CHAPTER 18

OBJECTIVES

At the end of this chapter, students should be able to:

â—† state the meaning of rangeland.

â—† list the importance of rangeland.

â—† state the characteristics of rangeland.

â—† mention some common grasses of livestock in rangeland.

â—† state factors affecting the level of production of herbage.

â—† explain methods of rangeland and pasture improvement.

18.1 Introduction

Raising livestock on extensive rangelands is a major activity in agriculture. The term rangeland is used to describe a predominantly herbaceous plant community. It affords extensive grazing pasture for animals like cattle, sheep and goats.

18.2 Meaning of Rangeland

It may be defined as an extensive area of land covered by grasses, legumes together with some trees, shrubs and herbs where animals (ruminants) can graze or browse freely. It is a natural grassland where herbage (pasture) are not cultivated but grow naturally. The nomadic herdsmen in Nigeria graze extensively on the natural grassland. The provision of a large supply of forage for livestock is of great importance to enhance productivity. The management and improvement of rangeland are essential to achieve the goal of continuous supply of herbage to the animals.

The savannah region of Nigeria is predominantly grassland, with short and scattered trees. During the dry season, the grasses become dormant and dry out and the scattered trees lose their leaves. Fires burn over much of the grassland during this period and hinder the spread of woods. The presence or absence of certain plants on the range shows how the range has been used and what should be done to maintain or improve it.

18.3 Importance of Rangeland

1. Rangeland provides the main bulk of feed for ruminants (cattle, sheep and goats).

2. Legumes in the rangeland increase soil fertility by nitrogen fixation. Also, the droppings of animals and decayed leaves improve the fertility of the soil.

3. Rangeland plants cover the soil all year round thereby preventing soil erosion.

4. Most forages are medicinal and are used in the manufacture of drugs and chemicals.

5. Dry grasses and straws are good source of bedding materials in animal husbandry especially

during parturition and cold weather.

6. Some pasture plants are used in the making of ornaments, such as wreaths and interior decorations.

7. Rangeland allows the animals to exercise their body.

8. Grasses and legumes in the rangeland can be cut and preserved as hay or silage for future use.

9. Rangeland affords the animals the opportunity of mating without the supervision of the livestock attendant.

10. Land that cannot be used for crop production can be put to rangeland establishment for animals.

11. Rangeland provides shelter for wild animals.

12. Rotational and deferred grazing can be practised if the rangeland is fenced; this will help to control disease and pests.

18.4 Characteristics of Rangeland

1. It contains no planted or sowed species of plants (pasture) but naturally grown species.

2. It includes forest containing a sparse coverage of low growing plants and woodland with a light grass cover.

3. It also includes savannah bearing conspicuous grass cover but containing woody plants.

4. It may consist of true grassland where woody plants may be absent.

5. The plant community comprising grasses, legumes and other herbs has high tendency to regenerate over seasons.

6. It contains high-quality grasses, legumes and other herbage.

7. Rangeland plants can withstand trampling by farm animals.

8. Rangeland plants cannot be easily eradicated.

9. It is an unstable and constantly changing grassland where re-growth is usually stimulated by burning.

TABLE 18.1 Common grasses of livestock in rangeland

Grasses	Botanical Names
Southern gamba grass	*Andropogon tectorum*
Northern gamba grass	*Andropogon gayanus*
Giant star grass	*Cynodon plectostachyus*
Bahama grass	*Cynodon dactylon*
Elephant grass	*Pennisetum purpureum*
Guinea grass	*Panicum maximum*
Carpet grass	*Axonopus compressus*
Spear grass	*Imperata cylindrica*

FIGURE 18.1 **Common grasses of livestock in rangeland**

TABLE 18.2 **Common legumes of livestock in rangeland**

Legumes	Botanical Name
Stylo	*Stylosanthes gracilis*
Centro	*Centrosema pubescens*
Puero	*Pueraria Phaseoloides*
Calopo	*Calopogonium mucunoides*
Mucuna	*Mucuna utilis*
Sun hemp	*Crotalaria juncea*
Greenleaf desmodium	*Desmodium intortum*

FIGURE 18.2 **Common legumes of livestock in rangeland**

18.5 Factors Affecting the Level of Production of Herbage

The productivity of herbage is affected generally by the following factors:

1. Rainfall: This is very essential for the growth of the forage. It helps in luxuriant growth of pasture thereby increasing harvest. It influences the type of grass legume species found in an area.

