

Tall Fescue Grass Growth Rates and a Connection to Pasture Grazing

12 Grade

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Abstract

Summers are hard on Colorado pastures and grazing, tall fescue grass is in the mix as well. This project was done to find out when rotation is necessary and what the growth rates are if a pasture is grazed once a week and every week. The hypothesis was that if grass is grazed once a week then the total growth and dry matter will be greater than grass grazed every two weeks or grass left undisturbed. This project had three tested pots of tall fescue grass. The grass was planted in damp soil and placed in a germination chamber for two days until; the seeds began to sprout. The pots were then moved in to a greenhouse and watered every day. As soon as there was over 13.5 cm of grass, the pots were labeled. One was control, one was clip once a week and one was clip twice a week. Then every week the grass was measured and the once a week pot was clipped, and the clip twice a week pot was clipped every other week, the control was not clipped. The hypothesis was rejected because the control had more dry matter and growth than the once a week grass clipping.

Introduction

Throughout the summer many pastures in Colorado have dried up due to the drought but does frequency grazing have an effect too? How does tall fescue grass grow in heavy grazing conditions? Heavy grazing in general is never beneficial to dry weak grass. This is a closely studied area because “grasses are the dominant plants in most forage-based enterprises throughout the world” (Trlica, 2013).

Hypothesis: If grass is grazed once a week then the total growth and dry matter will be greater than grass grazed every two weeks or grass left undisturbed.

Review of Literature

Tall fescue grass is a common grass in pastures throughout Colorado. This grass is a long-lived perennial, cool-season, deep-rooted, bunchgrass and it also is well adapted to humid or temperate areas (Hannaway, 2004). Tall fescue grass can produce large amount of nutritious leaf growth in the spring months, but livestock can affect the growth during the growing season due to heavy grazing. Tall fescue is a common grass and all livestock can forage on it except it can be toxic to pregnant mares.

Pasture management is the best way to keep having healthy constant growing pastures throughout the summer, however it is best to have flexible grazing management for drought or wet time periods. When looking at your pasture and debating on moving pastures look at the grass and its condition and never on a predetermined date. Grasses are better producers of nutritious leaf growth during the

spring months but letting “livestock graze during the growing season can affect the regrowth” (Trlica, 2013).

This hearty grass is a bunch grass that is known for growing in clumps with deep root systems that keep it anchored down in the soil. The roots are strong and long and do not do a lot of intertwining so that there is more access to water when in a drought. The “root growth usually is affected by heavy defoliation, which makes the plant less competitive and more vulnerable to drought, because the roots may not penetrate to depths where adequate moisture exists” (Trlica, 2013).

Materials

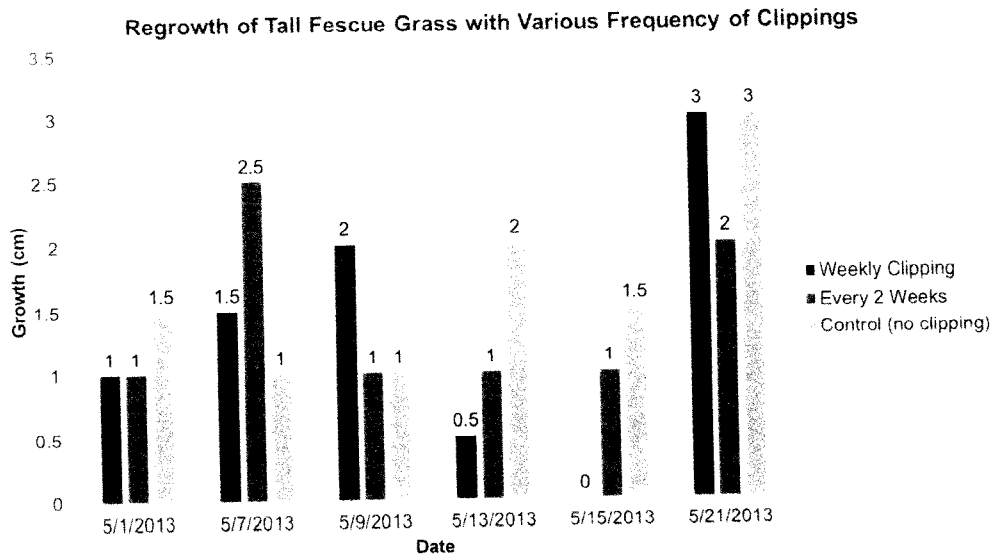
- Three planting pot with a 6 inch circumference
- Damp potting soil
- Tall fescue seed
- Germination chamber
- Scissors
- Pencil
- Paper
- Ruler
- Well light area
- Chicken wire

