



# Cattle Producer's Handbook

Range and Pasture Section

590

## Improved Pastures

Scott Jensen, University of Idaho  
Amy Peters and Gene Pirelli, Oregon State University  
Steve Fransen, Washington State University

Forages are a vital resource in the production of beef cattle. Feed costs typically exceed 50 percent of the total cost of production. Using cattle to harvest (graze) standing forage can significantly reduce feed costs and aid in decreasing the cost of production.

The basis of a successful livestock grazing system is proper management of the forage resource or pasture within the environmental limitations of the area and the knowledge and skill level of the resource manager. Climate, soil characteristics, available water, and plant species all affect pasture production and longevity, however, proper grazing management is the single most important factor affecting forage quality and quantity.

Forage quality and quantity will in turn affect stocking rate, daily gain, reproductive success, and general animal health and vigor. Much of this basic information has been known for more than a century; though it is receiving new attention as modern research and technology assist livestock producers to develop more sustainable grazing systems.

A sustainable and long-lived pasture is dependent upon proper grazing management as well as attention to details, such as appropriate soil fertility, irrigation, and weed management. A continual effort is required by grazing managers to meet the plants' needs in these areas.

### Forage Growth and Management

One of the most basic needs of the pasture plant is the ability to capture solar energy through photosynthesis. This process mainly occurs in the chloroplasts of the leaves, although some chloroplasts occur in the stems. Plants that have had most or the entire stem and leaf material removed, whether through grazing or cutting, have diminished ability to photosynthesize and must rely on energy reserves from the crowns to generate new growth. Consequently, recovery from grazing/cutting is much slower.

Plant vigor and longevity can be reduced if the plants are regrazed before they have sufficiently recovered. If this process is continually repeated, a thinning or loss of the most desirable species occurs, which opens the ground cover for invasion of weeds or less desirable plant species.

The amount of residual (living plant material left after grazing or clipping) also affects the roots of the plant. Research by Johnston (1961) showed that up to 50 percent of the plant's above-ground biomass can be removed with minimal effect on the roots of that plant. Plant biomass removal of greater than 50 percent, however, has a detrimental effect on plant roots. (Table 1). This stoppage of root growth not only affects the plant's ability to recover from grazing, but it can also lead to an increase in bare soil and the invasion of weeds or less desirable plant species.

Growth of cool season pasture plants (both above and below ground) slows considerably during the heat of summer. Plants in non-irrigated areas often go through a period of dormancy during summer. In either case, proper grazing management requires that sufficient residual be left standing to provide the plant with the energy needed to rapidly initiate growth once growing conditions become favorable.

If plants are grazed below appropriate residual or stubble heights, growth that follows a dormancy period

Table 1. Effects of biomass removal.

% plant biomass removed	% root growth stopped
10%	0%
20%	0%
30%	0%
40%	0%
50%	2-4%
60%	50%
70%	78%
80%	100%
90%	100%