



Forage Management

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October 1992

Principles of Grazing Management

When managing a pasture, a producer needs to consider both the plant and the animal. If the pasture is grazed too hard both plant and animal production will be reduced. If the grazing pressure is too light forage use will be low, forage quality may decrease, and animal production per acre will be low.

The effect of grazing on forage and livestock production depends on its timing and intensity. Timing of grazing refers to the rest interval allowed the plant between grazings. Intensity of grazing is how much forage stubble or leaf area is left on the plant at the end of grazing.

Let's review what happens in a plant as it regrows after a harvest. After the leaves are removed from a plant, new leaf growth starts by using energy reserves (sugars and starches) stored in roots and lower stems. As new leaves expand and intercept light, photosynthesis (sunlight-powered conversion of carbon dioxide and water to oxygen and simple sugars) begins to produce more energy for growth and to replenish the reserves used to start the growth cycle.

Timing of grazing should allow the plant to restore its energy reserves. If not given enough time before losing its leaves again, the plant will be weakened, production will be lowered, rooting depth will be reduced, and in some cases the plant will die. The time required to restore these energy reserves depends on the plant species, the intensity of defoliation, temperature, soil fertility, and soil moisture.

Intensity of grazing also affects plant regrowth. If all leaves are removed from the plant at the time of grazing, it must rely entirely on root and

stem reserves for regrowth. In some grasses where reserves are stored in the lower leaf stem, close grazing will physically remove energy reserves and slow regrowth. On the other hand, in some plants the lower leaves at the base are older and inefficient in photosynthetic activity. If these leaves are removed through close grazing, new more efficient leaves are allowed to grow.

With some forage species low stubble or root reserves are maintained and leaves must be left to provide the energy for regrowth. This is the case with sudangrass and birdsfoot trefoil. Since their energy reserves are carried higher up in the stubble, warm-season grasses such as switchgrass and big bluestem need more residual stubble left after grazing than the cool-season grasses.

At times it is desirable to use grazing timing and intensity as a tool to set back forage growth. This can be used to increase the white clover content in a pasture or to weaken a sod for no-till seedings. When a pasture is grazed to a short stubble height, the grasses are weakened and the clover leaves are allowed more time to get above the grasses for sunlight. If ladino clover-orchardgrass stands are not grazed to a 2-inch stubble occasionally, the clover will be lost. In bluegrass-white clover stands a 1-inch residue helps maintain the clover. To get the clover response, this management must be accomplished when the soil fertility, moisture, and temperature are suitable for clover growth.

To improve forage production and use pastures should be grazed to the desired stubble height in seven days or less. Otherwise the animals will graze the regrowth and weaken the plants. Where animals graze a pasture for more than 10 to 14 days, they

selectively graze the forage regrowth and it is more difficult to get them to clean up the more mature forage. For maximum pasture production and utilization, grazing stays should be limited to three days or less. On a practical basis 7-day stay usually reduces grazing of regrowth to a level where selective grazing is not readily noticed.

Grazing timing and intensity affect the animal by determining the amount and quality of pasturage available. When an animal is placed on a new pasture, it is able to take large mouthfuls of highly nutritious forage and select the more palatable species. This is referred to as “selective grazing.” As grazing continues less forage is available, less feed can be taken in a bite, and the forage digestibility and protein content decrease. To compensate the animal may take more bites per hour or graze a little longer. However, the animal does not compensate very much and total feed intake begins to drop. As forage use increases, forage intake per head decreases and animal production per head decreases.

However, as forage use increases animal production per acre increases. This is because less forage is wasted. The increased gain on the additional animals used to get the higher grazing pressure is greater than the reduced gain per head on the initial animals. Average daily gains per head are nearly constant until about 50% of the pasture is used. However, major decreases in production per head occur as pasture use approaches 80%, resulting in reduced animal production per acre. The optimum level of pasture utilization depends on the animal type, on the forage species, and on the economics affecting the farm. The pasture manager’s job is to determine the best compromise between production per head and production per acre. Controlling the timing and intensity of grazing is the means of implementing this management decision.

Grazing recommendations for rotationally stocked grass-legume mixes and grasses fertilized with nitrogen are given in Table 1. For bluegrass, orchardgrass, and tall fescue, forage height is the best guide. For timothy, broomegrass, alfalfa and trefoil, calendar rest intervals are the best guide for management.

Management over the year has to be flexible.

The rate of forage growth varies over the year. It is fast in the spring and slow during dry or cold periods. On the average 50% of perennial coolseason forage growth occurs from April to June, 33% in July and August; and 16% from September to November. To account for this, more acres are needed for grazing an animal in the summer and fall than in the spring. This can be done by making hay on some fields in the spring and allowing more acres to be grazed later by reducing the number of animals in the herd or by wasting feed and clipping weeds and seed weeds.

In the spring when using rotational grazing cattle should be moved to the next paddock when it is tall enough. Don’t try to get the very last bit of forage in the field. There is merit in using continuously grazing in the spring to help hold back the spring flush. As pasture growth slows use a more intense rotation. Graze paddocks to optimize forage utilization. In the fall make sure you move cattle off paddocks as they reach the desired stubble height and keep them out. This will reduce cattle weight loss in the fall, reduce soil erosion and loss of expensive fertilizer and lime, and ensure good pasture growth the next year. Have an abuse area for feeding cattle in dry periods when pasture is short or for grazing in wet periods when you would not want your best paddocks punched up. Don’t overstock the farm and manage flexibly.

Table 1. Grazing management to balance forage production and use for different forage species and mixes manage under rotational stocking.

Forage species or mix	Start Grazing	Stop Grazing	Rest Interval
Grass legume management			
		inches	
Bluegrass-white clover	4 - 6	0.5-1.0	3-6
Orchardgrass-ladino clover	8-10	2.0-2.5	3-6
Tall Fescue-ladino clover	6 - 8	1.5-2.0	3-6
Timothy-birdsfoot trefoil	10-12	3.0-4.0	3-6
Alfalfa bromegrass	12-18	2.0-4.0	5-6
Nitrogen fertilized grass management			
Bluegrass - nitrogen	4 - 6	1.0-1.5	3-6
Orchardgrass - nitrogen	9-10	3.0-4.0	3-6
Tall Fescue - nitrogen	6 - 8	3.0-4.0	3-6
Timothy - nitrogen	10-12	3.0-4.0	5-6
Bromegrass - nitrogen	10-12	3.0-4.0	5-6