

Kentucky Nursery LISTSERV Bulletin

University of Kentucky Nursery Crops Team

End of May 2017

Summer Approaches

Cooler than average temperatures are forecast for the first week in June alongside a cumulative precipitation of over 4" of rain from May 30 to June 6 in some parts of the Commonwealth. Long range forecasts show all of June being wetter than average.

Into July and August, warmer than average temperatures are predicted with average rainfall amounts.

See [UKAg Weather's Long Range Outlooks](#) for a variety of forecasts of temperature and precipitation probabilities.

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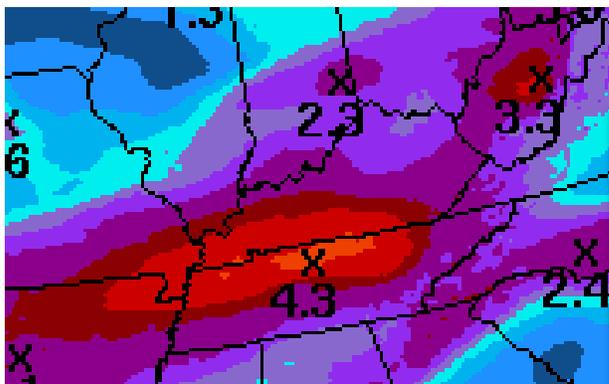
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Predicted Cumulative Precipitation May 30-June 6
Image: NOAA Climate.gov, 30 May 2017

- Rhizosphaera Needle Cast May Lead to Skippy Spruce
- Spider Mites on Landscape Plants
- Buckeye Seed Propagation

Rhizosphaera Needle Cast May Lead to Skimpy Spruce

Nicole Ward Gauthier, Extension Professor, Plant Pathology
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Rhizosphaera needle cast is often to blame for brown or thin spruce in the landscape. In Kentucky, Rhizosphaera needle cast is the most common disease of spruce; it also affects some pine species. This disease causes needle drop on lower branches, resulting in a distinct thinned appearance. Management options 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: USDA Forest Service Archive, bugwood.org

Rhizosphaera Needle Cast Facts:

- Becomes 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).
- Small, dark fruiting bodies (called pycnidia) form in stomata (pores in needles) and can be used to confirm diagnoses (Figures 3 & 4). Pycnidia are most easily recognized with a hand lens, but are also visible with the naked eye.
- Caused by the fungus *Rhizosphaera kalkhoffii*.
- Spread by rain; moisture is needed for infection.
- If defoliation occurs over 3 to 4 consecutive years, branch death is likely.



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

Photo: Minnesota Dept. of Natural Resources, bugwood.org

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Management Options:

Stressed trees are more susceptible to infection than healthy plants, so steps should be taken to maintain plant vigor.

Properly space plants to improve air circulation, thereby encouraging rapid drying of needles.

Practice good sanitation habits.

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 two consecutive years during spring when fungi are most active.



Figure 3. Fungal pycnidia are often visible without a hand lens

Photo: Paul Bachi, University of Kentucky



Figure 4. Fungal pycnidia protrude from stomata.

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

Spider Mites on Landscape Plants

Excerpted from ENTFACT-438: Spider Mites on Landscape Plants

Spider mites are a common and difficult to control pest in nursery crops. Attacking both deciduous and evergreen plants, spider mites can cause stippled and distorted leaves. During the summer months, growers should be aware of a variety of spider mite species, including:

- **Twospotted Spider Mite (*Tetranychus urticae*)**

This spider mite has a wide host range and is therefore the most commonly found spider mite. Immatures and adults are yellowish to greenish with two dark spots on either side of the body. Twospotted spider mites overwinter as adult females in the soil or under the bark of host plants. They become active during the spring and may feed and reproduce throughout the summer and into fall provided conditions remain favorable for plant growth. Damaging populations seldom during wet, cool weather. The mites are especially destructive to winged euonymous (burning bush) in landscapes.

