

CYTOSPORA CANKER MANAGEMENT IN MESA COUNTY, CO

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PROJECT INTRODUCTION

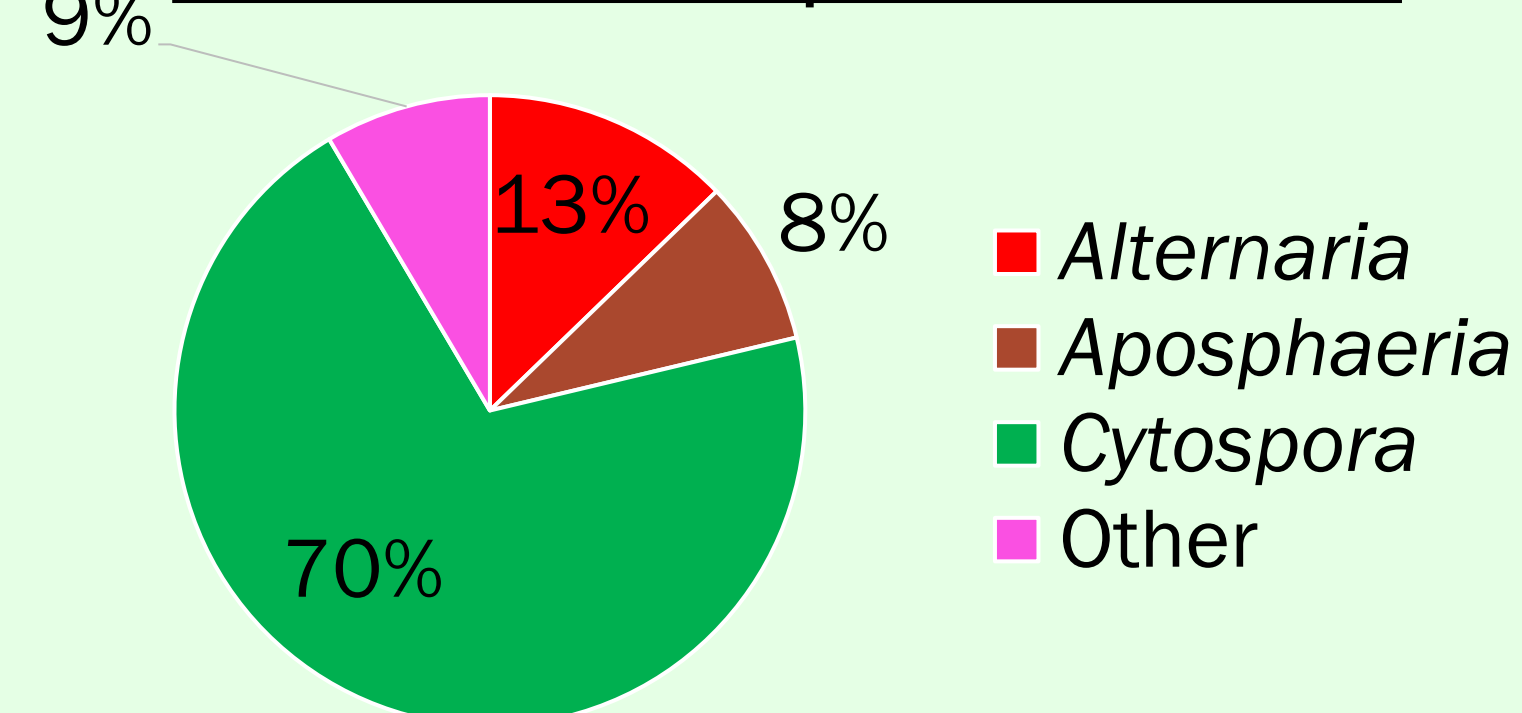
- Growers in Colorado are currently dealing with high rates of Cytospora canker, which is having a discernible impact on orchard establishment, management, and productivity.
- A survey was conducted in apple, cherry and peach orchards to identify fungal communities present and the roles the organisms fill.

