

# **Oak Wilt: *Warning Signs***

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# What is Oak Wilt?

- *Ceratocystis fagacearum*
- Vectored by nitidulid beetles
- An aggressive disease on a variety of oaks
- First documented in early 1940's
- May have been impacting oaks in the Midwest as early as 1890's

# Related Pathogens:

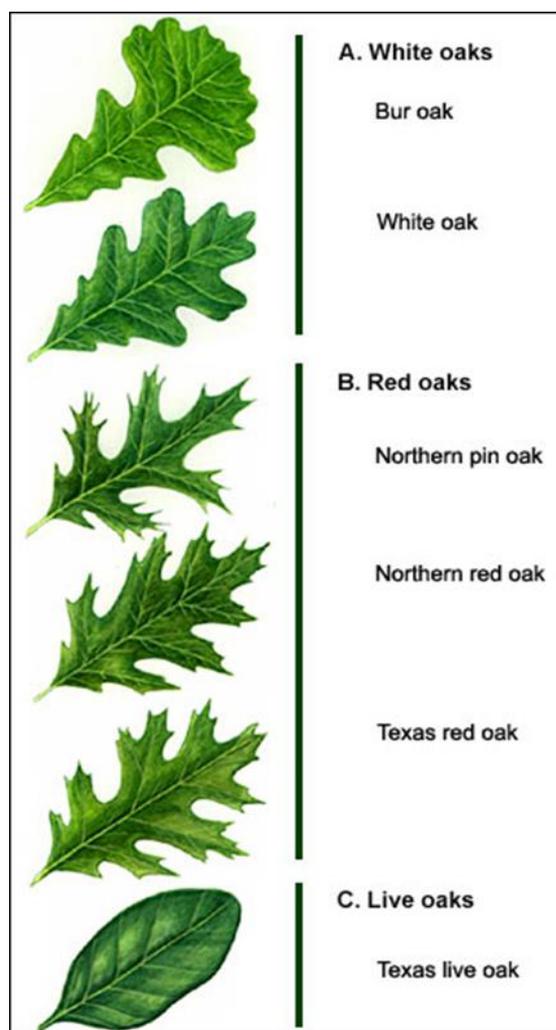
- ***Ceratocystis fimbriata***-sycamore
- **Several cankers and diebacks of poplar**
- ***Ophiostoma ulmi* (*Ceratocystis ulmi*)-Dutch elm disease**

# Oak Wilt pathogenicity:

- **Clogs xylem of the tree**
- **Gummy material also forms in the tree**
- **Rapid decline and death of the tree**
- **Beetles are attracted to spores on infected trees and can spread disease**

# Oak Wilt host range:

- **Most oaks**
- **In the Northeast, member of the red oak group are most susceptible**



