

# Situation

There is a lack of formal education on the practice of open and reproducible research in the agricultural sciences

## Assumptions

There is currently a growing interest in reproducible research within plant pathology.

Open Science practices can have widespread benefits to the agricultural sciences community including verifiable results, stakeholder trust, and educational resources.

### Inputs

Open Data Sets  
Open Source Software  
Laptop Computers  
Institutional Web Access  
Students  
Course website hosted on GitHub  
Open Science Framework  
Expertise in Reproducible Research

### Activities

#### What We Do:

- Design inquiry-based course for open and reproducible research using an active learning model
- Create example of fully reproducible and open research assessing local adaptation in the genome of the pathogenic fungus *Sclerotinia sclerotiorum*

#### Who We Reach:

Graduate students in the agricultural sciences

### Outputs

Future scientists trained in reproducible techniques  
Resources for teaching open and reproducible research in agricultural sciences  
Concrete examples of reproducible research  
Well-annotated data available for further analysis

## External Factors

Because much of the course materials will be developed using open data and tools, the following factors will affect the outcome and execution of the course:

The site for hosting and developing materials remain freely available for open source projects.

Interest and willingness of Graduate Students to participate

## Outcomes

### Knowledge

Graduate students who participate in the course will be able to understand the benefits, mechanisms, and tools for reproducible research.

They will additionally know how to communicate their research to diverse audiences.

### Actions

The students will bring the tools for effective reproducible research to their own work and the tools for effective communication to their future presentations and publications.

### Conditions

Broader impacts of the course will be:

Graduate students with a broader and more transferable skill set

Improved rigor in analysis of agricultural data

Increase stakeholder trust