Kentucky Nursery LISTSERV Bulletin

University of Kentucky Nursery Crops Team

End of November 2016

Long Range Outlook Information

Winter is just about here, with cooler weather and shorter days. After many months of predictions for warmer-than-average temperatures, the long range forecasts (one month and three month) are predicting an equal chance of cooler- or warmer-than average temperatures. Higher than average precipitation is predicted across the Commonwealth over the next month.

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

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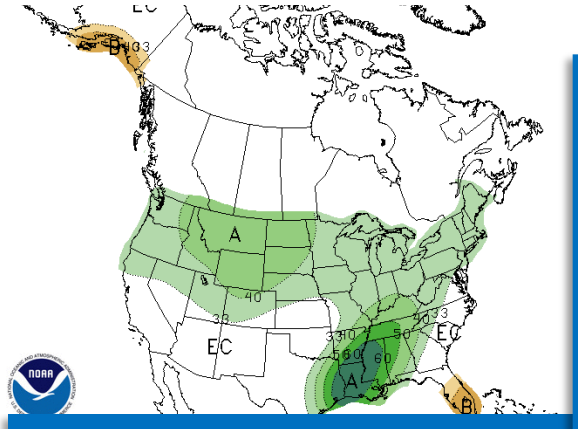

One-Month Outlook Precipitation probability, Image: NOAA 30 NOV 2016

- **How Dry Seasons Affect Woody Plants**
- **Transplant Shock: Disease or Cultural Problem?**
- **Hardiness and Care of Container Nursery Stocks in Fall and Winter**

How Dry Seasons Affect Woody Plants

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

Recent weather patterns have resulted in dry conditions in many areas of Kentucky. However, water is an essential component to plant mass and is vital to growth, carbohydrate production, and nutrient transport. During periods of below-average rainfall or when rain distribution is uneven, plant health may decline (Figure 1).

Drought conditions or inadequate water results in plant stress. Symptoms of drought stress include wilting, leaf scorch (Figure 2), leaf drop, root loss, and dieback. Stressed plants are also more susceptible to diseases, insects, and winter injury. In situations where plants are yet to establish or drought conditions are prolonged, plant death may result. There are also several diseases that cause symptoms similar to those resulting from drought-related stresses.

For more information on drought stress and related disease problems, including symptoms, causes, and prevention, review the publication *How Dry Seasons Affect Woody Plants* (ID-89).

Figure 1. Drought or inadequate water may result in a decline of plant health.

Photo: Nicole Ward Gauthier, University of Kentucky

Figure 2. Water deficiency in leaves may cause scorch of leaf margines.

Photo: Cheryl Kaiser, University of Kentucky

Additional Information

- *How Dry Seasons Affect Woody Plants* (ID-89)
- Plant Pathology Publications (Website)

Transplant Shock: Disease or Cultural Problem?

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

Autumn has arrived in Kentucky, and now is one of the best times to plant new trees. Cool-season planting allows trees to "focus" on root system development. Woody plants may take as long as 3 to 5 years to establish and recover from relocation, and cool-season planting may expedite establishment.

When trees and shrubs are moved from one growing site to another, they endure stress that results in poor root establishment. This stress may be the effect of improper installation and/or selection of poor planting material, resulting in a condition known as "transplant shock". Plants that suffer from transplant shock may exhibit decline, dieback, reduced growth, and eventually death (Figure 1). In addition, plants experiencing transplant shock are more susceptible to secondary disease issues. There are also several diseases that cause symptoms similar to those resulting from transplant shock-related stresses.

For more information on transplant shock and related disease problems, including symptoms, causes, and prevention, review the publication *Transplant Shock:Disease or Cultural Problem?* (PPFS-OR-W-19).

Figure 1. Transplant shock results in decline, dieback and eventually plant death.

Photo: Jason Sharman, Vitalitree, bugwood.org

Additional Information

- Transplant Shock: Disease or Cultural Problem? (PPFS-OR-W-19)
- Plant Pathology Publications (Website)

Hardiness and Care of Container Nursery Stocks in Fall and Winter

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

It has rained little in the last couple of weeks in western Kentucky, soil is dry and as hard as concrete. The temperature is finally dropping and days are shorter, it indeed feels like fall. Cold hardy plants are getting ready for winter. While plants are hardening off, some factors such as high temperature spells and continuous plant growth can put at risk the full plant hardiness before the first frost or freeze.