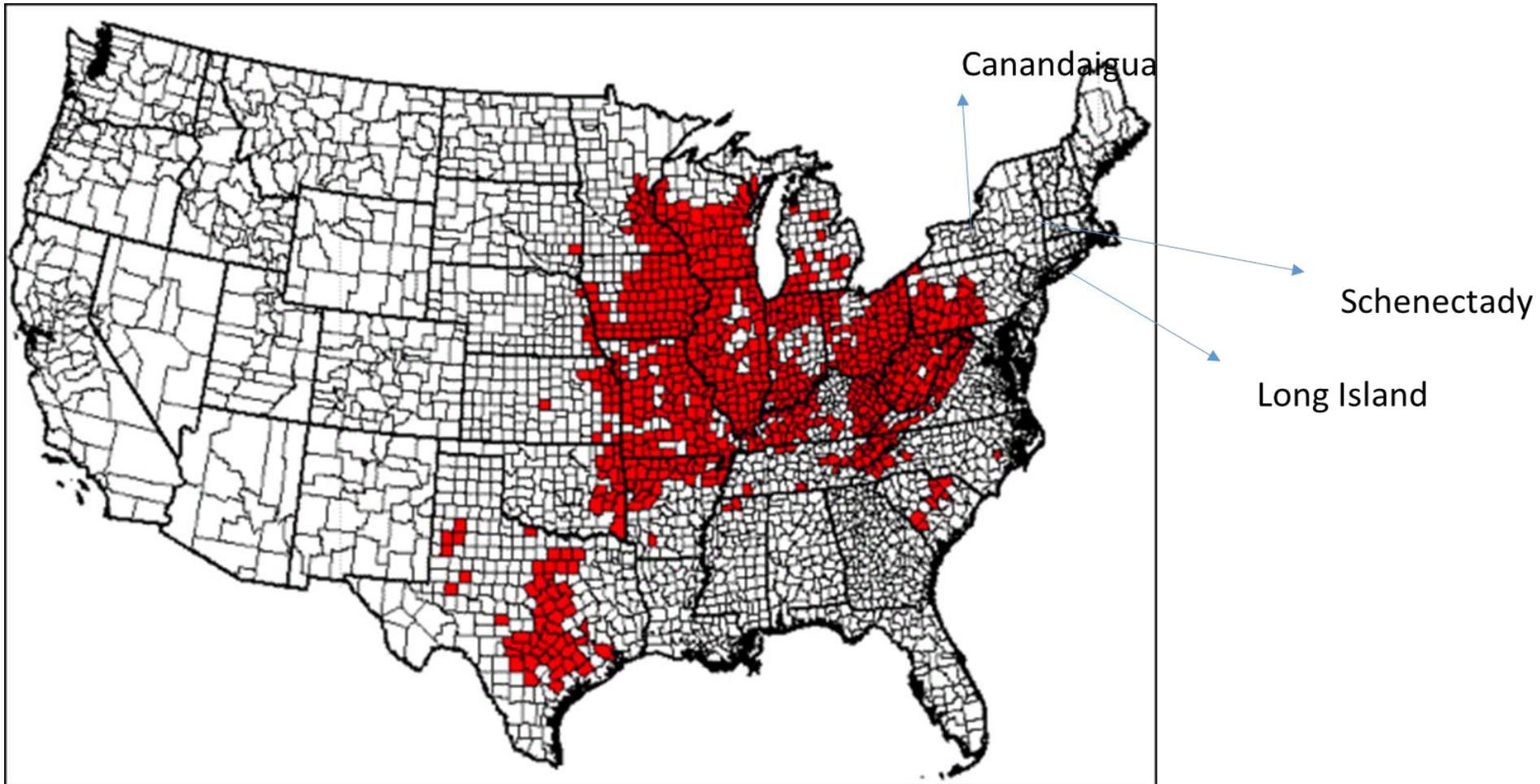
**Table 1. Oak species commonly killed by oak wilt<sup>1</sup>**

Common name(s)	Scientific name
Northern species	
Black oak	<i>Q. velutina</i>
Bur oak <sup>2</sup>	<i>Q. macrocarpa</i>
Northern pin oak	<i>Q. ellipsoidalis</i>
Northern red oak	<i>Q. rubra</i>
White oak <sup>2</sup>	<i>Q. alba</i>
Southern species	
Blackjack oak	<i>Q. marilandica</i>
Scrub live oak	<i>Q. fusiformis</i>
Shumard oak	<i>Q. shumardii</i>
Southern red oak	<i>Q. falcata</i>
Texas live oak	<i>Q. virginiana</i>
Texas red oak (Spanish oak)	<i>Q. buckleyi</i>

<sup>1</sup> All red oaks in the eastern United States are considered susceptible to oak wilt

<sup>2</sup> Infections are less common in these species and may take years to run their course.

# Current range of oak wilt:



# Oak Wilt symptoms:

- **Crinkling of leaves, discoloration**
- **Rapid leaf drop**
- **Wilting, flagging of tips**
- **Vascular discoloration**
- **Splits in the bark**
- **Rapid progress**