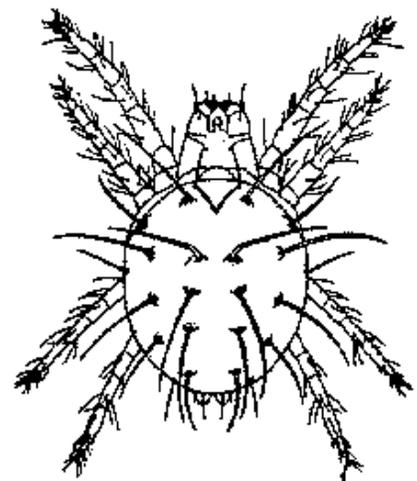


Twospotted Spider Mite

Photo: University of Kentucky Entomology

- **European Red Mite (*Oligonychus ununguis*)**

It is especially common on flowering fruit trees such as apple/crabapple, cherry, pear, plum, hawthorn, and serviceberry. European red mites overwinter as bright red eggs laid in clusters on branches, limbs and trunk, often in such great number that the bark seems to be covered with red brick dust. Following spring egg hatch, there may be several generations per year. Development from egg to adult varies from about 3 weeks at 55 degrees F to less than 1 week at 77 degrees F. All life stages (eggs, immatures, and adults) are brick red.



**EUROPEAN RED MITE
FEMALE**

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Maple Mite (*Oligonychus aceris*)

This mite is an important pest of nursery-grown maples, especially Freeman maples, and it occasionally infests maples in landscapes as well. Feeding on the underside of leaves causes stippling and yellowing of foliage. The mites resemble twospotted spider mites but may have a more reddish or pinkish tint. Maple mites overwinter as bright red eggs on the bark.

Controlling Infestations

Spider mites are one of the more difficult groups of landscape pests to control. Infestations are easiest to control when detected early, before the mite populations have reached very high levels. Twospotted spider mite infestations can often be traced to the purchase of infested plant material. When buying new plants, it pays to inspect the lower leaf surfaces for evidence of mites. Low populations of spider mites may be held in check by naturally occurring predatory mites which feed on both eggs and active stages.



Stippling of maple leaf, with relative size of Maple mite.

Photo: Carey Grable, Joshua Knight, University of Kentucky

Elimination of moderate to heavy infestations of spider mites usually requires the use of specific pesticides known as miticides. Some, but not all, insecticides will also control mites. Several mite-control products are listed in the table below. Some kill only active mites while others also kill eggs. Always read and follow the directions accompanying the product you are using. Some miticides may harm or discolor certain types of landscape plants. In most cases, two or more applications at 5-10 day intervals will be needed for satisfactory control. Spider mite eggs that have not yet hatched are unaffected by most miticides; the same may be true of larvae and nymphs that are molting. Horticultural oils can be used on landscape plants during the warmer months of the year when green foliage is present and the plants (and mites) are actively growing. Horticultural oils are applied at rates of 1.0 to 2.0%.

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Some Effective Products for Mite Control on Landscape Plants

Product Name	Formulation ¹	Residual activity	Comments
Akari	SC	Up to 21 d	Controls all life stages including eggs; no translaminar activity so thorough coverage is essential
Avid	EC	Up to 28 d	Translaminar; controls mobile life stages, not active against eggs ^{2,3}
Floramite		Up to 28 d	Same as for Akari
Forbid	SC, F	Up to 30 d	Translaminar, controls all life stages
Hexygon	DF	Up to 45 d	Controls eggs and newly-hatched nymphs; no activity on adults; not translaminar so thorough coverage essential
Judo	SC	Up to 30 d	Same as for Forbid
Oil, Dormant		NR ⁴	Contact activity only, thorough coverage essential
Oil, summer		NR	Same as for Oil, Dormant
Ovation	SC	Up to 45 d	Same activity and mode of action as Hexygon
Pylon	EC	Up to 28 d	Same as for Avid
Sanmite		Up to 45 d	Same as for Akari
Shuttle	SC	Up to 28 d	Same as for Akari
Soaps (fatty acid salts)		NR	Contact activity only, thorough coverage essential
TetraSan	WDG	Up to 28 d	Translaminar, controls eggs and immature stages; minimal activity on adults but treated females do not produce viable eggs
<small>1SC = soluble concentrate; EC = emulsifiable concentrate; F = flowable ; DF = dry flowable; WDG = water dispersable granule 2Translaminar refers to insecticides and miticides that can penetrate the leaf tissue and form a reservoir of active ingredient within the leaf. 3Mobile life stages include nymphs and adults, but not eggs 4NR: no residual, mites must be hit by spray</small>			