INTERNSHIP GOALS

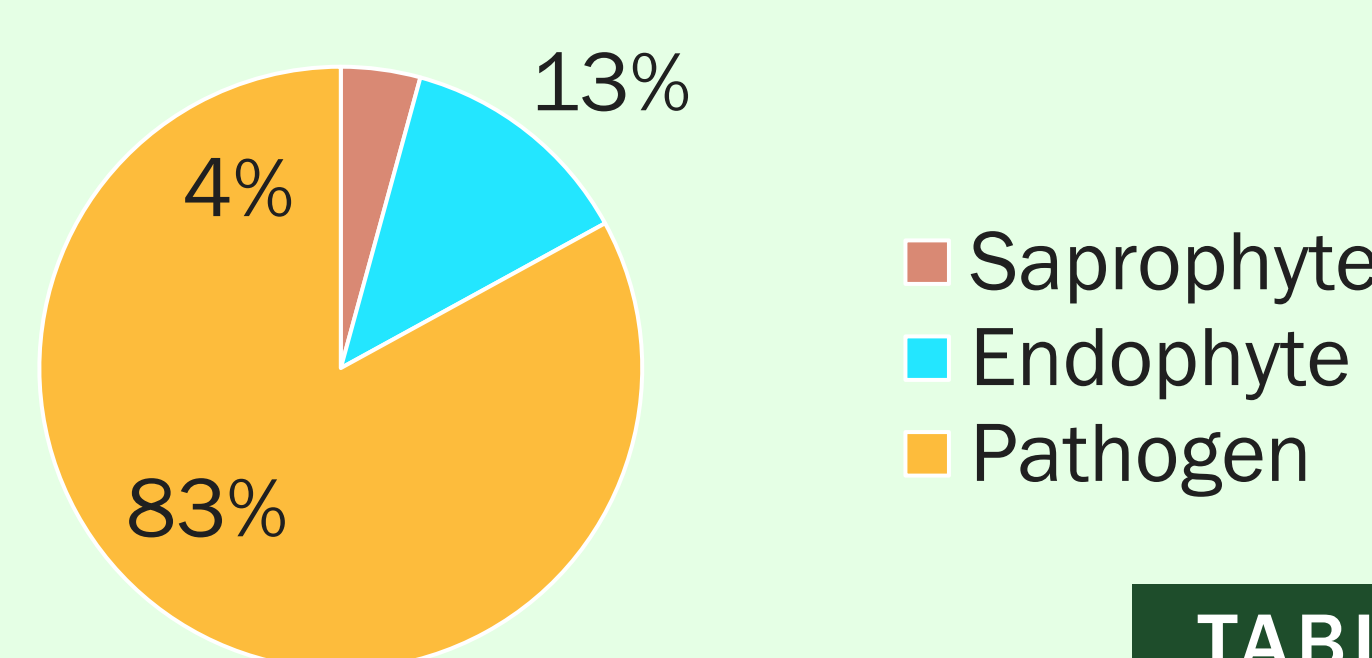
- Investigate the natural diversity of fungal organisms present in apple, cherry, and peach orchards and determine their impact on host species.

FUNGAL DIVERSITY FOUND ON SYMPTOMATIC TISSUE

Genus All Samples Collected



Life Style of All Samples Collected



WHAT YOU DID

Collected and isolated suspected pathogens from unhealthy trees at Orchard Mesa Research Station.

- Inspected trees in peach, cherry, and apple orchards for signs of disease.
- Cultured and isolated diseased tissue from samples.
- Maintained PDA cultures of isolates.

Used Molecular tools to identify samples.

- Extracted Fungal DNA using the Chelex method.
- Conducted PCR to amplify the ITS region.
- Confirmed amplification of target region with gel electrophoresis.
- A total of 52 samples were then cleaned using Exo-sap and sent for DNA sequencing.
- NCBI Blast was used to identify genus and species.

