

**AGRICULTURAL RESEARCH FOUNDATION  
INTERIM REPORT  
FUNDING CYCLE 2016 – 2018**

**TITLE:** “Effect of Clipping Heights on Yield and Quality of Simulated Management Intensive Grazing of Irrigated Pasture”

**RESEARCH LEADER:** Scott J. Duggan & Mylen Bohle

**COOPERATORS:** Central Oregon Ag Research Center (COARC) – Director, Carol Tollefson

**SUMMARY:** The three county area of Central Oregon has a network of canals delivering irrigation water to farms in Deschutes, Crook, & Jefferson counties. Farms in Central Oregon grow a variety of crops including pasture for livestock grazing and hay production. The total number of irrigated acres dedicated to pasture in a given year is approximately 46,600 acres. Unfortunately, a majority of livestock owners over graze their pastures resulting in less forage per acre, reduced profits, increased weed pressure and increased water use. Results from this trial should help OSU Extension educate Central Oregon landowners about forage production and how over grazing harms the plant and reduces yield. Furthermore, it is hoped that our research will potentially reach Eastern Oregon producers with approximately 267,000 acres of irrigated pastures.

Proper grazing height (or clipping height on hay fields) of pastures will increase the longevity and dry matter (DM) production of pastures, especially grazing sensitive grasses like orchard grass. It is hypothesized that leaving taller grazing residual will increase DM production and thus increase the pounds of livestock weight produced. An indirect benefit could be less ingestion of parasites by livestock by keeping grazing heights taller. Taller grazing heights should allow less weeds to take hold and soil temperatures should be cooler, reducing water and heat stress to the plant, and stand life should increase. Numbers whether positive or negative correlated to the hypothesis will allow the livestock industry to have documented scientific information in order to make informed decisions on grazing height and pasture management.

**OBJECTIVES:**

1. To conduct research that will determine the optimal grazing height of orchard grass raised for livestock production and hay in Central Oregon.
2. Document the response of plant regrowth through multiple clippings/harvest during a growing season with different treatments of scheduled clipping intervals and height.
3. Educate landowners throughout Oregon on optimal grazing height of orchard grass in order to maximize production of this important livestock forage.

