Principles of Grazing Management

Ed Rayburn, Extension Specialist
WYU Extension Service, Agriculture and Natural Resources
August 2014

When managing a pasture both the plant and the animal need to be considered. 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 grazing has on forage and livestock production depends on the timing and intensity of grazing. Timing of grazing refers to the rest interval allowed the plant between grazing events. Intensity of grazing is how much forage stubble or leaf area is left on the plant at the end of the grazing activity.

Let's review what happens in a plant when as it grows after a harvest. After the leaves are removed from a plant it starts new leaf growth by using energy reserves (sugars and starches) stored in its roots (legumes) or lower stems, stolons and rhizomes (grasses and legumes). As new leaves expand and intercept light, photosynthesis (sun light powering the 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 determines plant vigor in early regrowth and competition between plant species in the pasture and forage intake by the livestock. If all leaves are removed from the plant the plant must rely entirely on energy reserves for regrowth. In some grasses where reserves are stored in the lower leaf stem as in orchardgrass, close grazing will physically remove stem energy reserves and slow regrowth. On the other hand in some plants the lower leaves at the base of the plants are older in age and are inefficient in photosynthetic activity. By removing these leaves through close grazing new leaves are allowed to grow which are more efficient.

With some forages species little stubble or root reserves are maintained and leaves must be left to provide the energy for regrowth. This is the case with crops such as sudangrass and native warm-season grasses such as switchgrass and big bluestem. These species need more residual stubble and leaf area left after grazing than the cool-season grasses since their energy reserves are carried higher up in the stubble.

At times it is desirable to use this knowledge of 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 and 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 get above the grasses for sunlight. If ladino clover-orchardgrass stands are not occasionally grazed to a 2-inch residual height the clover may be lost due to competition from the grass for light and moisture. In bluegrass-white clover stands a 1-inch residual height 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.

Pastures should be grazed to the desired height in 7 days or less. Otherwise the animals will graze the regrowth and weaken the plants. When animals graze a pasture for more than 10 to 14 days they start grazing the forage regrowth and seldom clean up the more mature forage. This selective grazing becomes readily apparent between 10 and 14 days of grazing. For maximum plant production grazing stays should be limited to 3 days or less. On a practical bases a 7-day stay usually reduces grazing of regrowth to a level where it is not readily noticed.

Grazing timing and intensity affect the animal by determining the amount and quality of pasturage available. When an animal is first 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 decreases. At first 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 decreases and animal production per head decreases.

As forage use increases animal production per acre increases. This is due to less forage being wasted. Average daily gains per head are nearly constant until about 50% of the pasture is used. Major decreases in production per head occur as residual pasture mass drops below 1200 lbs. of dry matter per acre, resulting in reduced animal production per head and per acre. The optimum level of pasture utilization depends on the animal type, on the forage species and on the economics affecting the farm. Table 1 gives some guidelines to achieve the proper balance under most grazing situations using cool season grasses and legumes.

The pasture manager needs 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.

Table 1. Grazing management guidelines to balance forage production and use for different forage species and mixes. In general smooth bromegrass and reed canarygrass stands and mixtures should be managed similar to timothy.

Forage Species or Mix	Height to Start Grazing, Inches	Height to Stop Grazing, Inches	Regrowth Interval, Weeks
Bluegrass-white clover	4-6	0.5-1.0	3-6
Orchardgrass-ladino clover	8-10	2.0-3.0	3-6
E_0/E_N Tall Fescue-ladino clover	8-10	2.0-3.0	3-6
E_W Tall Fescue-ladino clover	6-8	1.5-2.0	3-6
Timothy-birdsfoot trefoil	10-12	2.0-3.0	5-6
Alfalfa-smooth bromegrass	12-18	2.0-3.0	5-6
Bluegrass-nitrogen	4-6	1.0-1.5	3-6
Orchardgrass-nitrogen	8-10	3.0-4.0	3-6
E_0/E_N Tall Fescue-nitrogen	8-10	3.0-4.0	3-6
E_w Tall Fescue-nitrogen	6-8	3.0-4.0	3-6
Timothy-nitrogen	10-12	3.0-4.0	5-6

E_W - Wild, toxic endophyte infected tall fescue
E_0 - endophyte free tall fescue
E_N - novel, none toxic endophyte infected tall fescue