



College of Agriculture,  
Food and Environment  
Cooperative Extension Service

# Kentucky Nursery LISTSERV Bulletin

University of Kentucky Nursery Crops Team

End of March 2019

## April Forecasting as Warmer than Average

The National Weather Service Climate Prediction Center is forecasting an above average chance for higher than average temperatures during the month of April and this warmer-than-average trend is predicted to continue into May and June. According to the National Phenology Network, **spring leaf out** in the southern part of Kentucky is arriving earlier than average in 2019, but later than average along the Ohio River. Further analysis is available here:

<https://www.usanpn.org/news/spring>

Though precipitation rates will be near normal for April, the forecast is showing above average precipitation chances during the transition from March to April, especially in the western part of the commonwealth.

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

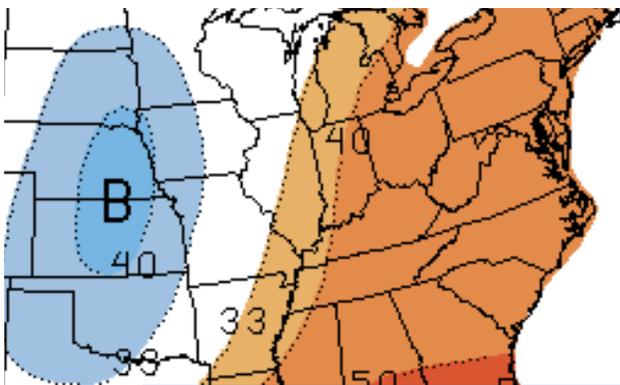
## Nursery Crops Extension & Research Team

**Winston Dunwell**  
Extension Professor  
270.365.7541 x209

**Dewayne Ingram**  
Extension Professor  
859.257.8903

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

Joshua Knight, Managing Editor



April 2019 Outlook, Temperature Probability  
Image: NOAA Climate.gov, 21 MAR 2019

- **WaterQual: A Free Tool for Evaluating Water Quality**
- **Don't Get Burned by Fire Blight, Disease Management Begins Now**

# WaterQual: A Free Tool for Evaluating Water Quality

Joshua Knight, Senior Extension Associate, Horticulture

Available at [www.cleanwater3.org/wqi.asp](http://www.cleanwater3.org/wqi.asp), **WaterQual** helps to determine whether or not water is of suitable quality to be used for irrigating plants in greenhouses and nurseries. **The first step is to have the irrigation water tested.** Some nutrient testing of water is offered through the UK Cooperative Extension Service / UK Regulatory Services. This test will give results for pH, conductivity, alkalinity, nitrate-N, phosphorus, potassium, calcium, magnesium, zinc, copper, iron and manganese. More information about relevant forms and basic information about common water quality issues are available at <https://ncr.ca.uky.edu/water-management>

Contact your Extension office to assist with taking water samples. Common water quality issues in Kentucky are diagnosed through this testing service and using the Extension publication available at the link above. Other testing labs can offer different testing services. A directory showing resources for Horticulture growers around the state, including water testing labs, is available at <https://www.uky.edu/ccd/maps>

When you have received the test results from your water samples, you can start using the WaterQual tool. Values from your water test can be entered into the WaterQual tool (see below). Not all boxes need to be filled for the tool to work, so you can choose to only provide information on nutrients or quality issues of particular concern.

## Nutrients and ions

Nitrogen (N)	<input type="text"/>	mg/L or ppm	▼	Copper (Cu)	<input type="text"/>	mg/L or ppm	▼
Phosphorus (P)	<input type="text"/>	mg/L or ppm P	▼	Boron (B)	<input type="text"/>	mg/L or ppm	▼
Potassium (K)	<input type="text"/>	mg/L or ppm	▼	Molybdenum (Mo)	<input type="text"/>	mg/L or ppm	▼
Calcium (Ca)	<input type="text"/>	mg/L or ppm	▼	Silicon (Si)	<input type="text"/>	mg/L or ppm	▼
Magnesium (Mg)	<input type="text"/>	mg/L or ppm	▼	Nickel (Ni)	<input type="text"/>	mg/L or ppm	▼
Sulfate-sulfure (S)	<input type="text"/>	mg/L or ppm S	▼	Sodium (Na)	<input type="text"/>	mg/L or ppm	▼
Iron (Fe)	<input type="text"/>	mg/L or ppm	▼	Chloride (Cl)	<input type="text"/>	mg/L or ppm	▼
Manganese (Mn)	<input type="text"/>	mg/L or ppm	▼	Fluoride (F)	<input type="text"/>	mg/L or ppm	▼
Zinc (Zn)	<input type="text"/>	mg/L or ppm	▼				

## Physical water quality

Total suspended solids (TSS)	<input type="text"/>	mg/L	▼	Turbidity	<input type="text"/>	NTU	▼
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## Biological problems

Total aerobic bacteria	<input type="text"/>	CFU/mL	▼	Thermotolerant coliforms	<input type="text"/>	CFU/mL	▼
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Interpret

Clear

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When “interpret” is clicked, the tool will return a list of results and explanations for measurements of concern. Results give a quick response if the measurement is high/acceptable while the explanation gives more details about how to manage problems associated with the results as well as further diagnostic steps to investigated.

