Weed Control and Pasture Management Trials

Mark Landefeld, Ohio State University Extension Educator, Monroe County
Chris Penrose, Ohio State University Extension Educator, Morgan County
Jeff McCutcheon, Ohio State University, Southeast Region Director

Objective

Many acres of pasture land are used for grazing livestock in Ohio. Weed growth in these pastures may reduce quality of the forage, quantity of useable forage or cause livestock mortality if poisonous weeds are present and consumed. The purpose of this trial was to determine if weed populations in pastured forages could be changed or reduced by varying the timing of mowing throughout the late spring and summer growing period without the use of herbicides.

Background

Crop Year: 2016
Location: Eastern Agriculture Research Station
Belle Valley, OH
County: Noble
Soil Type: Vandalia-Guernsey silty clay loams (VcC2)
Drainage: Natural
Previous Crop: Established Tall Fescue & Mixed Grasses
Tillage: None
Soil Test: pH 7.3 P 243 ppm; K 401 ppm
Ca 3037 ppm; Mg 456 ppm;
and CEC 19.8 meq/100 gram
Planting Date: N/A, Established Pasture
Seeding Rate: N/A
Harvest Date: Multiple Dates 2016

Methods

A randomized complete block design was used with eight (8) treatments (including a control) and four (4) replications of each treatment. Each plot was fifteen feet wide by twenty feet long with an additional one-foot border along each side to allow mechanical mowing equipment to be able to pass between marker posts. The site is a predominately tall fescue and mixed grass pasture field and the soil test (Mehlich III) results, listed above, were taken in 2015 at the beginning of the multi-year experiment. Forage samples were taken near the beginning of June, July, August and September each year. Each plot was rated for the amount of broadleaf weed pressure contained at the time of sampling. A scale of 0-9 was used (where 0 = no visible weeds, to 9 = 90% weed occupation of the stand). One additional rating was taken at the beginning of October before the end of the growing season. Forage samples two feet by two feet ($4ft^2$) were hand harvested from each plot and broadleaf weed species were recorded. Total fresh weight of each sample was recorded, weed(s) removed if present and weighed, and the weed-free sample weight was recorded. From each of the 32 weed-free samples a sub-sample was removed to calculate dry matter. All samples were placed in the forage dryer at 46 degrees Celsius and remained there until dry. All dry weights were recorded and calculations were subsequently made from each sample to determine dry matter per acre. Each month, after harvesting samples,

cow/calf pairs grazed the paddock, where the plots were laid out, until the desired amount of residual forage remained. Cattle were then removed until the next month. After each grazing, treatment plots were cut with a rotary mower according to the plan design, making one pass over the plot and cutting to a height of approximately four inches above the soil surface.

Treatments consisted of: (1) Control (no mowing), (2) June only mowing, (3) July only mowing, (4) August only mowing, (5) September only mowing, (6) June and August mowing, (7) July and September mowing, and (8) mown each month; June-July-August-September.

Results

The study showed variation between plots when looking at the existing forage late in the growing season. Physical size of some weeds was noticeable since they had not been mowed. Canada thistle (*Cirsium arvense*) and cocklebur (*Xanthium strumarium*) were the most visible species in the plots. However, there were a variety of other weeds such as burdock (*Arctium minus),* dandelion (*Taraxacum officinale),* horsenettle (*Solanum carolinense),* ironweed (*Vernonia gigantea),* broadleaf plantain (*Plantago major)* and smartweed (*Polygonum amphibium).* While each growing season is different, rainfall amounts are listed in table 1 for reference.

Table 1. Rainfall measured in inches during the primary growing season.

Year	May	June	July	August	Sept	5 Month Total
2016	4.72	3.63	4.63	4.78	3.37	21.13

Table 2. Mean observed weed rating present during 2016.

Rating period	Month Mowed							
	None	June	July	Aug	Sept	June, Aug	July, Sept	Each month
June [1]	2.5 [a,b]	3.3 [a]	2.3 [a,b]	2.8 [a,b]	2.0 [a,b]	1.8 [a,b]	1.8 [a,b]	1.3 [b]
July	4.3 [a]	4.0 [a,b]	3.0 [a,b]	2.5 [b]	3.3 [a,b]	2.5 [b]	2.5 [b]	3.0 [a,b]
Aug	4.5 [a]	3.8 [a,b]	2.8 [b]	3.8 [a,b]	2.8 [b]	2.8 [b]	3.0 [a,b]	3.3 [a,b]
Sept	6.8 [a]	5.8 [a,c]	4.0 [b,c]	3.0 [b,c]	4.3 [c]	2.0 [b]	4.5 [c]	2.5 [b]
Oct	6.8 [a]	3.8	3.8	3.8	2.8	2.3	3.3	2.8
Overall [2]	**5.0 [a]**	**4.1 [a,b]**	**3.2 [b,c]**	**3.2 [b,c]**	**3.0 [b,c]**	**2.3 [c]**	**3.0 [b,c]**	**2.6 [c]**

[1] LSD = 1.64 ($P<0.05$)
[a,b,c] Different superscripts denote significant differences ($P<0.05$)
[2] LSD = 1.249 ($P<0.05$)

Summary

Perennial, biennial and annual broadleaf weeds can affect livestock production. This trial is an educational experiment to help landowners determine the best time, or times, to mow pastures if trying to reduce broadleaf weed pressure. Early results indicate weed populations can be significantly reduced when mowing is targeted at specific times of the growing season.

For farm operators who only plan to mow one time a year, preliminary data suggests July, August or September may be the best option. However, it is not significantly different than other single cut months. If farm managers plan to mow pastures more than one time per year, preliminary data suggests the June/August mow dates may be best, but it is not significantly different from other mowing frequencies except the June only cutting.

If one can reduce weed pressure by mowing at the appropriate time, the need for herbicide applications may be reduced or eliminated. Also, if mowing multiple times a year, legume plants may thrive better and become a higher percentage of the sward. These factors could have a positive effect on forage quality in the plots for the future. This trial will continue to determine if there will be significant differences in weed populations, and in the yield of grasses and legumes based on the timing of the mowing.

Acknowledgement

The authors would like to thank the Eastern Agricultural Research Station employees for their assistance in this project.

THE OHIO STATE UNIVERSITY

For more information, contact:
Mark Landefeld
OSU Extension –Monroe County
101 N. Main St. Rm. 17
Woodsfield, OH 43793
landefeld.@osu.edu