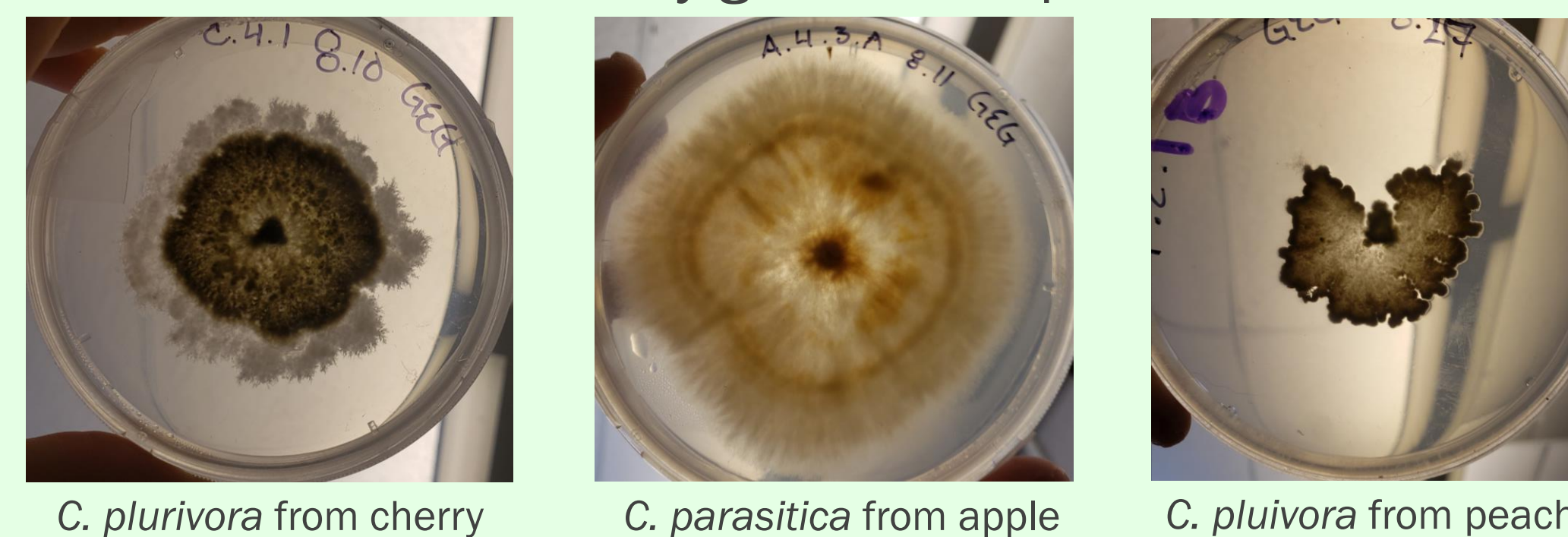
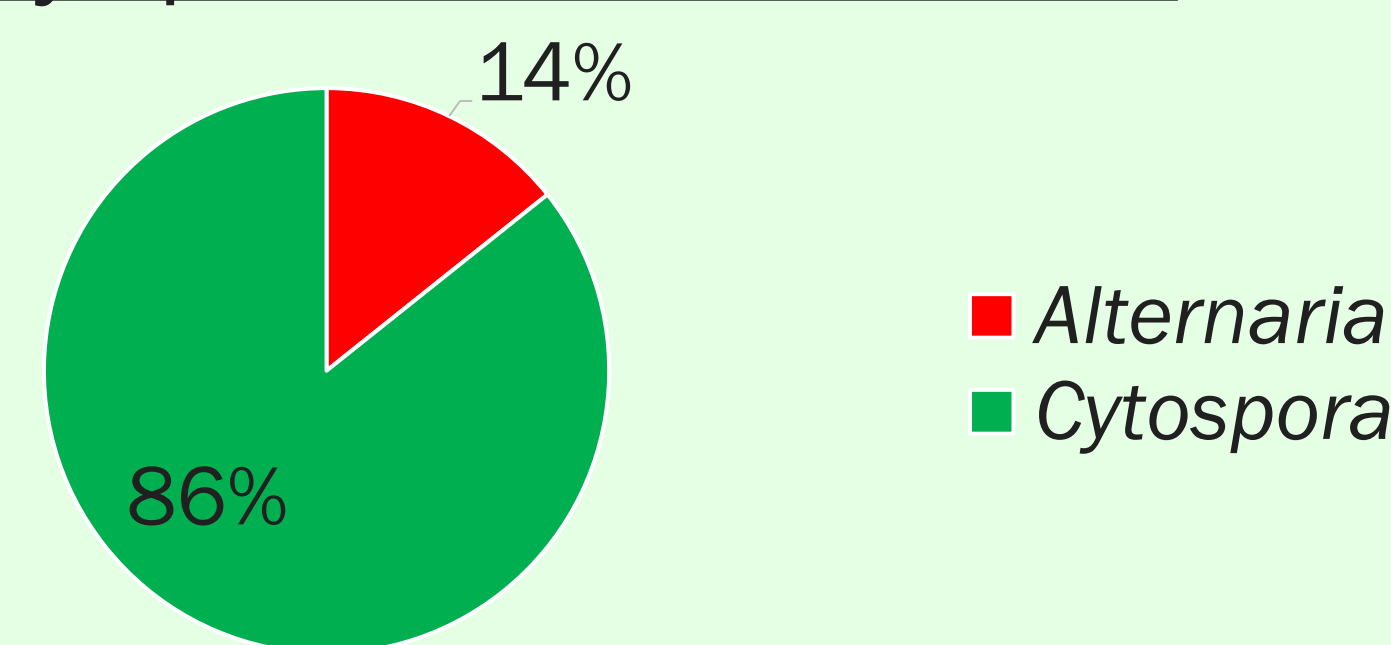