The WaterQual tool provides information about ions, alkalinity, nutrients, physical water quality, and biological problems, based on the values that you provide. This tool will also provide suggestions about ways to get these various values into ideal ranges, depending on your operation’s needs as seen in the screen shot below.

Measurement	Test value	Result	Explanation of result
Total suspended solids (TSS)	6 mg/L	High (>5 mg/L)	<p>Filtration is necessary, with increasing need for multi-stage filtration to avoid clogging of drip or micro-irrigation equipment as TSS increases.</p> <p>At very high levels (above 50 mg/L) it may be necessary to consider flocculation followed by filtration.</p> <p>It is also important to know what types of particles are present (biological, chemical, or mineral) in order to select the best filtration option.</p> <p>If the particles are slimy (biological), then a sanitation treatment such as chlorine is also necessary. High TSS tends to reduce the efficacy of water sanitizing technologies.</p>

This is a very versatile and powerful tool for evaluating water quality, which is particularly important in tightly controlled systems like greenhouses and propagation areas. Often times, problems with irrigation and water delivery systems can be difficult to diagnose and treat. For example, in the sample recommendation above: high TSS can reduce the effectiveness of chlorination as the free chlorine can be bound up by the particles suspended in the irrigation water. By reducing the TSS, this grower may also take care of a difficult plant disease issue at the same time.

This tool and others available on the [cleanwater3.org](http://cleanwater3.org) site were developed with support from the USDA Specialty Crop Research Initiative. More information about this project is available on the website.



# Don't Get Burned by Fire Blight, Disease Management Begins Now

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

Fire blight is an important disease of apple, crabapple, pear, and flowering pear in Kentucky. Symptoms are often not observed until late spring or early summer; however, initial infections occur at bloom. The pathogen survives winter in dead, dying, and diseased wood and in cankers. Removal of these pathogen sources can reduce spread of fire blight and should be completed in late winter while the pathogen is dormant.

## Fire Blight Facts

- Early symptoms include wilt of flower cluster and blossom death (Figure 1). Disease spreads to shoots or branches where tips wilt and rapidly die (blight) to form a characteristic 'shepherd's crook' (Figure 2). Dark brown, sunken cankers (stem lesions) develop and expand to girdle branches, resulting in branch death (Figure 3).
- Potential hosts include apples, pears, and several landscape woody ornamentals in the rose family.
- Primary infection occurs at bloom and may continue through petal fall or until shoot elongation ends.
- Rainy conditions, periods of high humidity, and temperatures between 65-70°F favor disease development.
- Caused by the bacteria *Erwinia amylovora*.
- Bacterial cells overwinter in dead, dying, and diseased wood.



Figure 1. Apple flower clusters infected with fire blight.

Photo: Nicole Ward Gauthier, UK



Figure 2. Rapid shoot death from fire blight may result in a "shepherd's crook" appearance.

Photo: Nicole Ward Gauthier, UK



Figure 3. Dark brown, shrunken cankers develop and expand to girdle branches.

Photo: Nicole Ward Gauthier, UK

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## Management Options

- Select varieties that are tolerant or resistant to fire blight.
- Maintain plant health with proper nutrition and irrigation practices.
- Prune to increase air flow through the plant canopy.
- Remove infected plant tissues during winter when plants and pathogens are dormant. Do not prune when trees are wet. Burn, bury, or otherwise dispose of diseased material.
- Bactericides should be applied preventatively. Once infection occurs, sprays are not effective. Homeowners can apply copper during dormancy to reduce overwintering inoculum. Additional bactericides available for commercial growers are presented in the *Commercial Fruit Pest Management Guide* ([ID-232](#)). Always follow label directions when utilizing bactericides.
- Fire blight risk throughout the season can be determined by the disease development models available through the [UK Ag Weather Center website](#).

## Additional Information

- Fire Blight ([PPFS-FR-T-12](#))
- Fruit, Orchard, and Vineyard Sanitation ([PPFS-GEN-05](#))
- Backyard Apple Disease Management Using Cultural Practices (with Low Spray, No Spray & Organic Options) ([PPFS-FR-T-21](#))
- Simplified Backyard Apple Spray Guides ([PPFS-FR-T-18](#))
- Disease and Insect Control Programs for Homegrown Fruit in Kentucky including Organic Alternatives ([ID-21](#))
- Commercial Midwest Fruit Pest Management Guide ([ID232](#))

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.

Check out our [YouTube Channel!](#)

## 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/>

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