Kentucky Nursery LISTSERV Bulletin

University of Kentucky Nursery Crops Team

End of September 2017

"La Niña Watch" issued for next 6 months

NOAA's Climate Prediction Center states the current situation of sea surface temperatures in the central and eastern Pacific Ocean are "favorable" for the development of La Niña conditions from Fall of 2017 through Winter of 2018.

A wintertime La Niña pattern presents in the southeastern U.S. as warmer, drier weather with colder, wetter weather in the Midwest, Great Lakes and Northeast. As Kentucky is in a transition zone between these regions, cautious growers should prepare for highly variable weather patterns, potentially representing extremes from both climate types.

Nursery Crops Extension & Research Team

Winston Dunwell
Extension Professor
270.365.7541 x209

Dewayne Ingram
Extension Professor
859.257.8903

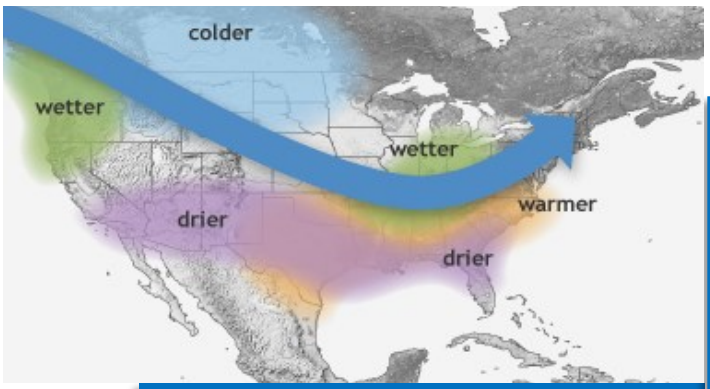
Zenaida Viloria
Extension Associate
270.365.7541 x279

Carey Grable
Extension Associate
270.348.1494

Joshua Knight
Extension Associate
859.257.1273

https://NCER.ca.uky.edu/

Joshua Knight, Managing Editor



Wintertime La Niña pattern
Image: NOAA Climate.gov

Emerald Ash Borer—2017 Update

Joshua Knight, Extension Associate, Nursery Crop Production

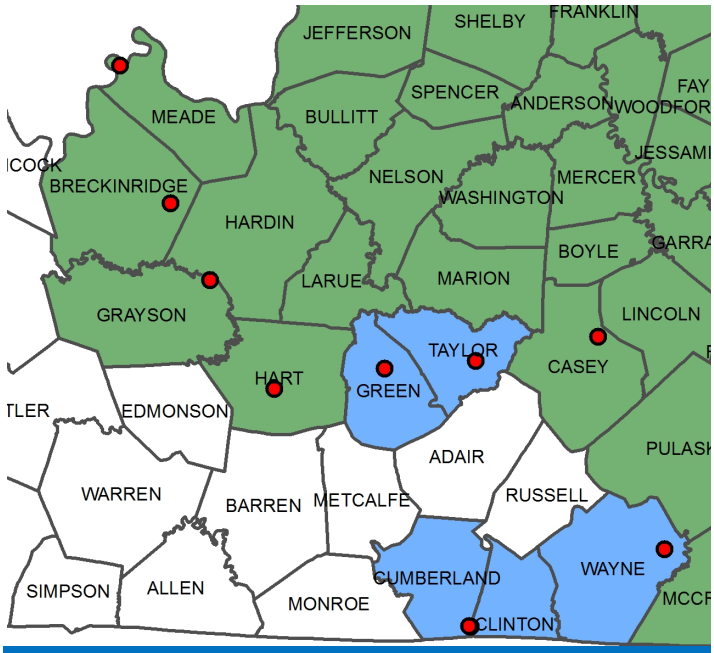


Figure 1. Current Emerald Ash Borer Infestation. Green = Confirmed 2009-2016, Blue = Confirmed in 2017, Red = Known edge of western spread.

Image: A. Nielsen, Kentucky Division of Forestry

Information in this article is excerpted from multiple sources, including Kentucky Pest News.

Current Situation

Since discovery in 2009, the emerald ash borer (EAB) has continued to invade Kentucky (Figure 1). Green, Taylor, Cumberland, Clinton, and Wayne counties have been added to the list of "infested" counties this year, though this does not mean it is present throughout entire counties.

Additionally, very high mortality of ash trees has occurred among unprotected trees within the region bounded by Jefferson, Fayette, and Boone counties.

Figure 2. Characteristic Emerald ash borer galleries and sloughing bark on infested ash.