TABLE - FUNGAL GENUS BY HOST

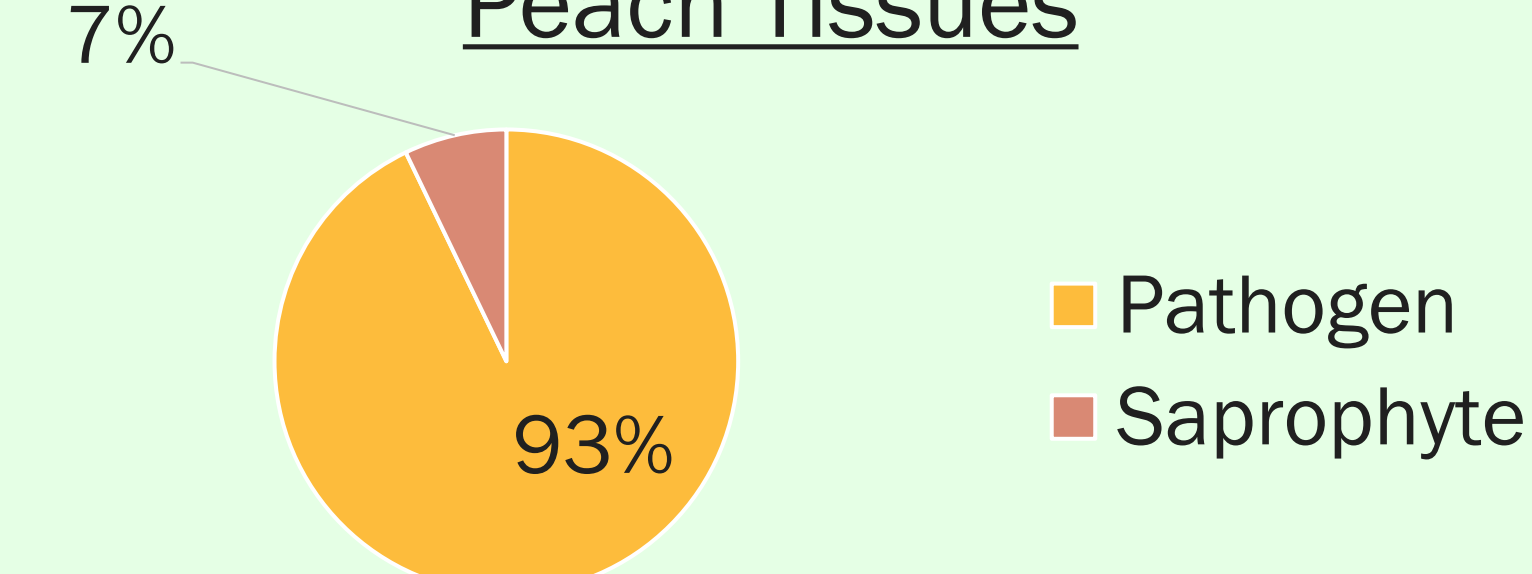
| Genus | Apple | Cherry | Peach |
|----------------------|-------|--------|-------|
| <i>Alternaria</i> | 3 | 1 | 2 |
| <i>Aposphaeria</i> | 4 | - | - |
| <i>Aureobasidium</i> | 1 | - | - |
| <i>Cytospora</i> | 8 | 13 | 12 |
| <i>Mucor</i> | 1 | - | - |
| <i>Fusarium</i> | - | 1 | - |
| <i>Preussia</i> | - | 1 | - |

