

Sclerotinia Stem and Crown Rot of Alfalfa: Symptoms & Disease Cycle

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Sclerotinia stem and crown rot aka "white mold"



White fungal mycelium grows and is visible ,as shown in the photo,
when there is humidity in the canopy

Sclerotinia Signs & Symptoms



White mycelium (a "sign") on dead stems (a "symptom")

Sclerotinia stem and crown rot



Infected stems are very light tan in color and usually soft and weak .

Sclerotinia stem and crown rot symptoms



Dead stems are a symptom of infection by *Sclerotinia*. For definitive diagnosis, look for sclerotia on, or in, infected stems (see the next slide for sclerotia).

Sclerotia are formed by the fungus when it is out of food or when the environmental conditions become unfavorable (e.g. too hot or too dry). Sclerotia are a survival structure. Sclerotinia survives the summer as sclerotia in soil.



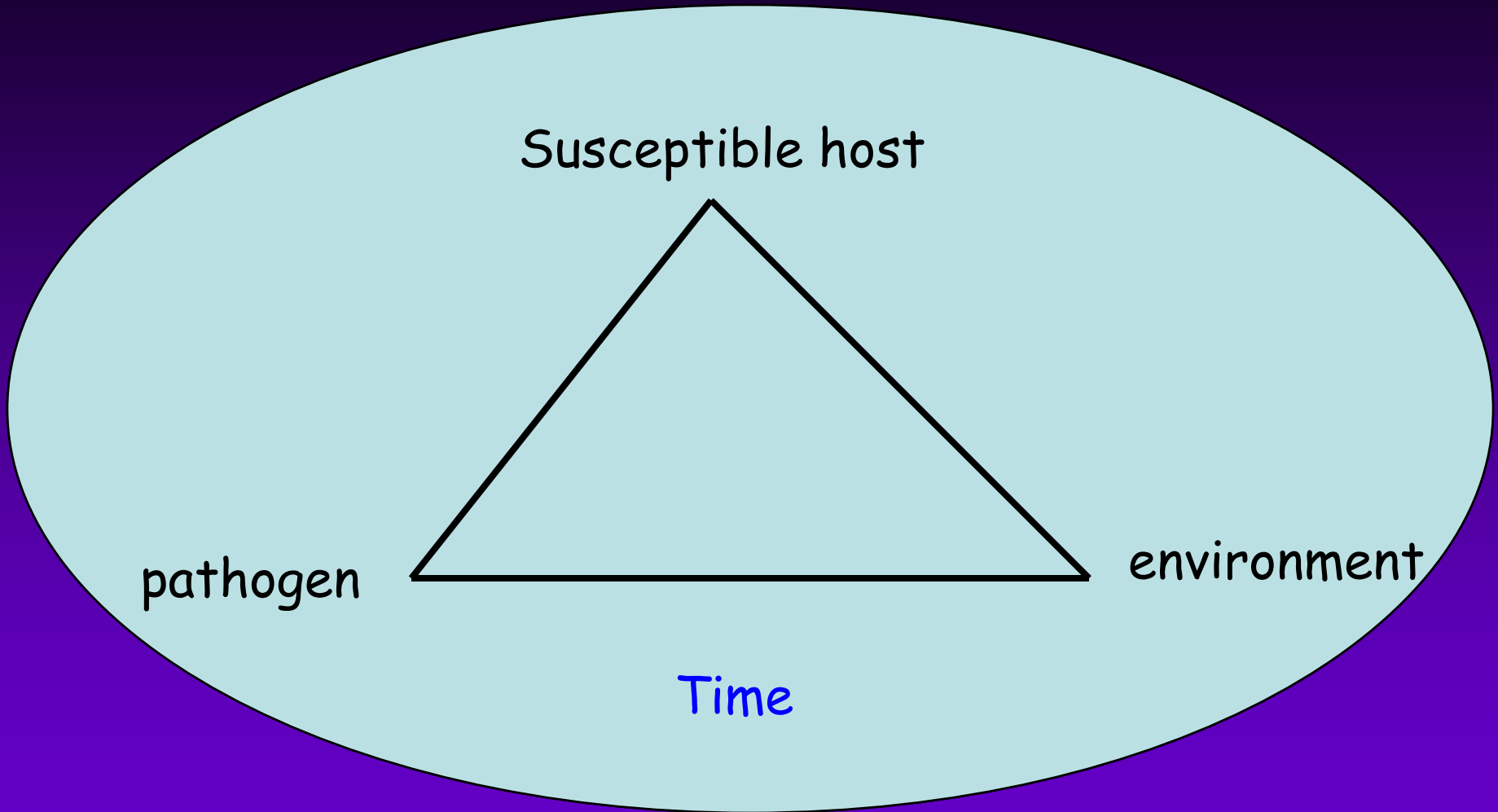
sclerotia is plural,
sclerotium is singular