**Marginal discoloration of leaves**



**Branch and tip dieback**

**Branch and tip dieback**  
**Leaves may hang on**





**Branch and tip dieback; Leaves may hang on**



**Vascular discoloration  
due to oak wilt**





**Bark splits due to infection**



**Spore mats/Pressure pads**

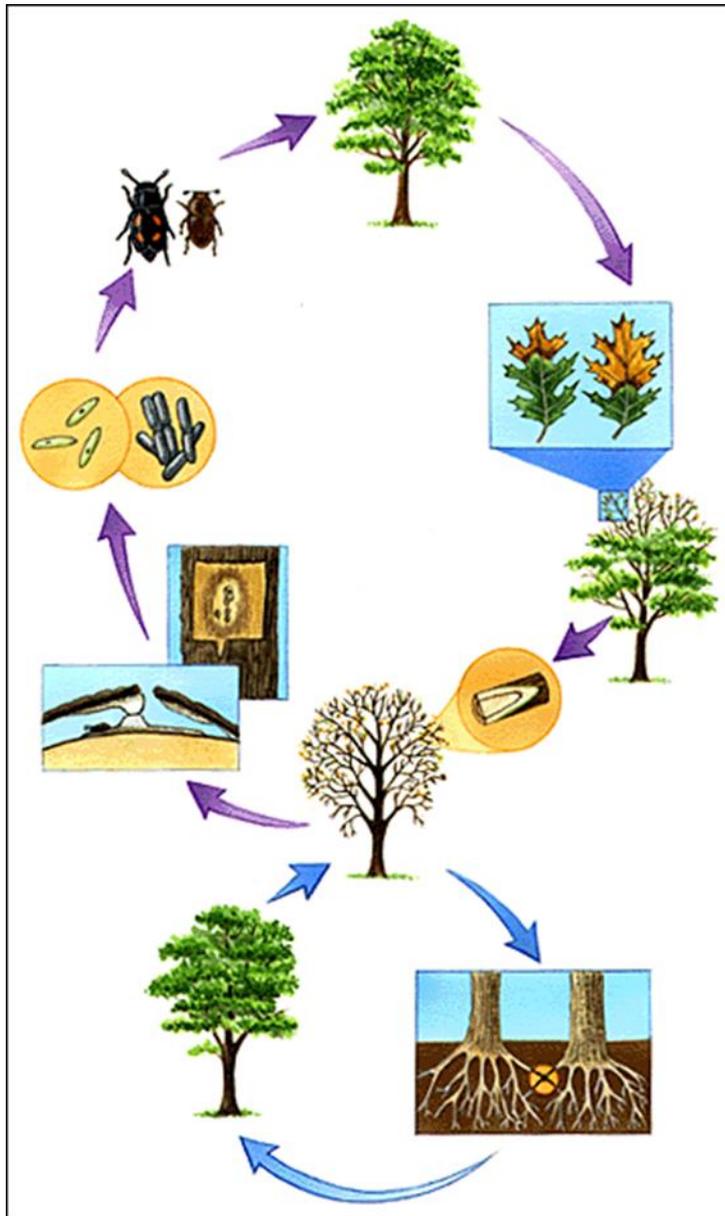
# Beetle vectors of Oak Wilt:



2-4 mm long

# Oak Wilt disease cycle:

- **Local spread between trees, creating an infection center**
  - Through root grafts
- **Overland spread, by insects carrying the fungus to susceptible/wounded trees**
  - Pressure pads AKA fungal mats, spore mats, spore pads



**Overland spread via insects**

**Local spread via root grafts**

# Oak Wilt: what to do

- **Prevent development of pressure pads/spore mats**
  - Prevent overland spread by insects
- **Remove infected trees**
  - Debarking, splitting, chipping, or drying the wood
- **Avoid injury to healthy trees**
- **Reduce root grafts**
  - Trenching or vibratory plow

# Other Disorders of Oak:

- **Bacterial leaf scorch**
  - Similar symptoms, but trees do not die quickly
- **Oak anthracnose**
  - Severe in cool wet springs; usually only a few dead branches in the crown
- **Twolined chestnut borer**
  - Larvae tunnel beneath bark; D-shaped exit holes

# Oak Wilt management:

- **No curative fungicides; best to prevent infection**
  - Prevent development of spore mats; prevent transfer of fungus to healthy trees
- **Control infection centers**
  - Disrupt root grafts; remove and chip/debark infected trees/stumps
- **Avoid wounding healthy trees**

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