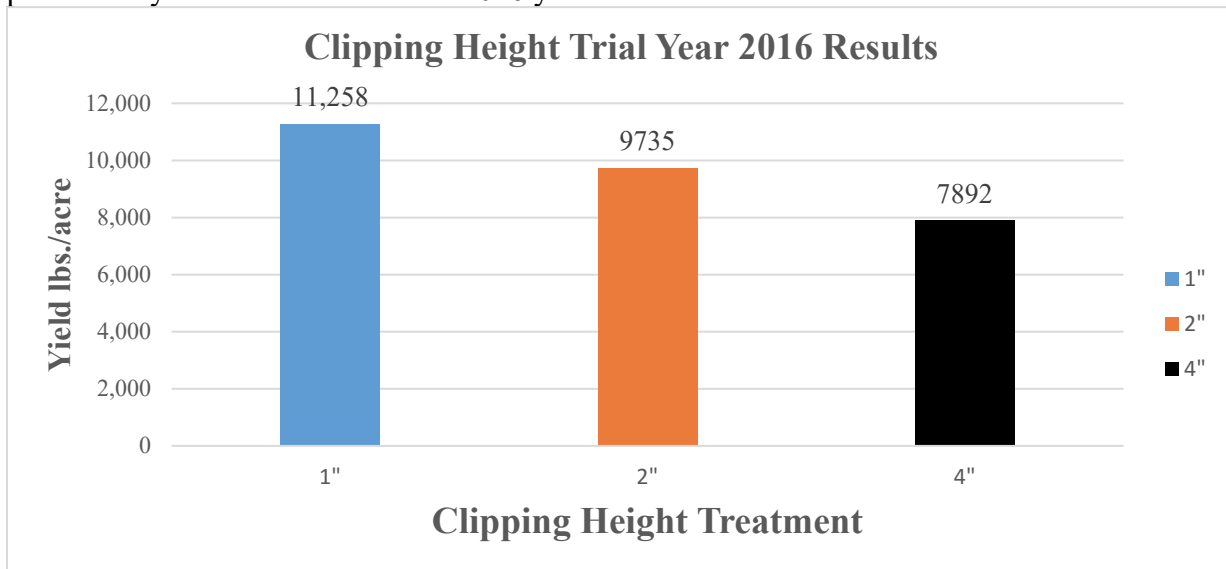
**PROCEDURES:**

1. Secured research site at COARC and staked out twelve, 6’x20’ plots.
2. Soil test samples were pulled from the twelve combined plots and sent to a lab.
3. Height of clipping plot treatments are 1”, 2”, and 4”.
4. COARC farm manager Hoyt Downing irrigated research trial plot on an as needed basis.

5. The date and average height of orchard grass in plots prior to clipping was recorded with a forage grazing stick.
6. Pictures of the research area were taken and recorded prior to and after clipping.
7. Harvest dates occurred on April 20<sup>th</sup>, May 18<sup>th</sup>, June 23<sup>rd</sup>, July 20<sup>th</sup>, August 24<sup>th</sup>, September 27<sup>th</sup> and November 4, 2016.
8. A forage plot harvester was utilized to clip grass plots at the appropriate 1", 2", and 4" height.
9. Orchard grass was raked on to canvas tarps, weighed and measured in order to determine yield for each treatment plot.
10. Samples were collected and sent to Klamath Basin Research & Extension Center (KBREC) lab. Grass was tested for quality and amount of carbohydrates in forage with Near-Infrared Spectroscopy (NIRS).
11. Plot was fertilized after each harvest with organic chicken feather meal.
12. We are utilizing forage lab tests to calculate yield response, quality of forage and stand persistence.

**SIGNIFICANT ACCOMPLISHMENTS TO DATE:**

Mylen and I expected the research plot with the 1" clipping height treatment to generate more pounds per acre of grass in the spring and summer than the 2" or 4" clipping height treatment plots. However, by the end of the summer, we expected the 1" clipping height treatment plot to yield less and the 4" treatment to begin producing more pounds per acre due to the carbohydrate reserves in the crown of the 1" cutting treatment plants being depleted. Surprisingly, by the end of the summer the pounds of forage produced per acre on the 1" treatment plots was still out producing the 4" treatment plots. In the first cutting, the 1" treatment produced 1,753 pounds more forage than the 4" treatment for a 63% difference. In the second through sixth harvests the 1" treatment out produced the 4" ranging from 10%-25%. The last harvest on November 4<sup>th</sup> did not document a reduction in the yield of the 1" treatment compared to the 4" plot as expected. Instead, a whopping 68% difference was recorded with the 1" treatment plot producing 169 pounds more forage per acre than the 4" treatment plot. Below is a chart showing total forage produced by each treatment for the 2016 year.



This is not the results that we expected. We are searching for a logical reason that will explain why the 1” treatment produced the most forage even in the fall months when its’ energy reserves were being depleted due to close cropping. The data indicates that even though we cut into the crown of the plant leaving only 1” of plant above ground, it did not slow the plant’s growth. Our best guess is that next year a decline in productivity for the 1” clipping height plot will be seen and the 4” plot will produce the most forage. It will be interesting to see next year’s data, which should provide more insight and allow us to explain these unexpected results.

In addition to our research trial, Mylen and I did six pasture walks/classes this year in order to educate farmers and improve pasture forage production in Central Oregon. This is four more classes taught than in 2015. These walks enabled us to teach and drive home the “sins” of overgrazing to our clients. In addition, we hosted the Central Oregon Forage Field day at COARC on May 10, 2017. The orchard grass research plot was the focal point for discussion. We did a presentation that focused on the damage over grazing does to orchard grass plants. The reason for conducting the trial and the methods utilized in conducting the trial were discussed and how our research results would hopefully yield valuable information to livestock producers and hay farmers in Central Oregon.

**ADDITIONAL FUNDING RECEIVED DURING PROJECT TERM:** COARC did not charge us for the 2016 year in order to help us out in my first year of research. However, COARC will charge us for production costs in 2017. I hope that we can get three years of data results with the two-year grant funds awarded to us.

**FUTURE FUNDING POSSIBILITIES:** Perhaps a seed company might become a part of future research.