FUNGAL DIVERSITY FOUND ON SYMPTOMATIC PEACH TISSUES

Genus of organisms found on Symptomatic Peach Tissues



Life Style of organisms found on Symptomatic Peach Tissues

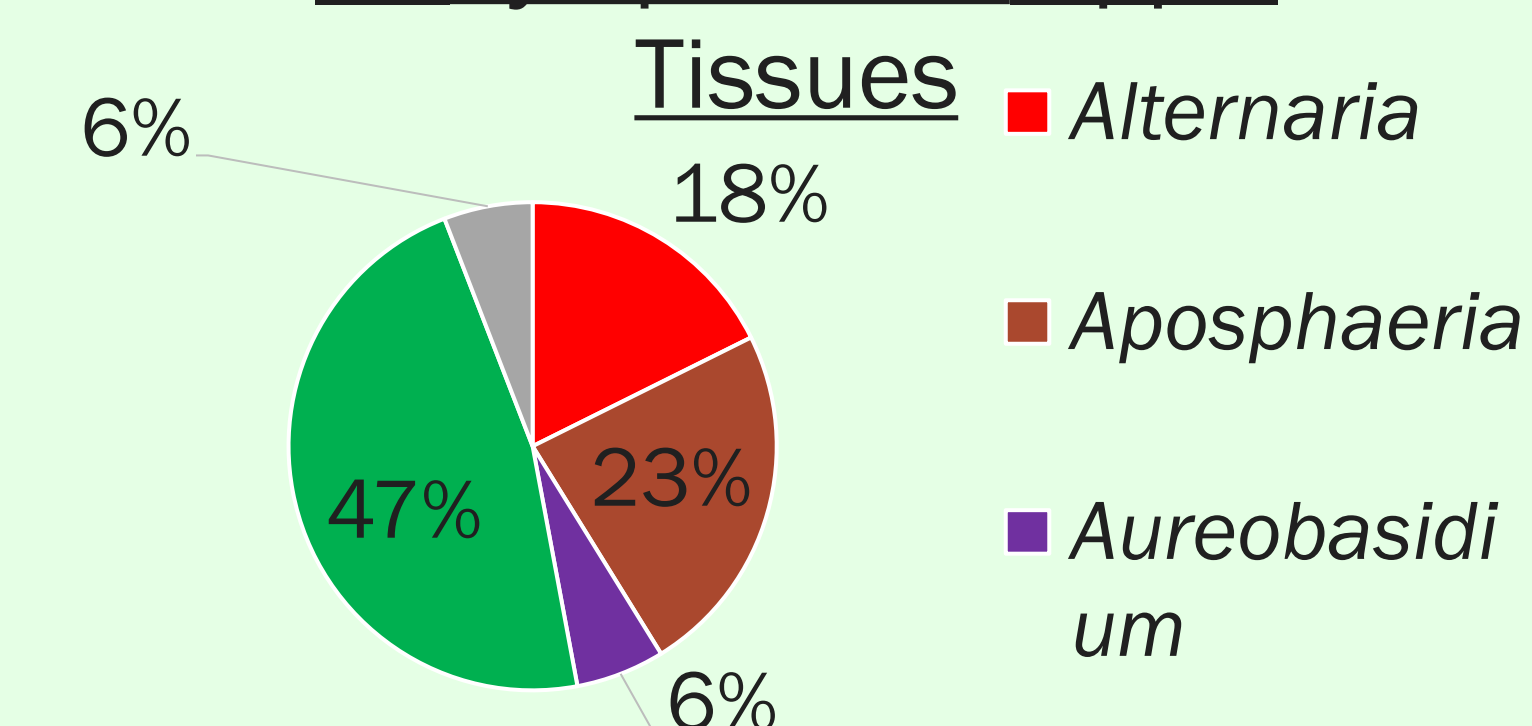


TAKE AWAYS

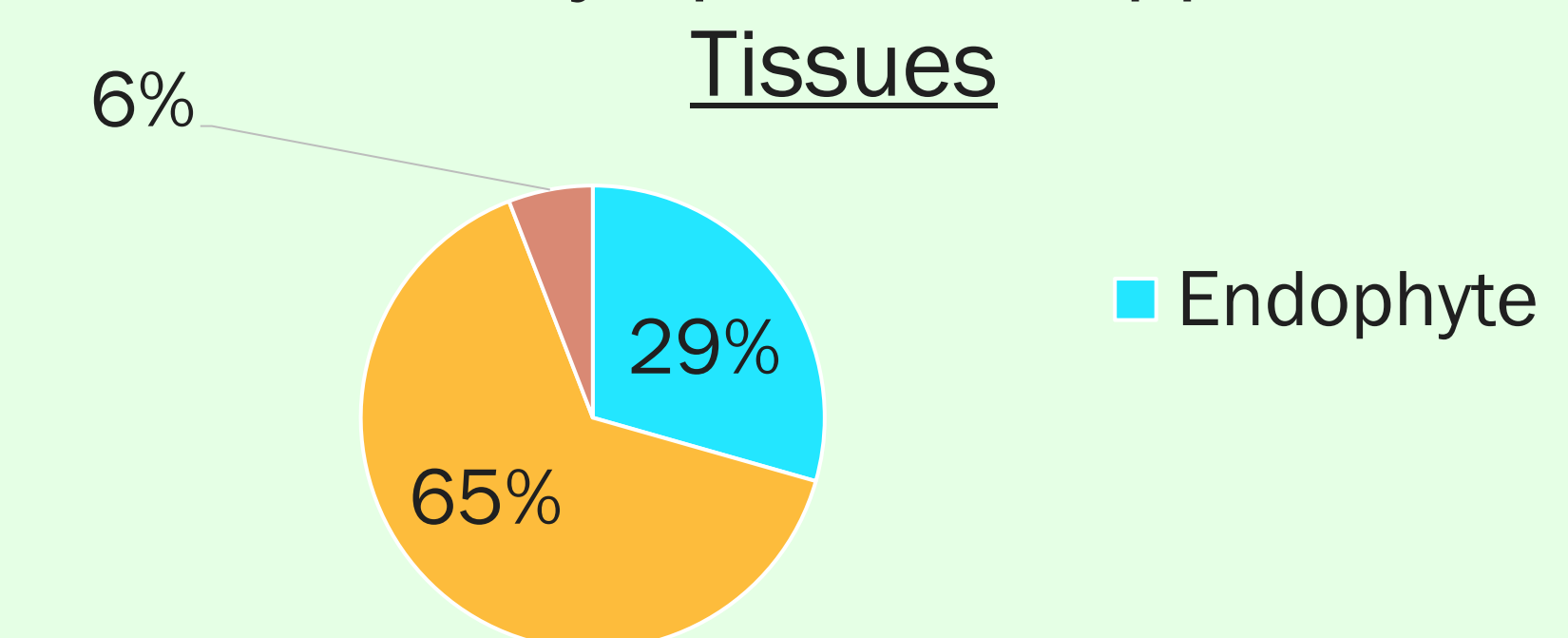
- Identifying fungal communities present in orchards is the first step to determining effective IPM strategies.
- Fungal pathogens are difficult to manage once a tree has been infected.
- Fungal communities present in apple, cherry and peach orchards are diverse and not all are fungi sampled are pathogenic.
- There is a lot of diversity within genera of many organisms present, including four species of *Cytospora*.