Above ground portions of plants can harden to withstand colder temperatures, whereas roots will not harden to withstand extremely low temperatures. Therefore, roots are more sensitive to freezing temperatures than trunk and shoots. Occasional high temperatures in fall or winter will induce root growth, thus new tender roots are even more prone to die at subfreezing temperatures (Table 1). Root hardiness depends upon the species and developmental stage.

Figure 1. Mulching of balled-and-burlapped trees

Photo: Win Dunwell, University of Kentucky

In container nursery production, roots are exposed to colder temperatures and large temperature fluctuations compared to field-grown plants which benefit from the buffering capacity of the soil mass. Root hardiness can be lost within 24 hours of exposure to high temperature. If container sidewall are exposed to direct sunlight even on a cold winter day, the daily fluctuations in root-zone temperatures can be extreme. Therefore, root systems of container-grown plants must be insulated from severe changes in temperature. There are several methods to overwinter container stocks; species hardiness, tree size and quantity, hardiness zone and grower's resources determine the more appropriate method.

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In western or southern Kentucky, placing plants can-tight in upright position and adding an insulating barrier around the outside of the plants will provide some protection (Figure 1). Adding a deep mulch layer spread over the containers and insulating each block using bales of straw or hay along the perimeter improves survival rate in some winters and regrowth. This system also can be used for protecting balled and burlapped plants being stored for future landscape use or shipping. However, more substantial protection is required for container-grown plants in most of Kentucky. Overwintering hoop houses covered with white poly is a safer bet throughout the state. In addition to the outer layer of plastic, layers of white plastic and/or thermal blankets made of spun fabric placed over the plants inside the house can add up to 10F additional protection.

Common name (Scientific name)	Killing point of young roots (°F)	Killing point of mature roots (°F)
Flowering dogwood (*Cornus florida*)	21	10
Bearberry cotoneaster (Cotoneaster dammeri)	23	18
Bearberry cotoneaster (*Cotoneaster dammeri*) 'Skogholm'	19	12
Winged euonymus (*Euonymus alatus*) 'Compacta'	19	7
Wintercreeper (*Euonymus fortunei*) 'Vegetus'	23	12
Spreading euonymus (*Euonymus kiautschovicus*)	21	16
St. Johnswort (*Hypericum* spp)	23	18
Meserve holly (*Ilex* x*meserveae*) 'Nellie R. Stevens'	23	14
Chinese holly (*Ilex cornuta*) 'Dazzler'	25	18
Japanese holly (*Ilex crenata*) 'Helleri'	23	18
American holly (*Ilex opaca*)	23	9
Aquipernyi holly (*Ilex* x*aquipernyi*) 'San Jose'	21	18
Meserve holly (*Ilex* x*meserveae*) 'Blue boy'	23	9
Shore juniper (*Juniperus conferta*)	12	>-9
Creeping juniper (*Juniperus horizontalis*) 'Plumosa'	12	-4
Blue juniper (*Juniperus squamata*) 'Meyeri'	12	-1
Golden raintree (*Koelreuteria paniculata*)	16	-4
Star magnolia (*Magnolia stellate*)	21	9
Leatherleaf mahonia (*Mahonia bealei*)	25	12
Scarlet fire thorn (*Pyracantha coccinea*) 'Lalandei'	25	18
Cutleaf stephanandra (*Stephanandra incisa*) 'Crispa'	18	-1
Anglojap yew (*Taxus* x*media*) 'Hicksii'	18	-4
Doublefile viburnum (*Viburnum plicatum* var. tomentosum)	19	7

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Cold temperatures also affect the substrate water availability and the root capacity to absorb and transport water to the upper portion of the plant, which keeps transpiring in spite of being dormant, bringing about desiccation stress. Desiccation stress is more intensive in windy and sunny days with low humidity. Evergreen plants exposed to sun on a relatively warm day may transpire faster than their frozen root system can take-up water, resulting in leaf desiccation or scorch. This is another reason to consider protecting such plants in an overwintering house with a white poly cover.

Substrate water content must also be monitored throughout the winter. In winter, dormant deciduous and evergreen plants must be hydrated to keep active all the essential functions that assure the regrowth of healthy plants in the following spring. Watering must be done in anticipation of the freeze when temperatures are above 40◦F.

Additional Information

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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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