More symptoms of Sclerotinia stem and crown rot



Widespread infection caused by a "shower" of airborne spores

Disease Triangle



For disease to develop, there must be a susceptible host, the pathogen must be present, and the environment has to be "right" for that particular disease.

Sclerotinia Stem and Crown Rot

Susceptible Host

All alfalfa varieties appear susceptible.

When plants have a full canopy that traps moisture/humidity, disease is more likely to develop than when plants are small, been burned back by a herbicide, or been recently harvested.

Sclerotinia Stem and Crown Rot

Environment

- Moderate temperatures - "cool"
- High humidity
 - Rain
 - Fog
 - Dew
 - Role of canopy (a dense canopy traps moisture and humidity and favors disease development)

Sclerotinia Stem and Crown Rot

Pathogen

- *Sclerotinia trifoliorum*
- *Sclerotinia sclerotiorum*

May not make much difference what species;
 Most samples in the Tulare/Kings/Fresno area
 are *S. trifoliorum*.

Temperature optimums for the two species may
 be slightly different and there are differences
 in host range.

Life Cycle of *Sclerotinia*

- Mycelium - visible growth of fungus
 - Active growing stage



Life Cycle of Sclerotinia sp.

- Strands of fungus: "mycelium"
Active growing stage
- Survival structure: sclerotium (singular)
Sclerotia (plural) formed by mycelium when there is no food left or the environment is not favorable



The fungus survives summer as sclerotia in soil.



Life Cycle of Sclerotinia sp.

- Strands of fungus: "mycelium"
 - Active growing stage
- Survival structure: sclerotium
 - Formed when there is no food or the environment is not favorable
- **Reproductive structure: apothecium**
 - Apothecia (plural) are produced by sclerotia
 - Apothecia produce hundreds of thousands of spores which act as "seeds" by germinating to start new infections on susceptible hosts

Life Cycle of Sclerotinia sp.

Apothecia



Apothecia are produced by sclerotia in the fall when soil temperatures have dropped and the soil is wet.

Life Cycle of Sclerotinia sp.

Apothecia

This apothecium came from a sclerotium in the soil.



Spores ejected into the air by apothecia.

