Southern Nursery IPM)

Handling and Storage of Controlled Release Fertilizer

Zenaida Viloria, Extension Associate, Nursery Crops
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Controlled release fertilizer (CRF) technology has led to the formulation of a large selection of fertilizers encapsulated with organic or inorganic materials. Coatings of CRF are acrylic resins, polyethylene waxes and elemental sulfur. In the most technically advanced CRF, the thickness of the coating and temperature control the nutrients release rate, and pattern and duration of nutrient release to provide plants the nutrients at the right time.

Regardless of fertilizer type, excess fertilizers can contaminate surface and groundwater with negative consequences for wildlife and humans. Coating nutrients reduces the runoff and leaching, and subsequent environmental pollution. However, improper fertilizer management practices in the field and storage procedures may lead to losses and environmental contamination.

CRF Handling and Storage

In general, use and storage of fertilizer must be in compliance with federal, state, and local laws and regulations. Structures for fertilizer storage must provide dry and cool environmental conditions, with ventilation to avoid accumulation of fumes and temperature control to avoid heat buildup.

- Poor CRF handling may increase nutrients release due to fractures of prills or pellets. Therefore, bags must be handled carefully. Prill cracks are not always visible to the eye. Therefore CRF must be inspected in plant media mixing and canning machines by confirming size of prills and checking for the presence of dust.

- Open bags should be sealed and kept protected from water and high temperatures. Dispensed fertilizer in buckets must be used quickly to reduce moisture absorption and early nutrient loss. This is especially true if stored in higher temperatures. (Figure 1).

- Fertilizer must be kept in containers or bags on pallets, not on direct contact with ground. It should be stored indoor, to protect them from rain (Figure 2).

- Once media are mixed with CRF, the storage time must be short to avoid nutrient losses and/or excessive salt accumulation.

Figure 1. Wet controlled release fertilizer after a few days in a bucket at high summer temperatures.

Photo: Ginny Travis, University of Kentucky

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- Avoid dusty or damp conditions while loading equipment with CRF.

- Duration of storage needs to be recorded and managed to reduce nutrient losses and economic waste. Reducing storage time through inventory management also helps to reduce negative environmental impacts. All open containers and bags should be labeled by the date they were opened.

Figure 2. Unopened bags and tightly sealed bags of CRF are kept in dry conditions, off the ground.

Photo: Zenaida Viloria, University of Kentucky

Additional information

- Sumner, P., and A. Speir. 2009. Fertilizer storage and handling. University of Georgia. Cooperative Extension. http://aware.uga.edu/wp-content/uploads/2009/09/Fertilizer-Storage-Update.pdf
- Janssen, C., F. Whitford, J. Becovitz, and M. Pearson. Bulk pesticides and fertilizer storage on Indiana farms. PPP-63. Purdue University Cooperative Extension. https://www.extension.purdue.edu/extmedia/PPP/PPP-63.pdf
- Trenkel, M.E. 1997. Improving fertilizer use efficiency. Controlled-release and stabilized fertilizers in agriculture. http://www.wnkgroup.com/Controlled-Release%20fertilizer%20in%20Agriculture.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.

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