CAUTION! Pesticide recommendations in this publication are registered for use in Kentucky, USA ONLY! The use of some products may not be legal in your state or country. Please check with your local county agent or regulatory official before using any pesticide mentioned in this publication.

Of course, **ALWAYS READ AND FOLLOW LABEL DIRECTIONS FOR SAFE USE OF ANY PESTICIDE!**

Information from [ENTFACT-438: Spider Mites on Landscape Plants](#)

Buckeye Seed Propagation

Zenaida Viloria, Extension Associate, Nursery Crops
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Bottlebrush buckeye (*Aesculus parviflora*), yellow buckeye (*Aesculus flava*) and red buckeye (*Aesculus pavia*) are native to southeastern US.

For most buckeye species, seed propagation is easy and stratification at temperatures in the range of 34-40° F is recommended for up to 2-4 months. Another important feature of buckeye seeds is the lack of dehydration tolerance. Thus, seeds must be either sown, stratified or stored right after harvest and before they dry.



Red Buckeye seeds

Photo: Zenaida Viloria

Based upon seed behavior in storage, buckeye seeds are classified as recalcitrant because they cannot withstand low moisture content or freezing temperatures after harvest. Recalcitrant seeds will lose viability as they water content declines, with critical moisture content around 30-50% and temperature in the 32-41° C range. In contrast, orthodox seeds can be stored for a long time at sub-zero temperatures and they tolerate moisture content as low as 2-6%.



Bottlebrush buckeye seeds

Photo: Zenaida Viloria

Obviously, between these two categories there are intermediate seed storage groups. Storage conditions for particular seed must be reviewed in order to provide appropriate conditions for high seed quality preservation. Oak, maple, walnut, sycamore, pawpaw seeds are also recalcitrant.

Last fall we collected Yellow, Red and Bottlebrush buckeye seeds that were washed with 10% commercial bleach for 20 min. to reduce any risk of contamination later on. Afterwards, seeds were rinsed with running tap water and stratified in moist perlite in plastic bags at 38° F for periods of 30, 60 or 90 days. After stratification, seeds were germinated in a soil mix in a greenhouse with temperature set at 55° F in winter.



Yellow buckeye seeds

Photo: Zenaida Viloria

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In dehiscent (splitting) Bottlebrush buckeye fruit still hanging on the plants, it was common to see some radicles emerging from seeds. However, seedlings started to arise above the soil after three months in non-stratified seeds. This phenomenon occurs because the upper embryo portion needs stratification and cooler temperatures to complete its development. Germination percentage was 90% for non-stratified seeds, but it took about 4 months for most of the seeds to germinate.



Pre-germination of Bottlebrush

Photo: Zenaida Vilorio

Stratification for 30 days reduced germination to 80% but seeds germinated faster.

Red buckeye seeds germinated a well at any stratification period, plants grew rapidly, and tap roots hardened in a short time. To avoid tap root deformation it is necessary to transplant seedlings after germination or germinate them in containers that provide enough volume for root growth. The germination percentages were 85, 100 and 83 % for 30, 60 and 90 days of stratification respectively. Again, the longer the stratification the shorter is the germination time for most of the seeds, 90, 50 and 23 days for 30, 60 and 90 day stratification respectively.

The germination of Yellow buckeyes reached 100% when seeds were stratified for 60 days. Germination decreased to 85 and 83% for 30 and 90 day stratification, respectively. After six months, 50 % of non-stratified seeds germinated. These seedlings are very strong and grow very fast. No doubt, these seeds need stratification to shorten germination time and improve germination percentage.

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

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