Hemp Disease in Kentucky: Grasping the Reality of Yield Loss

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Hemp in KY

Hemp cultivation in Kentucky

- 2014- 32 acres planted
- 2018- approx. 7,000 acres planted
  - 18% grain, 4% fiber,
    62% CBD, 16% dual purpose
- 2019-
  - 56,000 acres approved
  - 2.9 M sq ft greenhouse approved
  - 109 processors approved
  - 1200 growers approved
- **26,500 acres planted**
- **92% CBD/cannabinoid**
No. Hemp is not disease-resistant.
Confirmed Reports of Diseases of Kentucky Hemp

- Anthracnose
- Botrytis Gray Mold
- Botrytis Canker
- Cercospora Leaf Spot
- Corynespora Leaf Spot
- Downy Mildew
- Fusarium Foot & Root Rot
- Fusarium Head Blight
- Fusarium Wilt

- Hemp Leaf Spot (Bipolaris Leaf Spot)
- Powdery Mildew
- Pythium Root Rot
- Rhizoctonia Damping Off
- Rhizoctonia Web Blight
- Rhizoctonia Stem & Root Rot
- Septoria Leaf Spot
- Southern Blight
- White Mold, Sclerotinia Rot
Greenhouse Disease vs Field Disease
Greenhouses
Diseases
Primary Greenhouse Diseases

- **Powdery Mildew**
- Botrytis Canker
- Pythium Root Rot
- Downy Mildew

*Golovinomyces spadiceus*

Not *Sphaerotheca macularis* or *S. humuli*, as reported
Primary Greenhouse Diseases

- Powdery Mildew
- Botrytis Canker
- Botrytis Tip Blight
- Pythium Root Rot
- Pythium Damping Off
- Downy Mildew

*B. cinerea*
Primary Greenhouse Diseases

- Powdery Mildew
- *Botrytis Canker*
- *Botrytis Tip Blight*
- Pythium Root Rot
- Pythium Damping Off
- Downy Mildew

*B. cinerea*
Primary Greenhouse Diseases

- Powdery Mildew
- Botrytis Canker
- Botrytis Tip Blight
- Pythium Root Rot
- Pythium Damping Off
- Downy Mildew

*P. myriotylum*

*P. ultimum var ultimum*
Abiotic Maladies

New and inexperienced growers
Fertility – deficiencies and toxicities
Irrigation – overwatering

Too Late: Unidentified Pathogens
• Secondary
• Saprophytic
Field Diseases
Primary Field Diseases

Leaf Spots

- Anthracnose Leaf Spot
- Cercospora Leaf Spot
- Hemp Leaf Spot
- Septoria Leaf Spot
- Corynespora Leaf Spot

*Colletotrichum fioriniae*

Hosts: apple, blueberry, strawberry, celery, clover, dandelion, honeysuckle, poison ivy, wild grape
Primary Field Diseases

Leaf Spots
• Anthracnose Leaf Spot
• **Cercospora Leaf Spot**
• Hemp Leaf Spot
• Septoria Leaf Spot
• Corynespora Leaf Spot

*Cercospora flagellaris*

Hosts: soybean, aster, amaranth, cosmos, hydrangea, poplar, johnsongrass, citrus, water hyacinth
Primary Field Diseases

Leaf Spots
- Anthracnose Leaf Spot
- Cercospora Leaf Spot
- **Hemp Leaf Spot** (Bipolaris Leaf Spot)
- Septoria Leaf Spot
- Corynespora Leaf Spot

*Bipolaris gigantea*

Hosts: monocots
Primary Field Diseases

Leaf Spots
- Anthracnose Leaf Spot
- Cercospora Leaf Spot
- **Hemp Leaf Spot**
- Septoria Leaf Spot
- Corynespora Leaf Spot

*Bipolaris gigantea*
Hosts: monocots
Primary Field Diseases

Leaf Spots
- Anthracnose Leaf Spot
- Cercospora Leaf Spot
- Hemp Leaf Spot
- Septoria Leaf Spot
- Corynespora Leaf Spot

*Septoria* species undetermined
Groups near *S. sigesbeckiae*
Morphologically similar to *S. neocannabina*
Primary Field Diseases

Blightes and Molds

- Botrytis Gray Mold
- Fusarium Canker
- Fusarium Head Blight
- Fusarium Wilt
- Rhizoctonia Aerial/Web Blight

F. graminearum and
F. solani complex
Primary Field Diseases

Blight and Molds

- Botrytis Gray Mold
- Fusarium Head Blight
- **Rhizoctonia Aerial/Web Blight**

*R. solani*
Primary Field Diseases

Root and Crown Rot
- Fusarium Damping Off
- Fusarium Crown Rot
- Pythium Root Rot
- Pythium Damping Off
- Rhizoctonia Damping Off
- Southern Blight
- White Mold/Timber Rot

*S. rolfsii*
Abiotic Maladies

Experimental Crop
New and inexperienced growers
Unstable market

• Poor Site
• Poor Planting
• Weak Stock
• Weeds
Managing Greenhouse Diseases

- Sanitation
  - Transmission
  - Rouging
- Environment
  - Relative Humidity
  - Soil Moisture
  - Air Circulation
  - Temperature – air & soil
- Plant Vigor
  - Prevent Wounding
  - Soil and Tissue Analysis
  - Control Insects
- Fungicides - biologicals
  - EPA list
  - State-registered
Managing Field Diseases

• Site Selection, Site Prep
  • Drainage (internal and surface)
  • Fertility
  • Weed Management

• Sanitation
  • Clean Plants
  • Rouging

• Environment
  • Air Circulation

• Plant Vigor
  • Healthy Stock Plants/Seeds
  • Prevent Wounding
  • Soil and Tissue Analysis
  • Control Insects
  • Timing
Risks for Yield Loss

- Disease
- Time of Infection
- Pathogenicity
- Environment/Weather
- Plant Health, Resilience
Questions and Considerations

• Primary disease?
• Secondary disease?
• Saprophytic pathogen/disease?
• Preventable problem?
• Abiotic or cultural problem?
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