Introduction
Numerous plant diseases impact fruit crops throughout Kentucky. Factors such as plant growth stage, as well as rainfall, temperature, and other weather conditions, can be used to determine risk for plant disease. Prediction models are critical tools for growers, as they allow for protective management strategies to be deployed when disease risk is high. Use of these models can provide growers with cost savings, as unnecessary chemical applications are eliminated when risk of infection is low.

Ag Weather Prediction Models
The plant disease fruit prediction models are a collaboration between the University of Kentucky Department of Plant Pathology and the UK Ag Weather Center. Seventy-nine Kentucky Mesonet weather stations are located throughout the Commonwealth and are used to calculate the disease risk for each area. Disease prediction models can be found at http://weather.uky.edu/plant_disease.html.

This publication details the steps for using and interpreting results from the plant disease prediction models. For the instructions included here, fire blight has been selected as the model.

While these models are meant to provide guidance on disease risk levels and appropriate management actions, ultimately, growers should make the final decision on management or chemical applications that are best suited to their orchard or vineyard.
Using County Disease Prediction Models

Step 1
Select the disease model from the left-hand menu on the main page (in this case, Fire Blight).

Step 2
Scroll down the page and select a county from the drop-down menu.

Step 3
Select today’s date to determine current risk for fire blight. Other dates may be entered if assessment of past risk is warranted.

Step 4
Select disease history for the orchard.

Step 5
Click ‘submit choices’.

(Note: The instructions demonstrated here use the Fire Blight Prediction Model. Other models may require additional information to determine risk.)
**INTERPRETING COUNTY DISEASE PREDICTION MODELS**

Data generated from the information entered (county, date, orchard history), as well as weather conditions, is presented in a table.

<table>
<thead>
<tr>
<th>Date</th>
<th>Max Temp</th>
<th>Precip</th>
<th>Max RH</th>
<th>Infection Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>03/12/2018</td>
<td>39.7</td>
<td>0.38</td>
<td>100</td>
<td>NA</td>
</tr>
<tr>
<td>03/13/2018</td>
<td>38.8</td>
<td>0.02</td>
<td>100</td>
<td>NA</td>
</tr>
<tr>
<td>03/14/2018</td>
<td>38.1</td>
<td>0.00</td>
<td>96</td>
<td>NA</td>
</tr>
<tr>
<td>03/15/2018</td>
<td>39.4</td>
<td>0.00</td>
<td>62</td>
<td>Low</td>
</tr>
</tbody>
</table>

The table below presents the various possible levels of risk, as well as the associated action growers are advised to take. *Extreme* indicates the most elevated level of risk and *Low* represents the least amount of disease risk. Growers are advised to take appropriate action based on risk level.

<table>
<thead>
<tr>
<th>Risk Level</th>
<th>Advised Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extreme</td>
<td>Grower should spray with appropriate chemical</td>
</tr>
<tr>
<td>Exceptional</td>
<td>Grower should spray with appropriate chemical</td>
</tr>
<tr>
<td>High</td>
<td>Grower should spray with appropriate chemical</td>
</tr>
<tr>
<td>Moderate</td>
<td>Chemical application is warranted, especially if weather conducive to disease development is predicted</td>
</tr>
<tr>
<td>Caution</td>
<td>Chemical application is not advised, but weather forecasts and risk values should be closely monitored</td>
</tr>
<tr>
<td>Low</td>
<td>Chemical application is not required, but grower should consider orchard history and weather forecast</td>
</tr>
</tbody>
</table>

**USING THE STATE SUMMARY DISEASE MODEL**

**Step 1**
Under the heading *Maps for All Kentucky Counties*, select today’s date to determine current risk for fire blight. Other dates may be entered if assessment of past risk is warranted.

**Step 2**
Click ‘submit choices’.

(Note: This example is from “Fire Blight Maps for All Kentucky Counties”)

Using the State Summary Disease Model
The risk for each county is indicated on a map via a color key that is located in the upper left-hand corner. In the example below, some counties are considered to be at a low risk level, while others are marginal, and a large number of counties are considered high risk. Note: State-wide disease prediction summaries, such as displayed below, are not available for all disease models.

All models are also available through a mobile friendly website compatible with phones and tablets (weather.uky.edu/dim.html). Follow steps as previously described when using the mobile friendly format.

**ADDITIONAL RESOURCES**

- Ag Weather Plant Disease Prediction Models  
  [http://weather.uky.edu/plant_disease.html](http://weather.uky.edu/plant_disease.html)

- Plant Disease Prediction Models (Mobile Device Friendly Version)  
  [http://weather.uky.edu/dim.html](http://weather.uky.edu/dim.html)

- University of Kentucky Department of Plant Pathology Extension Publications  
  [https://plantpathology.ca.uky.edu/extension/publications](https://plantpathology.ca.uky.edu/extension/publications)

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**Photos:** Paul R Bachi, UK (pg 1). All other images are website screenshots of the UK Ag Weather Plant Disease Prediction Model for Fire Blight, taken on December 3, 2018 by Kim Leonberger.

**Editor:** Cheryl Kaiser

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