



How Cool Are Fungi?

Dr. Nicole Gauthier
University of Kentucky
Department of Plant Pathology

Photo: Curtis Young, Ohio State University



Plant Pathology

Interaction between plant pathogens and host plants.

Study of plant disease

Plant Pathogens:

- Fungi
- Bacteria
- Viruses
- Water molds
- Nematodes



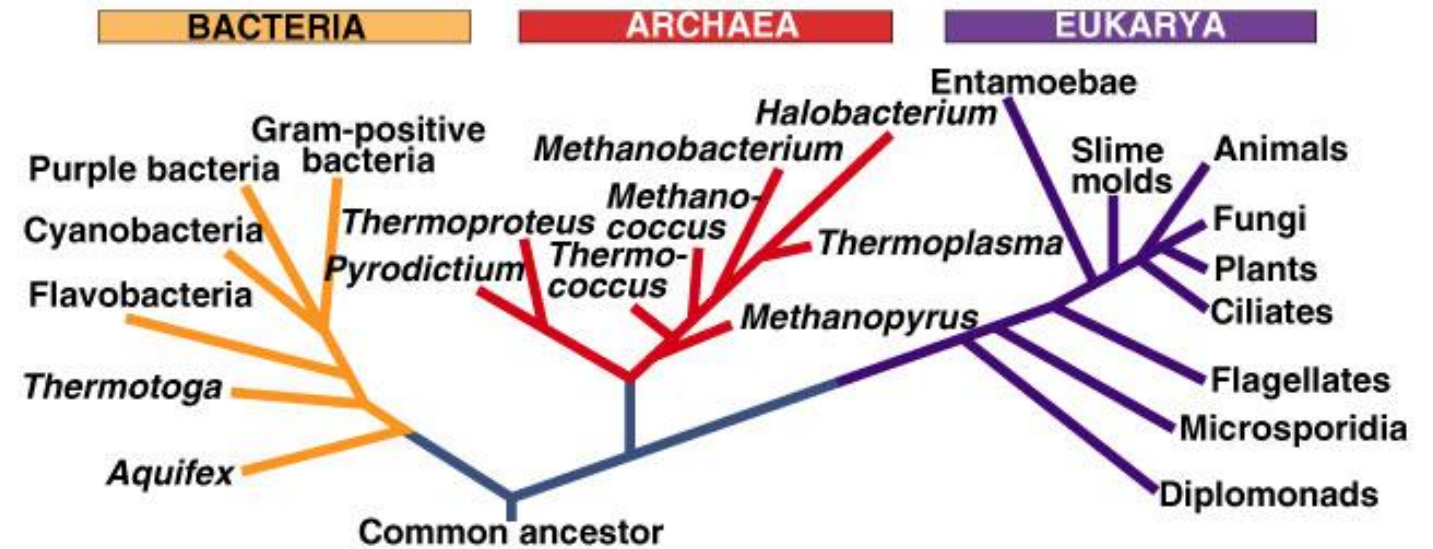
Fungi... The Fun Guy

More closely related to animals than plants

Ancient group

- Fossil record indicates fungi 460 million years old
- Molecular data suggest >1 billion years old
- Bacteria 3.5 billion years old
- Plants 425 million years old

Photo web.augsburg.edu



Strength in Numbers

- 85% plant diseases are fungal
- 1,500,000 fungal species, but only 100,000 species described
- 250,000 plant species (6x more fungi than plant species)

Photo: Kim Leonberger, University of Kentucky



Fungi or “Fungi”

True Fungi,

- Kingdom Fungi

Oomycetes

- Kingdom Chromista

Slime molds

- Kingdom Protista



Food for Fungi

Energy from other sources – heterotrophic

Decomposers, parasites, pathogens, or symbionts.

- Biotroph – from living hosts
- Necrotroph – kill host cells
- Saprotroph – from dead or decayed hosts



