

Sustainable Blackberry Disease Management

Damon L. Smith

Assistant Professor and State Extension Specialist
Department of Entomology and Plant Pathology, Oklahoma
State University



Accurate Diagnosis

- Submit sample to OSU Plant Disease Diagnostic Lab
- DO NOT send sample directly to me (I am notified when samples are submitted)
- Send a good sample!



Jennifer Dominiak-Olson, Plant Pathology Diagnostician
Contact:

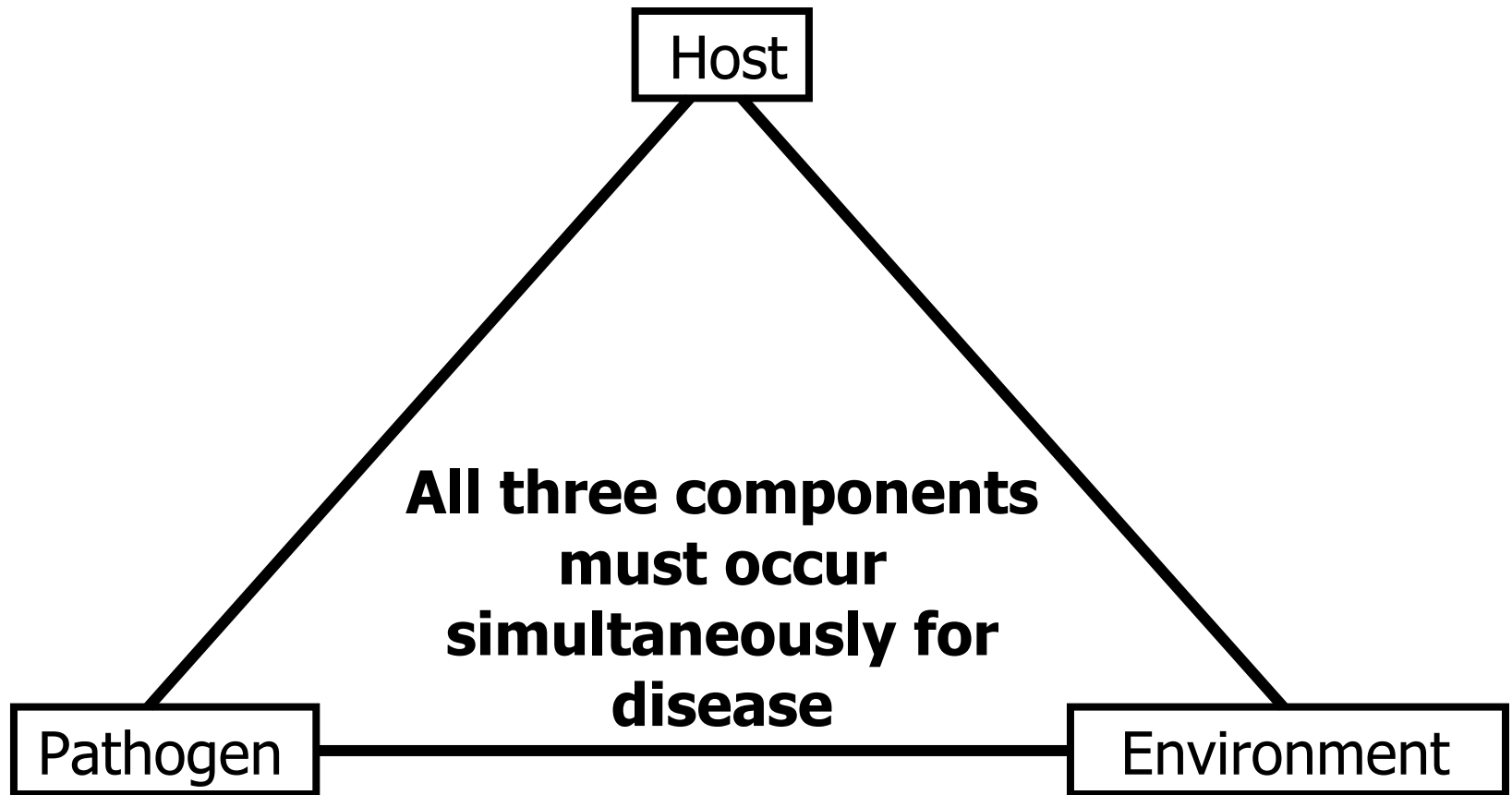
Room: 119 NRC Phone: (405) 744-9961 FAX: (405) 744-6039
<http://www.ento.okstate.edu/pddl/>