Methods

- Fill all three pot with damp potting soil until there is two inches left from the top.
- Sprinkle 1/8th of a cup of tall fescue grass evenly on top of the damp soil, in all three pots.
- Label the pots control, cut every week and cut every two weeks.
- Set all three pot in the germination chamber for two days just so the grass starts to sprout.

- After they have all sprouted place in a well light area and water every day.
- Once grass starts to become thicker and taller place chicken wire around the pots to help the grass grow upward.
- Begin to measure all pots every other day.
- Cut the every week pot on a specific chosen day and clip on that day every week and do the same with the every two week pot as well.
- **DO NOT EVER CLIP THE CONTROL ONLY MEASURE.**
- Record the growth height as well as how much was taken off, and record the condition of the grass every time.
- After the final measurement, clip all grass growth and dry.
- Weigh all dried grass clippings in grams. Record the data.
- Save clippings and dispose of pots and soil properly.

Results



Regrowth of Tall Fescue Grass with Various Frequency of Clippings			
	Growth (cm)		
	Weekly Clipping	Every 2 Weeks	Control (no clipping)
Total Growth	8	8.5	10

Dry Matter Regrowth of Tall Fescue Grass with Various Frequency of Clippings			
	Dry Matter (g)		
	Weekly Clipping	Every 2 Weeks	Control (no clipping)
Total Dry Matter	29.7	30.7	31.9

Discussion and Conclusion

In growing tall fescue grass to find the effect of grazing frequency on growth rates it was interesting to see how pastures can be affected. It shows the need to keep a well maintained pasture management schedule. The hypothesis was rejected because the control had more dry matter and growth than the once a week grass clipping. One problem that may have accrued was that the watering may not have been as consistent as it should have been, due to the fact that the grass was put in to the Ag departments green house that in ran by many Ag students. This did not skew the results too badly though it could have had an overall major effect. Throughout growing and experimenting with tall fescue grass, it was surprising to see the growth rates change based on how often the grass was clipped. This project was helpful to learn about pasture management and to find out how pastures could be affected by grazing too much. This experiment can help ranchers and farmers understand growth rate of grass when grazed frequently.

Reference List

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Penn State Extension. (2013). Retrieved May 15, 2013, from Pastures: Grazing Management website: <http://extension.psu.edu/agronomy-guide/cm/sec8/sec810>

Trlica, M.J. (2013, March). Grass Growing and Response to Grazing. Retrieved May 21, 2013, from Grass Growth and Response to Grazing website: <http://www.ext.colostate.edu/pubs/natres/06108.html>

Acknowledgements

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ASK Questions:

- What grasses sustain heavy grazing better?
- How often should you rotate your animals through pastures to allow the proper growth of grasses?

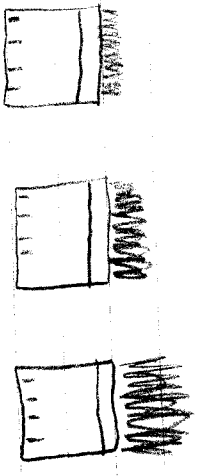
Observation:

- Watch and figure the growth and management of pastures (trial error grass)
- After turning horses out on pasture, I have noticed that the grass rates are in amongst season are not the best

Primary Research Questions

- How often should you rotate livestock through pastures to allow for exceptional growth rates?

Sketches



Non-Directional Hypothesis:

- Degradation in pastures will differ with different grazing frequencies,

Entity:

- Tall Fescue Grass

Independent Variable:

- Frequency of Clipping
- When I cut the tall fescue grass weather it is every week or twice a week.

