

Exploring Relationships Between Pollinators and Canola



RACHEL OLSSON AND DAVID CROWDER
DEPT. OF ENTOMOLOGY, WSU

Background: The eastern Washington and northern Idaho region has an ideal climate for growing canola. Canola sees a 30% increase in yield when insect pollinated compared with wind pollination alone. The long flowering period for canola coincides with bee nest initiation in the early spring and can provide floral resources for bees throughout a majority of the bee foraging season. We aim to explore the relationship between the physical properties of canola flowers and pollinators native to our region. We hope to offer management strategies to increase canola yield and improve food resources for wild bees in the inland northwest.

Research goals: We are interested in exploring the environmental impact on the nutritional resource availability of canola as a food for bee colonies through two approaches. First, we are examining how environmental conditions such as canola variety, presence of insect herbivores, plant pathogens, and water stress affect the plant traits that are attractive to bees. We will measure nectar sugar concentration, protein makeup of pollen, flower abundance, and flower petal size. These measurements will take place both in the field and in the greenhouse. Second, we will survey the bee species present in the inland northwest and experimentally monitor how variation in diet affects bees' ability to provide pollination services to canola, and how those services affect canola yield.

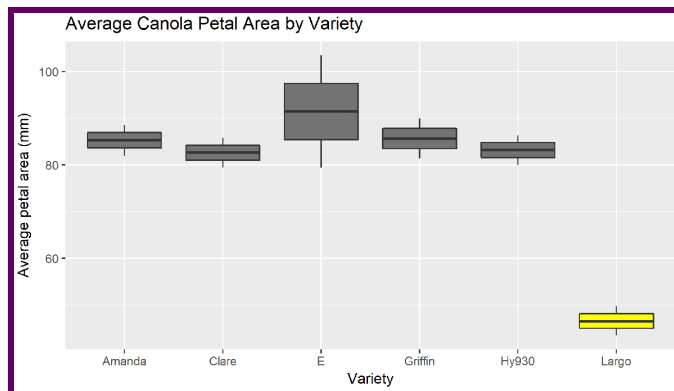


Figure 1. Canola petal size by variety.

Results to date: In 2017, we collected canola flowers at six different farms and research plots in eastern Washington and northern Idaho. We found that the variety Largo had significantly smaller petals than the other varieties sampled (Fig. 1).

We also found the wheat fungal pathogen *rhizoctonia solanum* present in the fields. This fungus can colonize canola, so we ran an experiment in our greenhouses to test whether the presence of the pathogen in the soil would have similar effects on canola. We found that the presence of the pathogen did not affect the development time of the plants. However, we found that plants grown in soil with *rhizoctonia* had larger flowers (Fig. 2), and more flowers (Fig. 3) than plants that were not exposed to *rhizoctonia*.

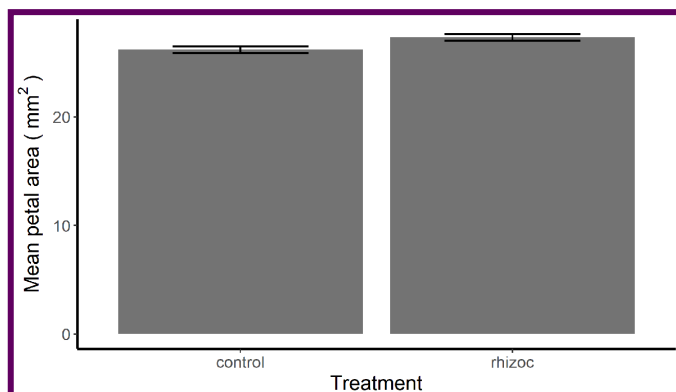


Figure 2. Canola exposed to *rhizoctonia* had larger flowers.

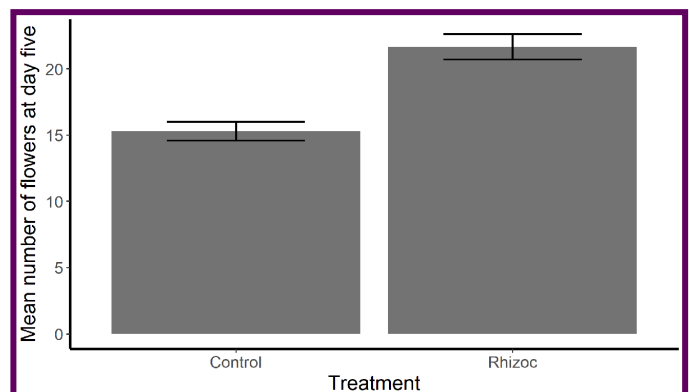


Figure 3. Canola exposed to *rhizoctonia* had more flowers per plant.