Blackberry Diseases in Oklahoma

- Anthracnose
- Cane blight
- Crown gall
- Botryosphaeria canker
- Orange rust
- Phytophthora root rot
- Rosette
- Nematodes



Plant Disease Triangle



Sustainable Disease Management – Planting Site

- Choose a site in the right location
 - Avoid wooded areas and shady places (Reduced risk for Anthracnose)
 - Well drained areas (reduced risk for *Phytophthora* associated problems)
 - Test soil for pathogens – e.g. nematodes



Sustainable Disease Management – Proper Site Preparation

- Install raised beds (Reduces risk of Phytophthora root rot)
- Mulch (Reduces drought stress)
- Install irrigation (Reduces drought stress)



Sustainable Disease Management – Cultivar Choice

	Rosette	Orange Rust	Anthracnose
Apache	R	R	R
Arapahoe	R	R	R
Chickasaw	S	R	Some Resistance
Kiowa		R	Some Resistance
Navaho	R	S	R
Oauchita	R	R	R
Shawnee	S	R	R
Prime Jim	None on Primocanes	R	Some Resistance
Prime Jan	None on Primocanes	R	Some Resistance

*Table borrowed from University of Arkansas

Sustainable Disease Management – “Clean” Planting Stock

- Disease free stock is less likely to have disease problems in the future
- Reduced risk for orange rust
- Reduced risk for crown gall



Sustainable Disease Management – Dormant Application of Organic Fungicides

- Lime-sulfur (only until shoots are $\frac{3}{4}$ " long)
 - Copper hydroxide (refrain if weather is very hot and humid)
- Reduced damage from Anthracnose and Cane blight



Sustainable Disease Management

- Start from the beginning and treat all diseases as important
- Make educated and informed decisions
- Ask questions



Fungal Disease

Anthracnose

Pathogen: *Elsinoe veneta*

Management: Refrain from overhead irrigation; improve airflow; avoid excessive nitrogen fertilization; prune and destroy infected plant material; Reduce wild populations of blackberries; dormant applications of lime-sulfur or copper hydroxide



Image from Mary Ann Hansen, VPI, IPMimages.com



Fungal Disease

Cane blight

Pathogen: *Leptosphaeria coniothyrium*

Management: Avoid wounding primocanes; Pruning wounds are the primary site of infection, use pinch pruning especially during summer pruning; Sanitation remove old floricanes after harvest; promote quick drying of foliage; adequate fertilization



Image from Phil Brannen, UGA



Fungal Disease



Botryosphaeria canker

Pathogen: *Botryosphaeria dothidea*

Management: Use disease free planting stock; Avoid wounding; establish new plants away from other fruit crops such as apple; avoid excessive nitrogen fertilization; thorned cultivars typically have better resistance than thornless cultivars



Fungal Disease

Orange rust



Image from Pat Zongoli, Clemson University, IPMimages.com

Pathogen: *Gymnoconia nitens*
(species that causes disease mainly to black berries)

Management: Use disease free planting stock; cultivar resistance; rogue canes and other plant material that have maturing pustules before they burst in the spring; improve air circulation and reduce canopy wetness



Fungal Disease

Rosette

Pathogen: *Cercospora rubi*

Management: Choose sites isolated from wild blackberries; use disease free planting stock; Sanitation – remove old floricanes and destroy after harvest; in severe situations mowing of floricanes and primocanes after harvest and removing canes is recommended



Image from Mary Ann Hansen, VPI, IPMimages.com



Oomycete Disease



Image from Christer Olson, Swedish Board of Agriculture
IPMimages.com

Phytophthora root rot

Pathogen: *Phytophthora spp.*

Management: Use disease-free planting stock preferably maintained in a greenhouse without field soil; choose sites that drain well; use raised beds; recent research has shown that soil solarization prior to planting reduced levels of the disease



Bacterial Disease

Crown gall

Pathogen: *Agrobacterium spp.*

Management: Good sanitation; purchase stock from reliable sources; avoid injuries; plant in well-drained soils; biocontrol agent *A. radiobactor* K84



Image from Mary Ann Hansen, VPI, IPMimages.com



Questions?

