



Grazing Management of Bunchgrass Type Forage

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THIS PAPER ON grazing management of seedings with special emphasis on management of established seedings, applies primarily to seedings in the bunchgrass forage area, although the principles of management can be applied to other areas of grass forage.

Generally, seedings made in the bunchgrass forage area simulate the native grass range. Practices applicable to the proper management of bunchgrass areas apply to both native forage and established seedings. These practices can be divided into three groups: (1) Forage management practices, (2) Enabling or facilitating practices, (3) Special forage improvement practices.

Group 3 (*Special forage improvement practices*) consists of such practices as: (a) Brush control, (b) Fertilization, (c) Reseeding, (d) Water spreading, (e) Noxious plant control. These are very important practices that should be given consideration wherever practical. They require especially careful consideration of their applicability in any particular instance. These practices are of the type that show results in a very short time, and therefore they are the spectacular "glamour practices" that receive a great deal of publicity. Sometimes this publicity is precipitant and arouses the desire among ranchers for widespread application prior to adequate development of practical techniques and observance of trial results.

Group 2 (*Enabling or facilitating practices*) contains practices such as: (a) Water developments, (b) Fences, (c) Salting away from water, (d) Herding and riding, (e) Feed reserves. They assist in the application of forage management. Generally, they are being applied as a result of ranchers' recognition of their need. Frequently, however, it is necessary to re-adjust, improve, or initiate these practices to fit into the conservation program of forage management.

Group 1 (*Forage management practices*) contains such practices as: (a) Rotated deferred grazing, (b) Proper seasonal use, (c) Proper utilization. These are the practices that really pay off in maintaining forage production and economic returns. For example, regardless of how many acres are reseeded,

if the forage produced is not managed in such a way as to maintain production, the effort is uneconomical and impractical. These practices usually do not show immediate results such as those of Group 3. It may even take several years before improvement is apparent if they are initiated on a forage site that has been allowed to deteriorate to a *poor* condition. These practices require a fairly thorough understanding of the ranching operations. They cannot be applied to the ground properly without field investigation and careful study. They will not be applied by the rancher unless he understands what the practice will do and assists in working out its application to his ranch.

To apply these *Forage management practices* properly we must consider the growth requirements of the grass. Basic plant physiology and recent experimental study emphasize several important characteristics of grass growth that help determine whether grass forage will deteriorate, improve, or maintain production under grazing use.

Let us consider the familiar growth curve, commonly called an S-curve by physiologists (Fig. 1). This curve shows the rate of growth of the grass plant during the growing season. It is characterized by a period of slow development in the spring, followed by a period of rapidly increasing growth and

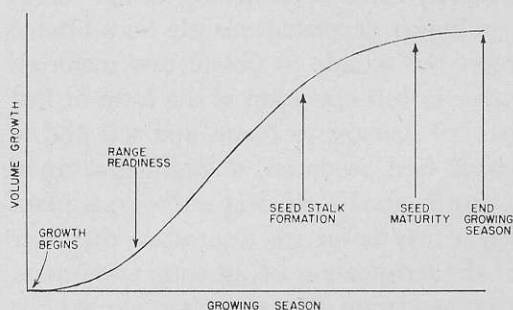


Fig. 1.—General growth curve of grass during growing season.

	SPRING	SUMMER	FALL
PASTURE 1	1 MONTH		1 MONTH
PASTURE 2		2 MONTHS	
PASTURE 3			2 MONTHS

Fig. 2.—Simple rotated deferred grazing season.

then a gradual tapering off in the early summer. The slow development period in the spring covers several weeks, depending upon the weather. At the beginning of this period the food for plant growth comes from the storage in the root system, because the soil temperatures are too cold for root activity. When the air and soil temperatures become warmer, the root system begins to take raw plant nutrients out of the soil and transport them to the leaves, where, in the warm sunlight, they are made into food for plant growth. The increase of leaf growth at this stage is in reality an increase in the size and producing capacity of the plant food factory. And this is where the growth curve starts to rise very rapidly. This rapid rate of top-growth increase continues until the grass begins to form seed stalks and then it begins to taper

off. This tapering off is partly due to the increasing demand on the supply of plant food being manufactured for the formation of seed stalks, flowers, and seeds. And, as this drain increases, the curve flattens out and the rate of top growth is decreased. Also affecting this reduction of top growth is the gradual termination of optimum growing conditions.