Entomopathogens

Parasitize insects

- Zombie ants
- Biocontrol

Photo: Wikipedia, madonscience.blogspot.com



Animal Parasites

White nose bats

Frog killer

Yeast

Histoplasmosis

Aspergillus

Photo Summit Environmental Solutions



Plant Diseases

- Leaf spots
- Molds
- Cankers
- Wood rots
- Root rots





Plant Diseases

Leaf spots

Plant Diseases

Molds

Mildews



Plant Diseases

Cankers



Plant Diseases

Wood rots

Photo Bugwood, Joseph O'Brien, US Forest Service



Plant Diseases

Root rots

Photo Elizabeth Bush, Virginia Polytechnic Institute and State University



Saprobies

Mulch fungi

Slime molds

Photo Gary Emberger, Messiah College



Saprobies

Mulch fungi

Slime molds

Photos: Cheryl Kaiser and John Hartman, University of Kentucky

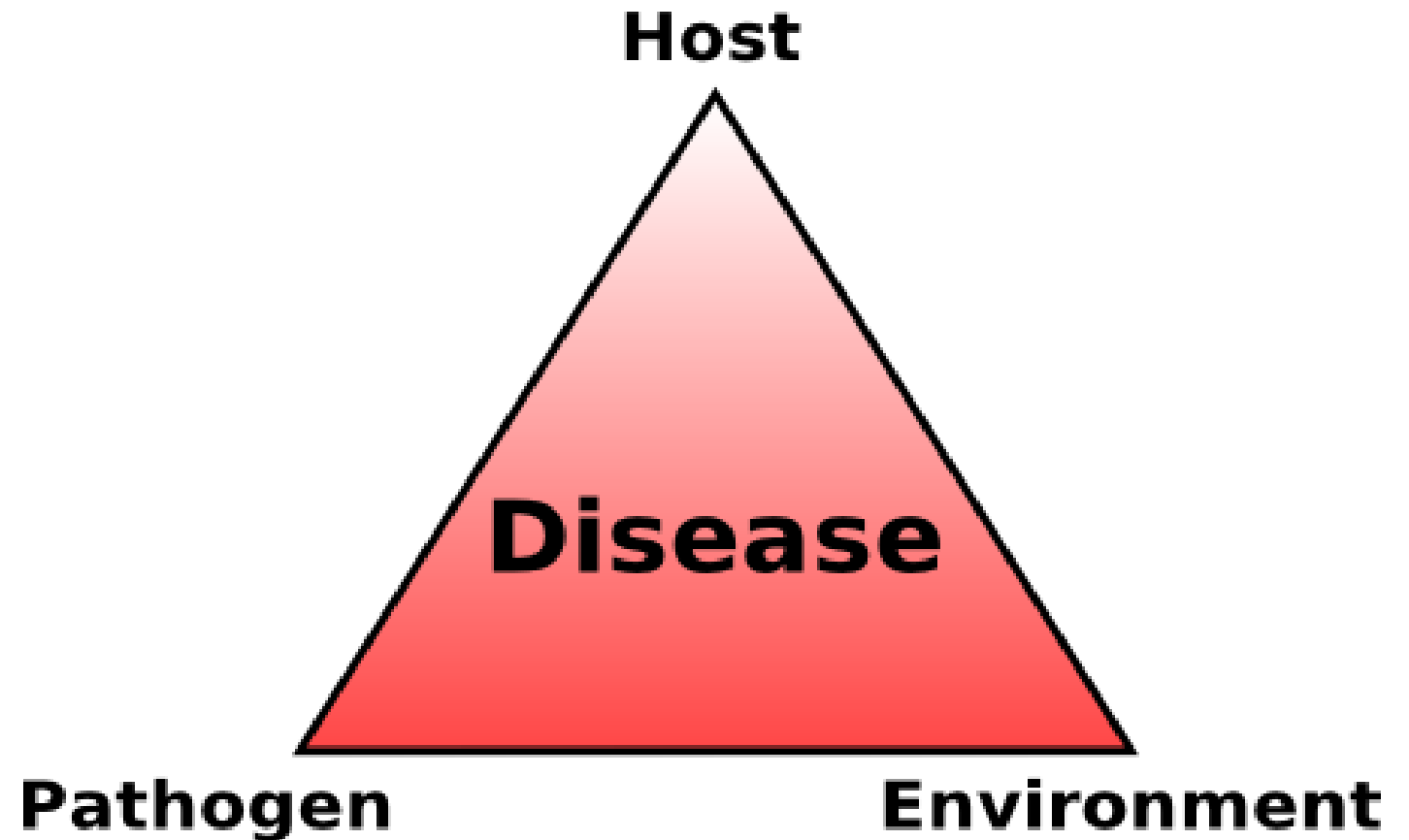


Life Cycles

Disease Triangle

- Host
- Pathogen
- Environment
 - Free Water
 - Moderate Temperatures

Photo Ed Zaborski, University of Illinois



Life Cycles

Survival

Overwintering



Plant Disease Management

Does the disease need to be managed?

