IMPACTS OF MAMMALIAN GRAZING ON PLANT FITNESS AND INSECT COMMUNITIES

By: Kellie Keener

Jacob Herschberger, a senior biology major with a concentration in environmental science, is running an experiment to determine how grazing behaviors affect plant and insect communities.

The experiment was inspired by one of his classes.

"I took a plant-insect interaction class in the spring [2018] so this idea kind of spurred from that."

-Herschberger.

After coming up with an idea, the next step was to find a faculty advisor. Herschberger originally spoke with Dr. Boal, but since she was retiring she directed him to Dr. Stieha. Stieha is an ecologist who has published multiple papers on plant-insect interaction.

The first experiment would compare two orchard grass varieties, Athos and Olathe (*Dactylis glomerata*). Herschberger chose this type of grass because they are both the same species of orchard grass, but just different varieties. Athos is a grazing variety grass and Olathe is a hay variety grass.

Herschberger hypothesized that the Athos would experience a higher rate of compensatory regrowth than the Olathe when exposed to greater grazing pressure due to Athos' genetic makeup as a grazing variety of grass.

Compensatory regrowth is when the plant grows back to its original state after being grazed upon. "[The] herbivore attacks the plant, eats the plant, it tries to regrow back to its current state." explains Herschberger.

To simulate grazing in a controlable setting, Herschberger and Stieha planned to cut the grasses at set times.

"When I proposed the idea it was like, we had field plots… and we were gonna survey for the insect community, see how the insect community is affected by cutting frequency regimes… but all that came up was Foxtail [(Setaria sp.)]." says Herschberger.

Foxtail is common in areas with lots of human disturbance.

While the field plots did not work, Stieha planted some of the grasses in the university greenhouse near the Roddy building.

In May 2018, 18 "blocks" were set up in the greenhouse for experimentation. Each block held six pots containing both species of grass and all three treatments.

The treatments were the different cutting frequencies. One frequency was to cut the plants (at a height of 10cm) once a month, another frequency was to cut the plant (at a height of 10cm) every other month, and one treatment was to only cut the plant (at a height of 10cm) at the conclusion of the experiment.

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ORCHARD GRASS

Herschberger hoped to have the experiment finished by the end of the fall 2018 semester.

Because the field plots did not work out, Herschberger devised