Not all of the plant food manufactured in the leaves of the grass goes toward the production of top growth, however. About the time the growth curve starts its rapid rise, the grass begins to replenish its store of reserve plant food in the root system for use early the next year. During the period of rapid top growth and seed production, only a little of the plant food goes back into storage. But, during and after seed maturity, this storage process increases and continues until growing conditions have ceased. In addition to the storage of food, some of the plant food returned to the root system during the growing season goes into the growth of the new grass roots which replace the part of the root system that dies annually.

These well known points of grass physiology are reflected in the *Forage management practices* listed in Group 1. *Proper seasonal use* includes the recommendation that grazing be delayed on the grass forage until about the time the growth curve begins to rise rapidly. This is commonly called "range readiness." At this stage, the grass is no longer dependent mainly on a limited supply of plant food stored in the roots but is able to obtain raw materials from the soil and has a plant food factory in full operation in the form of leaf growth. In addition to possible mechanical damage to plants and soil and to the low volume and quality of livestock feed produced, to begin grazing at an earlier date and keeping the leaf growth grazed off delays the grass plant in its natural growth cycle, after which it may never get to produce that very important food for storage because of the termination of growing conditions.

Proper utilization includes the recommendation that some top growth be left on the ground at the end of the grazing period. During the growing season this gives the plant some leaf growth to function as a food factory while moisture is still available in the soil. And it allows for residue and plant litter to remain on the ground for soil protection and improvement and for moisture conservation. The amount of ungrazed material required to accomplish this varies with the degree of intensity in the problems of soil stability, amount and seasonal distribution of moisture, etc. To violate these requirements of grass physiology repeatedly by grazing too early and keeping the grazing too close during the growing season will result in a weakening of the grass plant that leads to a deterioration of site condition and forage production.

To demonstrate how a properly applied system of *Rotated deferred grazing* takes practical advantage of these requirements of grass growth, let us

consider a simple example of three pastures that are grazed for three general seasons: spring, summer, and fall (Fig. 2). For purposes of illustration, assume that each grazing season covers two months and all of the three pastures are equal in grazing capacity and are suitable for use in any of the three seasons. The stock are removed from Pasture 1 after half the total estimated grazing capacity has been removed in the spring. This allows the forage to complete as much of its natural growth cycle as possible during the remainder of the growing season. When the stock are moved to Pasture 2, the forage is well developed and the volume production of good feed is high. The full estimated grazing capacity of this pasture is removed. The stock are then turned in on Pasture 3, which has been deferred until seed maturity, and the full estimated grazing capacity is removed. The grazing season is completed by turning the stock back into Pasture 1 to utilize the mature forage produced during the growing season and whatever fall regrowth occurs. Rotation of this deferment is accomplished as follows:

1st year:	Pasture 1	spring-fall use
	Pasture 3	deferred
2nd year:	Pasture 3	spring-fall use
	Pasture 2	deferred
3rd year:	Pasture 2	spring-fall use
	Pasture 1	deferred

Obviously, such a simple system of rotated deferred grazing would rarely, if ever, actually apply to a ranch. It would be complicated by areas of forage primarily suitable for either spring, summer, or fall use; by stock being grazed on federal range at various seasons, or on leased lands; by use of supplemental irrigated pastures, hay aftermath, grain stubble, etc. These variations can easily be included in the grazing program and the principles of management still applied to the bunchgrass type forage. The benefits of such a rotated deferred system of grazing on bunchgrass forage can be summarized as follows: (1) More intense grazing for shorter periods reduces selective grazing of good grasses, promotes more uniform use, and reduces wasted forage. (2) The important forage grasses are given the same consideration regarding their needs for maximum production as are given the livestock and their needs for maximum production. (3) An increased forage and livestock production results, and the forage supply is more dependable. (4) By favoring the better grasses, the livestock are favored with abundant and nutritious forage, which in turn favors the ranch income.

Occasionally there is criticism of a rotated deferred grazing system on bunchgrass forage as being impractical from the livestock management angle, and there most certainly have been some impractical recommendations made along this line. This criticism may have come about because, (1) The livestock

operator did not understand what the system was designed to accomplish.

(2) The recommended so-called rotated deferred system ignored the requirements of grass forage growth and no favorable results were obtained.

(3) The grazing management plan was developed with inadequate understanding of the operations and without benefit of the rancher's help and his many years of experience in livestock operations.

The rancher wants to raise more good forage per acre if he can be shown a practical way of doing it.