Cultural Practices

- Water management
- Sanitation
- Resistant cultivars
- Rotation

Fungicides

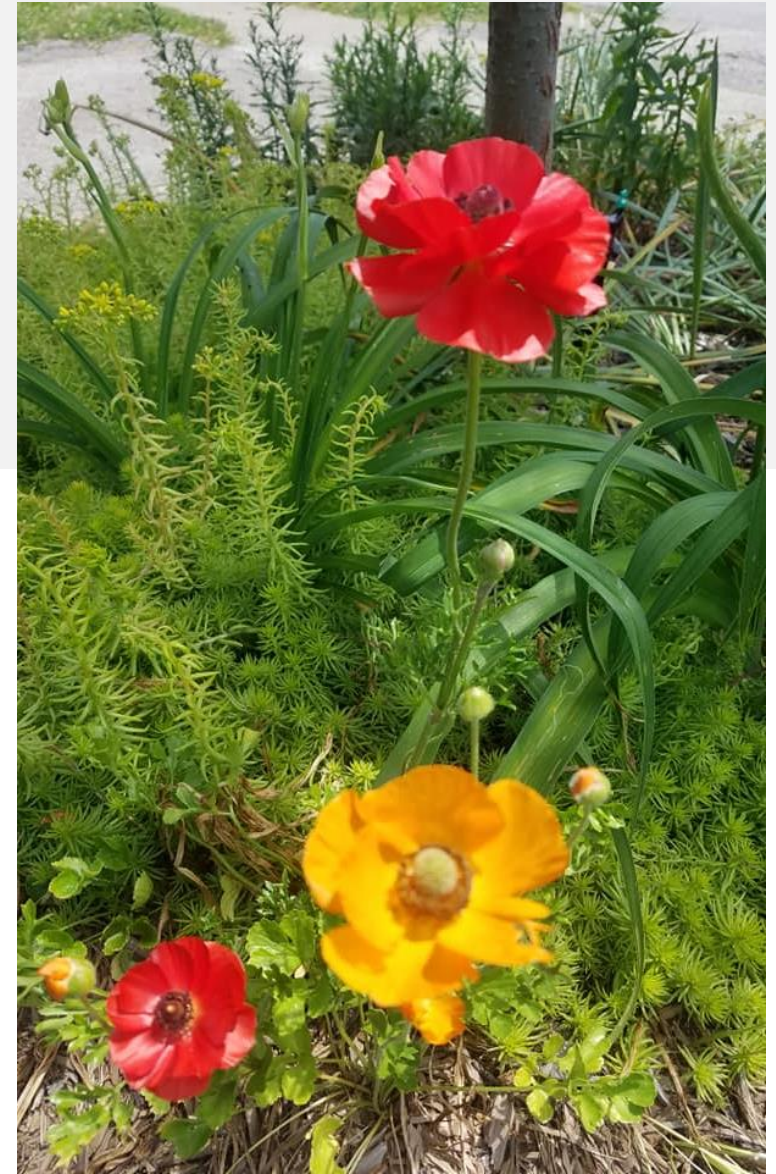
- Preventative

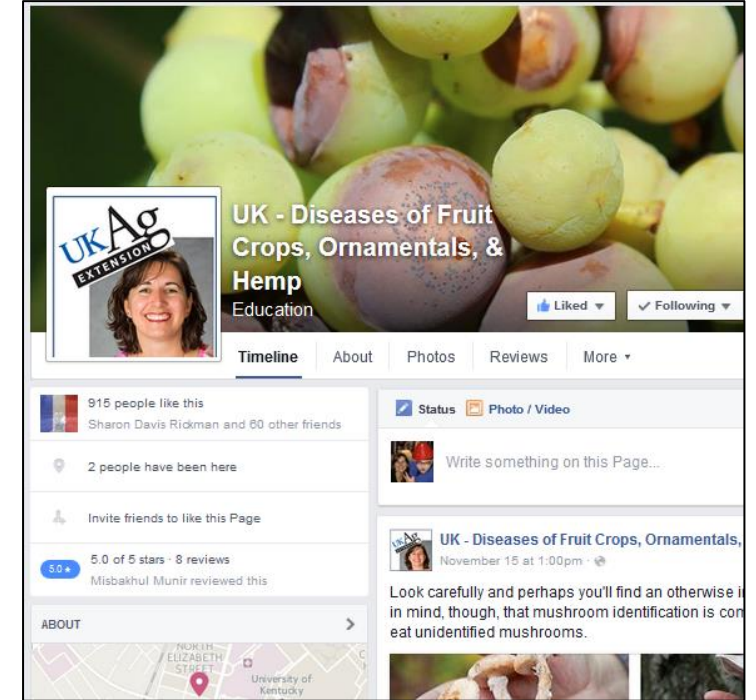
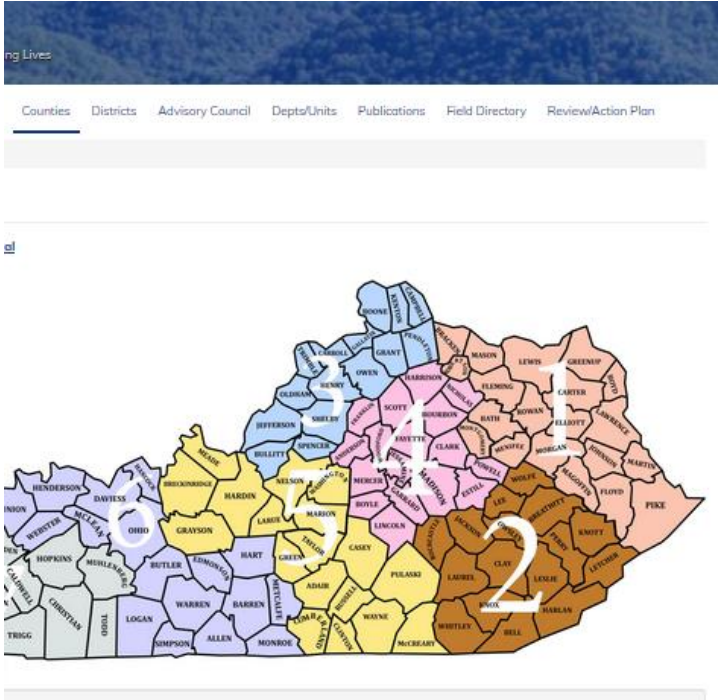




Biodiversity

- Consider no management
- Protection of beneficials





Resources

