Weed Control in Pasture Management with Timed Mowing

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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:	2017	Tillage:	None
Location:	Eastern Agriculture Research Station Belle Valley, OH	Soil Test:	pH 7.3 P 243 ppm; K 401 ppm; Ca 3037 ppm; Mg 456 ppm; CEC 19.8 meq/100 gram
County:	Noble		
Soil Type:	Vandalia-Guernsey silty clay loams (VcC2)	Planting Date:	N/A, Established Pasture
Drainage:	Natural	Seeding Rate:	N/A
Previous Crop:	Established Tall Fescue & Mixed Grasses	Harvest Date:	Multiple Dates 2017

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. No additional fertilizer was added to any plots. 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 for

future comparison of changes in composition of the sward. Each month, after harvesting samples, cow/calf pairs grazed the paddock, where the plots were laid out, until the farm manager determined the cattle should be moved. 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 among mowing treatments 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.

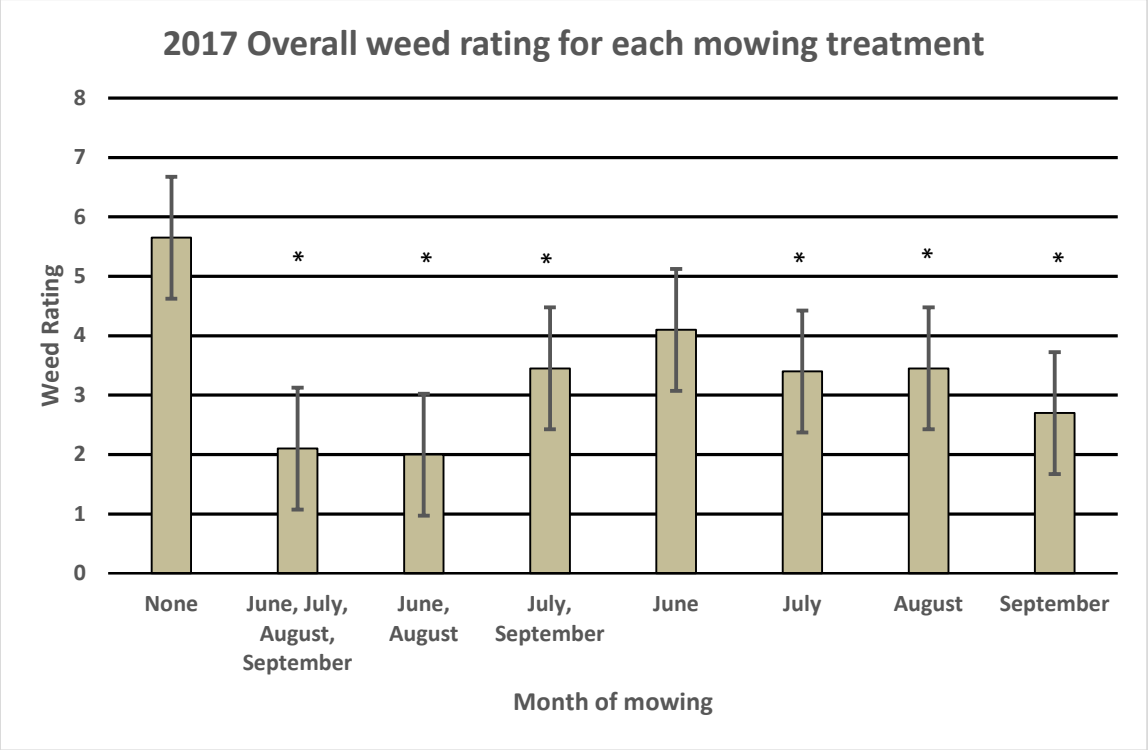
Year	May	June	July	August	Sept.	5 Month Total
2017	3.67	6.68	5.46	3.32	1.08	20.21

Table 2. Mean observed weed rating present during 2017.

	Month Mowed							
Rating period	None	June	July	Aug	Sept	June, Aug	July, Sept	Each month
5 Month Overall Rating	5.65	4.1	3.4	3.45	2.7	2.0	3.45	2.1

LSD = 2.0 ($P<0.05$)

Figure 1. Overall weed rating for each mowing treatment



*Denotes significantly different from control (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. Data included for this report is from the 2017 study. Results indicate all of the mowing treatments had significantly less weeds present (P<0.05) than the control except for the June only treatment. The two mowing treatments of June/August and the four mowing treatments of June/July/August/September, were significantly less (P<0.05) than both the non-mowing treatments and the June only treatment. This study suggested that the June/August mowing was the best option to reduce weeds.

For farm operators who only plan to mow one time a year, this data suggested July, August or September may be the best option. If farm managers plan to mow pastures more than one time per year, preliminary data suggested the June/August mow dates may be best.
Reducing weed pressure by mowing at the appropriate time reduces the need for herbicide applications so that herbicide use 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.

Results indicate weed populations can be significantly reduced when mowing is targeted at specific times of the growing season. For future study, educators plan to quantify weed dry matter weight along with visual ratings for additional comparisons.

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