

Oomycetes (water molds)

- Diploid (2N)
- Hyphae are coenocytic (tubes)
- Cell wall made of cellulose
- Sexual reproduction: **oospore**
- Asexual reproduction: **sporangia** and **zoospores**



Websites to brush up on Oomycete diseases

- Overview of Oomycetes
<http://www.apsnet.org/education/LabExercises/Oomycetes/Top.html>
- Phytophthora root rot of soybean
<http://www.apsnet.org/education/LessonsPlantPath/PhytophthoraSojae/Default.htm>
- Late Blight of Potato/Tomato
<http://www.apsnet.org/education/LessonsPlantPath/LateBlight/default.htm>
- Downy mildew of grape
<http://www.apsnet.org/education/LessonsPlantPath/GrapeDowny/default.htm>

Oomycete videos

- Pythium root rot of cereals
<http://www.youtube.com/user/plantdisease>
- *Phytophthora ramorum* sporangia and zoospores
<http://www.youtube.com/watch?v=rTo6UwnZiQg>

Apple scab disease cycle video

Things to look for:
overwintering?

how is a new infection cycle initiated?

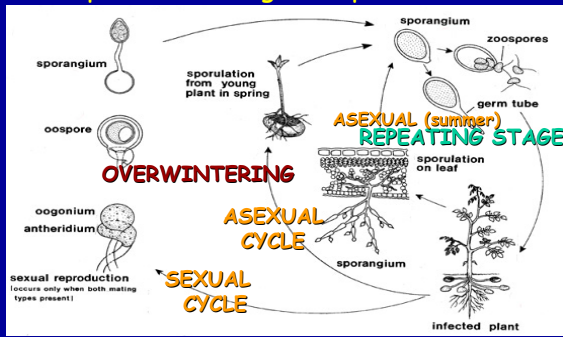
is there a secondary (summer) cycle of reproduction?

are spores formed by sexual or asexual processes?

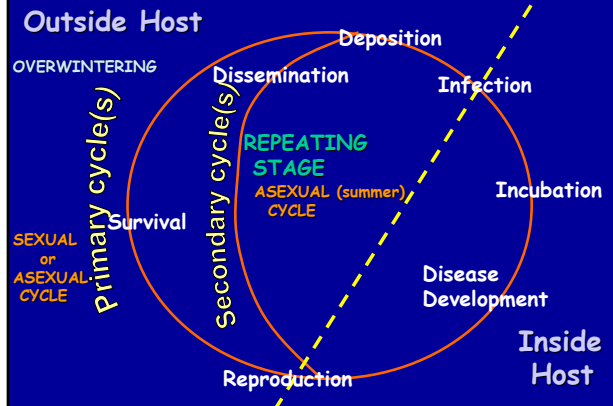
which spore type is most important economically?

Lecture 5: Disease Cycles

Example 1: Late blight of potato



Generic Disease cycle

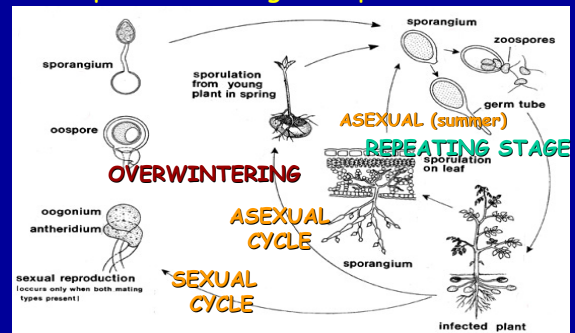


Disease cycle diagrams provide useful information, **BUT** what information is difficult to obtain from the drawings?

- A weighting of the practical significance of the various steps, cycles, and subcycles
- A sense of the length of time required by various steps, cycles, and subcycles.

Lecture 5: Disease Cycles

Example 1: Late blight of potato



Terms associated with disease cycles

Primary inoculum – infectious propagule, usually from an overwintering source, that initiates/perpetuates the primary disease cycle, as opposed to infectious propagules spread disease during the season.

For fungal and oomycete pathogens, *if* a sexual spore is involved in the disease cycle, it typically serves as (e.g., ascospore) or gives rise to (oospore to zoospore) the primary inoculum.

disease cycle terms continued

Secondary inoculum – infectious propagules that were produced by infections that took place during the same growing season

- this type of inoculum is nearly always asexual, and the infectious propagules are relatively short-lived

disease cycle terms continued

Monocyclic disease – a disease where infections are caused by primary inoculum only

- Soilborne diseases are commonly monocyclic
- The timing of individual infections can still vary

disease cycle terms continued

Polycyclic disease – a disease where one to many cycles of infection are initiated by secondary inoculum

- Many foliar diseases (e.g., powdery mildews and rusts of grasses) are polycyclic

disease cycle terms continued

Terms that address the 'TIME REQUIRED' issues – they relate to the period after infection but before symptom expression

- Incubation period- the time between infection and symptom expression – typically regulated by temperature
- Latent period – similar to incubation period, it is time the time from infection to new spore production – the latent periods governs the *speed* of increase of polycyclic diseases
- Quiescent infections- inactive, symptomless, microscopic infections – important in many fruit rots and seed-borne diseases