Photo: A. Nielsen, Kentucky Division of Forestry

Is Prevention Treatment Worth It?

The economics of treating ash trees with insecticides for emerald ash borer (EAB) protection are complicated and depend on several factors. Consider tree size, health, location, value, as well as treatment cost, the likelihood of success, and potential costs of removing the trees. Scientists have compared costs of removing urban ash trees versus treating the same trees with emamectin benzoate, which provides 2 years of EAB control. Results consistently show treatment costs are much lower than removal costs.

Continued on next page...

As treatment options continue to evolve, costs of treatment will likely change. It will be important to stay up-to-date on these options and management recommendations.

Figure 3. Treated versus non-treated ash trees in Napierville, IL

Photo: isa-arbor.com

Benefits of treating trees can be more difficult to quantify than costs. Healthy landscape trees typically increase property values, provide shade and cooling, and contribute to the quality of life in a neighborhood. In addition, landscape trees, especially mature trees, capture storm water, reducing potential pollution of streams and rivers. The economic benefits provided by trees increase with the size of the tree, as does the cost of removal. Many people are sentimental about their trees. These intangible qualities are important and should be part of any decision to invest in an EAB management program. Hence, it may be particularly economical to treat larger trees.

The size of EAB populations in a specific area will change over time. Populations initially build slowly but increase rapidly as more trees become infested. As EAB populations reach peak densities, a high proportion of the untreated ash trees in a given area will decline and die, usually over a 3- to 5-year period. Once untreated ash trees in the area succumb, however, the local EAB population will decrease substantially. Ongoing studies in southeast Michigan and northwest Ohio, for example, indicate EAB populations still persist but at much lower densities simply because few mature ash trees remain in this area. Young ash saplings in forests or woodlots will likely be colonized by EAB eventually, so landscape ash may continue to face some risk of EAB infestation. It seems likely, however, that surviving ash trees can be managed with less frequent treatments once the EAB invasion has passed. Studies on the dynamics of EAB populations and whether the intensity of insecticide treatments can decrease after the local EAB population has collapsed are underway in Michigan and Ohio.

Continued on next page...

Figure 4. Many green insects can be confused with the emerald ash borer. This photo shows an EAB along with several look-alikes (top row, left to right): EAB, a bark gnawing beetle, *Buprestis rufipes*, green June beetle, and the caterpillar hunter. (bottom row, left to right): Japanese beetle, green tiger beetle, green stinkbug, dogbane beetle, and a metallic bee.

Photo: Paul Andre, Missouri Department of Agriculture

Additional Information

UK's Kentucky Emerald Ashborer site
http://pest.ca.uky.edu/EXT/EAB/welcomeeab.html

Emerald Ash Borer Detections and Treatment Horizon
https://kentuckypestnews.wordpress.com/2017/05/09/emerald-ash-borer-detections-and-treatment-horizon/

New County Reports of Emerald Ash Borer
https://kentuckypestnews.wordpress.com/2017/06/27/new-county-reports-of-emerald-ash-borer/

Late-summer weeds in container-grown blueberries

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

We are growing blueberry plants in 15-gallon containers with a pine bark substrate since May this year. We did not have many weeds the first months, but they are germinating lately in large numbers and growing very fast. Weeds are difficult to control in container nursery due to the large diversity of species, legal use of herbicide for any crop, close plant spacing and limited root volume. We have been hand weeding our container-grown blueberry plants from time to time because it is easy to clean 70 pots. Hand weeding is a recommended practice for commercial container nursery production, because it is cost effective although labor intensive. Indeed, several container nurseries hand weed successfully every two weeks according to Drs. A. Barker and J.C Neal (North Carolina state University). The success of this practice lies in removing the weeds before they go to seed and leaving the small ones for later, by doing so the task can be done in less time. Practices to reduce weeds around and under nursery stocks as well as in the substrate piles reduce the risk of weed infestation in containers.

Identification of weed species is important, as well as knowing their growth pattern and reproductive cycles, for best management. Here are the main characteristics of the species we found.

Yellow wood sorrel (*Oxalis stricta*): It is a clover-like perennial that grows as an annual in cooler climates. It propagates by seeds that are released from ripe fruits and by rhizomes. Hand removal is necessary for complete control.

Yellow wood sorrel (Oxalis stricta)

Photo: Win Dunwell, University of Kentucky

Continued on next page...