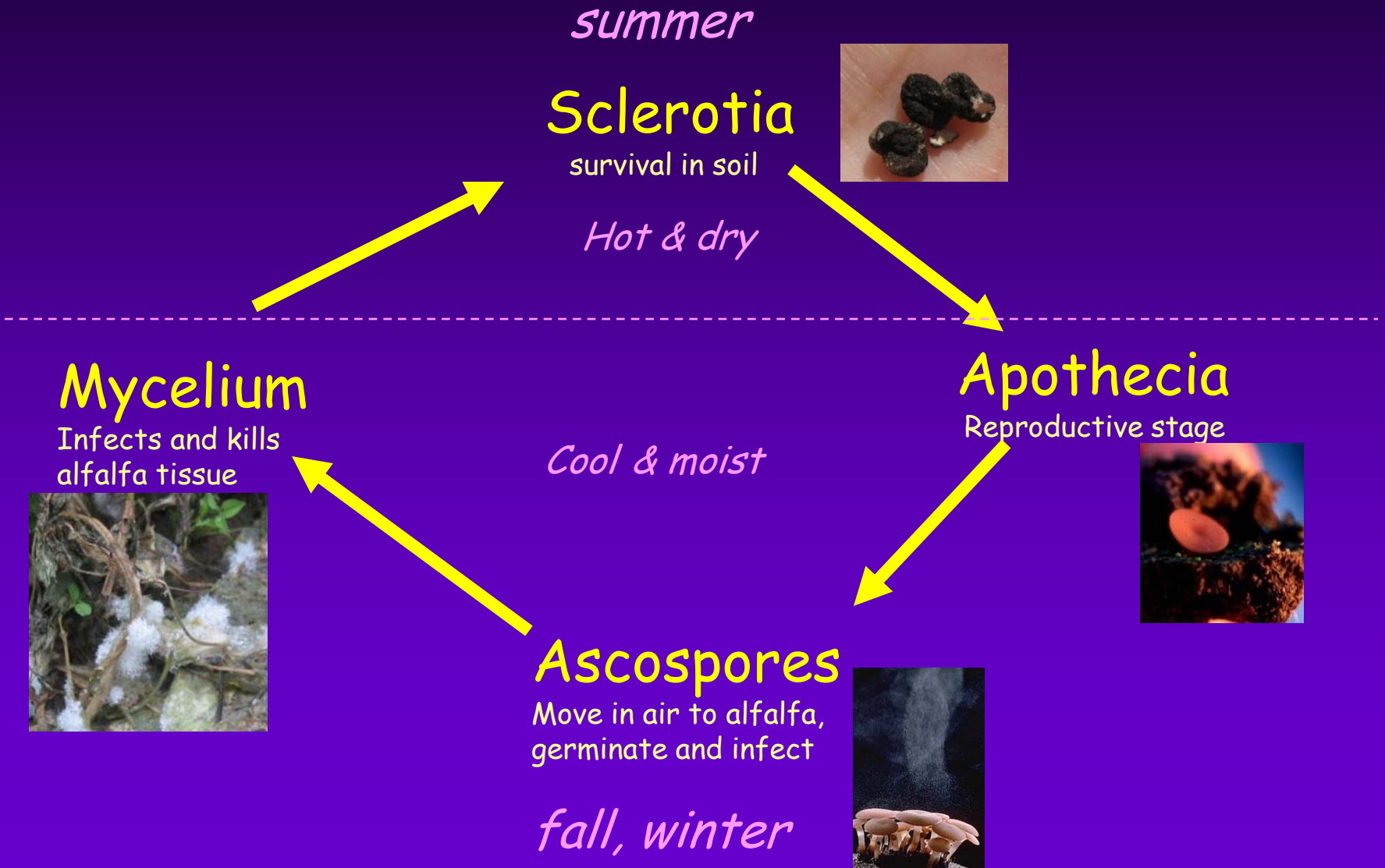


These apothecia formed from a sclerotium in an old alfalfa stem.

Life Cycle of Sclerotinia sp.

- Strands of fungus: "mycelium"
 - Active growing stage
- Survival structure: sclerotium
 - Produced by mycelium when there is no food or the environment is not favorable
- Reproductive structure: apothecium
 - Formed by sclerotia and produce thousands of spores which germinate to form mycelium

Disease Cycle of *Sclerotinia*



Control Strategies

- Reduce canopy to reduce humidity
 - Late harvest to remove crop canopy
 - Delay planting new fields (but this reduces yield)
 - Control weeds to reduce humidity in the canopy
- Fungicide Application

Fungicide

- Pristine
 - Active ingredients are boscalid + pyraclostrobin
 - Now registered on alfalfa in CA; Maximum rate is 18 oz/A
- In some trials reduced disease, increased yields, & improved stand
- Effectiveness depended on disease levels and timing of application (in trials with little disease, there was less benefit)
- Treat at first sign of disease if fog is forecast; late applications are less beneficial