FUNGAL DIVERSITY ON SYMPTOMATIC APPLE AND CHERRY TISSUE

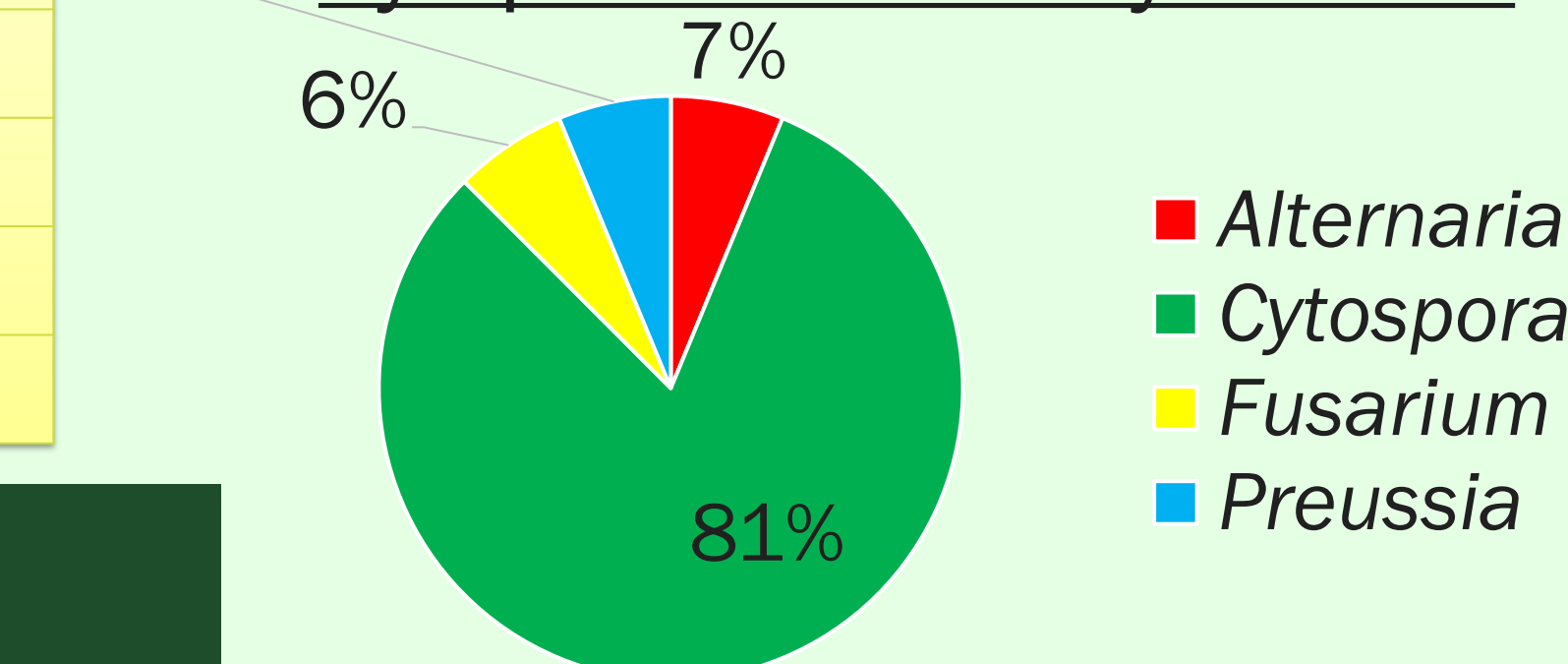
Genus of Organisms Found on Symptomatic Apple Tissues