Prostrate or spotted spurge (*Euphorbia maculata*): Seeds germinate in spring or early summer, and mature in autumn. A single plant can produce several thousand seeds that germinate rapidly or can remain dormant until spring. It is very difficult to control once established, therefore prevention is the first option. The use of sterilized or weed-free soil mix is recommended. Spurge can regrow if not pulled completely.

Prostrate or spotted spurge (Euphorbia maculate)

Photo: Win Dunwell, University of Kentucky

It

Common chickweed (*Stellaria media*): is an invasive species. It is a winter annual, seeds germinate in late summer. Seedlings become dormant over the winter. It sets seeds in spring and early summer and dies. It can become perennial in cool and moist areas. Thousands of seeds are produce per plant. Stem rooting contributes to its dissemination.

Common chickweed (Stellaria media)

Photo: Win Dunwell, University of Kentucky

It

Carolina geranium (*Geranium carolinianum*): It is a biennial, sometimes a winter or summer annual. It forms a rosette the first year and grows upright and blooms the following year. Seeds germinate in late summer, early autumn or spring.

Carolina geranium (Geranium carolinianum)

Photo: Win Dunwell, University of Kentucky

Continued on next page...

Mulberry weed (*Fatoua villosa*): It is an aggressive invasive species, and a summer annual (perennial further south). Plants seed at very early stage, when the plants have three leaves. Fruit are dehiscent and release seeds far from the mother plant.

Mulberry weed (Fatoua villosa)

Photo: Win Dunwell, University of Kentucky

Dandelion (*Taraxacum officinale*): It is a perennial that is disseminated by wind-blown seeds and new shoots develop from broken taproot segments. Fully developed plants are difficult to remove by hand due to the deep taproot. Seedlings emerge from late spring to early autumn.

Dandelion (Taraxacum officinale)

Photo: Win Dunwell, University of Kentucky

Additional Information

Barker, A. and J.C Neal. Frequent hand weeding saves money. North Carolina State University. https://content.ces.ncsu.edu/frequent-hand-weeding-saves-money

Altland, J. 2003.Weed control in container crops. a guide to effective weed management through preventive measures. EM 8823 Oregon State University. Extension Service. https://oregonstate.edu/dept/nursery-weeds/feature_articles/EM8823.pdf

Robbins, J. and J. Boyd. Nursey Series. Weed control in container nurseries. University of Arkansas. Division of Agriculture. FSA6123. https://www.uaex.edu/publications/PDF/FSA-6123.pdf

Neal, J.C., J.F. Derr, S.C. Marble, and A.F. Senesac. 2017. Weed Management. 2017 Southeastern U.S. Pest Control Guide for Nursery Crops and Landscape Plantings https://content.ces.ncsu.edu/static/publication/js/pdf_js/web/viewer.html?slug=weed-control

Soil-borne pathogens serve as the biggest threat to mum production in KY

Nicole Ward-Gauthier, Extension Professor, Plant Pathology

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).

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.

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

Photo: Nicole Gauthier, University of Kentucky

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

Pythium Root Rot

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.

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

Photo: Nicole Gauthier, University of Kentucky

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.

Continued on next page...

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).

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

Photo: Nicole Ward-Gauthier, University of Kentucky

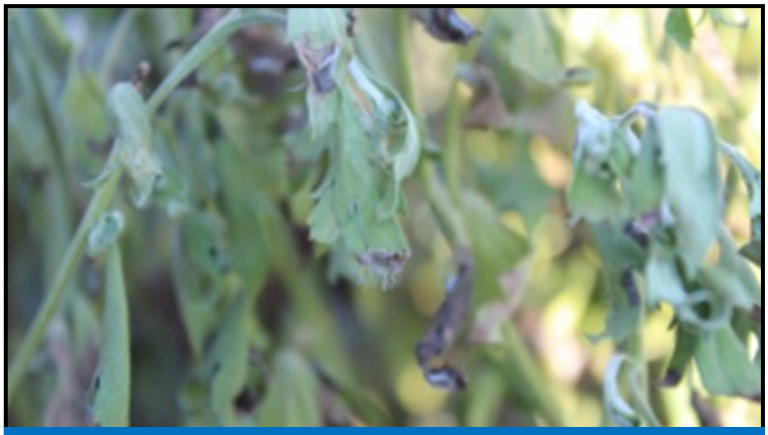


Figure 4. Fungal "webbing" of Rhizoctonia web blight may be visible on upper plant parts.

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

Continued on next page...

Fusarium Wilt

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

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

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 soilborne 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.

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)

Bacterial leaf scorch can torch landscape trees

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

Continued on next page...

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.

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

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

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

Additional Information

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