Dependent Variable

- Regrowth of Clipping
- The height/length of that the grass is cut at.

Background Research Question

Background Research Questions

Form at least one question for each area below.

Entity: How will tall fescue grass grow and reclaim the pasture after being overgrazed and in a drought season?

Independent Variable: How will clipping tall fescue grass once a week to twice a week effect the growth rate/reclaim rate?

Dependent Variable: How will clipping tall fescue grass at all different lengths effect the regrowth/reclaim rate?

Relationship between Entity and Variables: How will tall fescue grass grow after being clipped to a specific length?

- How does pasture rotation/frequency affect regrowth?

If then Hypothesis:

Materials:

- Three potting pots
- Wet soil
- Tall secure seed
- Germination chamber
- Scissors
- Data table

Procedures:

- Fill all three pots with wet soil
fill them to about four inches left
from the top.
- Sprinkle $\frac{1}{8}$ " of a cup of tall fescue
grass seed on top of the soil. In
all three pots.
- Set all three pots in Germination
Chamber for two days or at least until
seeds begin to sprout.
- Label pot Control, every week, every two
weeks.
- One all pots were sprayed place in the
greenhouse with All-Sen were around
them so the grass grows straight up.
- Leave the Control pot alone just measure
it every week.
- Measure and cut the grass in the every
week pot.

- measure the grass in the every two weeks
pot, every week but do not cut.

Notes on Experiment setup:

- All wheat well, throughout project.
- to start the growth stage I placed the grass in the germination chamber and as the grass grew I placed the wheat in the chamber to keep the grass grow straight.

List of Area Observation:

Sketch of Data table:

Day one: 4.25.13
pot 1: 14cm
pot 2: 16cm
pot 3: 15cm
Cut all down to 13.5cm

Components of a Table:

- Meaningful Table Title
- Row Titles
- Column Table
- Units

Components of a Graph:

- Meaningful Graph Title
- Category Labels on the Horizontal Axis
- Legend
- Vertical Axis Label
- Horizontal Axis Label
- Data Labels

Daily Journal: 4.5.13

To day was the first Day of testing

pot 1 (control) 15cm

pot 2 (cut every two weeks) 14.5cm

pot 3 (cut every week) 14.5cm

pot 3 was cut down to 13.5cm

- I cut 1cm off

I also put a little chicken wire around my pots so that the grass would grow straight up and not off to one side.

Daily Journal 5.7.13

Second day of clipping pot 3
First day of clipping pot 2.

pot 1 (control) 16cm

pot 2 (two weeks) 17cm

pot 3 (every week) 15cm

pot 2 + pot 3 were cut to 13.5cm

- cut 2.5cm off of pot 2

- cut 1.5cm off of pot 3

Daily Journal 5.9.13

- To day I just measure the grass.

pot 1 (control) 17cm

pot 2 (clip every two weeks) 14cm

pot 3 (clip every week) 15.5cm

Daily Journal 5.13.13

- measured and clipped grass

pot 1 (control) 19cm

pot 2 (clipped every two weeks) 15cm

pot 3 (clip every week) 14cm

pot 2 + 3 cut down to 13.5cm

- clip 1.5cm off of pot 2

- clip off of pot 3

on pot 3 the grass was really uneven

Daily Journal 5.15.13

measured plants

pot 1 19.5cm very shaggy
pot 2 14.5cm tips are slightly burnt
pot 3 13.5cm

Daily Journal 5.21.13

measured + clipped

pot 1 control main height was 19cm but some were 9'
35cm
Tide +
DRAIN
lighter green
pot 3 with 16.5cm very uneven some at 21cm
pot 2 with 15.5cm some blades at 22cm some at 18cm

pot 2 & 3 cut down to 13.5cm
pot 2 lost 3cm

Daily Journal 5.23.13

Every week mass 4.6 g
 20.9 g

Every two week mass 7.0 g

Over all Dried mass for every week
clippings was 29.19 g .

twice a week 30.9 g .

Control had an over all dry mass of 31.9

Daily Journal