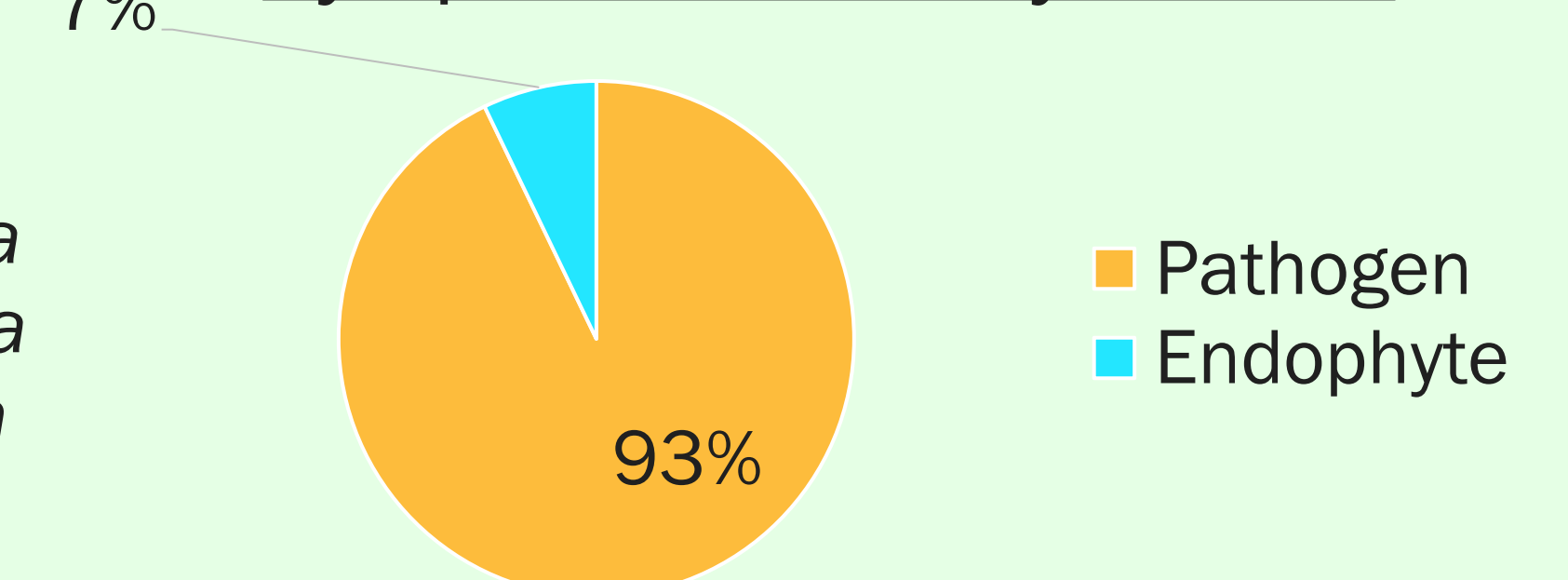
Life Style of organisms found on Symptomatic Apple Tissues



Genus of Organisms Found on Symptomatic Cherry Tissues



Life Style of organisms found on Symptomatic Cherry Tissues



NEXT STEPS

- Assist the Stewart lab with future field trails to determine management strategies and epidemiology of *Cytospora*.
- Establish communication between growers so they can work together in their pest management goals.
- Provide resources and information for growers.



Figure 1. Flagging in peach tree caused by Cytospora canker



Figure 2. Cytospora canker on peach tree

EDUCATIONAL APPLICATION

This internship introduced me to a broad range of skills that will be applicable throughout my career. I learned valuable laboratory skills including fungal isolations from host tissue, DNA extraction, PCR techniques, and sequencing of fungal isolates. I also scratched the surface in gaining knowledge of fungal biology.