2. Soil factors: The type of soil formed determines the moisture availability of that soil and pasture

community. Fertile soils sustain forage that is palatable and of high nutritive value, but infertile soils support the growth of stunted forages.
3. Bush burning: Burning-induced grassland types are common in the tropics. Some valuable pasture species are killed by fire and repeated burning leads to herbaceous cover.
4. Land clearing: Men remove trees and shrubs for the purpose of fuel wood and shelter or clear land for cultivation of crops. The amount of pasture available for grazing and the amount of tree foliage are related to the density of tree cover. Destruction of edible trees and shrubs lowers the stock-carrying capacity f rangelands.
5. Mode of grazing: The grasslands of Nigeria are undergrazed by the natural ruminant population and so are generally of high quality. Overgrazing or increased grazing pressure caused by the introduction of domestic animals has caused great changes in grassland communities. Some grassland have been destroyed absolutely and others have been improved by skilled manipulation of livestock.
6. Disease and pests: The yield and nutrient quality of herbage can be reduced by diseases and pestsâ€™ incidence. Disease and pest control increases the yield and productivity of herbage.
7. Presence of weeds: Weeds growing on rangeland can reduce its productivity. They affect the growth of pasture plants by competing with them for space, nutrients, air, light and moisture. Some are harmful to animals and reduce the value and yield of the pasture.
8. Grass and legume mixture: The composition of legume and grass in a rangeland can affect the yield and productivity of the rangeland. In grass and legume mixture, grasses easily cover and suppress legume forage, less than grasses when grazed. Grass and legume mixture are introduced for the purpose of enhancing its nutritive quality. The legume should be established before the grass.
9. Resistance to drought: The ability of a herbage species to withstand drought over a period of time can determine the yield and productivity of rangeland. Pasture species that are resistant to drought are more productive.
10. Seed viability: The ability of pasture seeds to germinate when planted increases the productivity and yield of the rangeland.
11. Management practices: Proper management procedures can enhance the yield and productivity while poor management will result in low yield.

18.6 Methods of Rangeland and Pasture Improvement

Rangeland improvement involves changing the environment in which pastures grow to make it more productive. The following are methods commonly adopted in rangeland improvement programmes:

18.6.1 Use of fertilizers

The use of fertilizers will increase the production of herbage by allowing the leaves to grow and develop for grazing. This is a regular practice in many parts of the world, but due to the cost they are hardly used on rangelands in developing countries.

18.6.2 Irrigation

The rangeland should be irrigated during the dry season to enhance the establishment of a luxuriant forage. It also allows for the availability of fresh and succulent pasture throughout the year.

18.6.3 Controlled burning

This supplies potassium to the soil and also destroys undesirable plants (weeds) in the rangeland. It enhances or hastens the regeneration of forage plants. It helps to kill disease pathogens of forage plants.

18.6.4 Removal of weeds

Weeds in rangeland should be removed regularly to prevent competitions between weeds and forage for nutrient, space, light, air and moisture.

18.6.5 Stocking density

It is advisable to allow or put definite number of animals on a specific hectarage of grassland. Overstocking brings about overgrazing, while adequate stocking increases the quality of grass available for grazing in a rangeland. The stocking should be controlled

18.6.6 Reseeding

This is important because grazing decreases the availability of high-quality foliage. It is a good practice to clear the overgrazed areas and plant them up with high-quality seeds. It will provide new and fresh pastures for grazing.

18.6.7 Paddocking or fencing

This enhances an improved system of stock management by separating different classes of stock. The pasture or rangeland should be fenced into smaller unit (paddocks) for thorough feeding and sufficient growth before being grazed. It prevents the deterioration of pastures by overgrazing and enables the farmer to practise rotational grazing and deferred grazing. It can also be used for the preparation of hay and silage.

18.6.8 Proper grazing

For proper grazing the following rules that govern the science of range management should be observed:

i. Balance the number of animals with the available forage supply.

ii. Use the kind of animals most suited for the forage supply.

iii. Alternate periods of grazing and non grazing periods to maintain vegetation.

iv. Ensure uniform distribution of animals over the entire range. Overgrazing brings about impoverished soil. Grazing can be continuous, rotational or deferred.

â Continuous grazing refers to the condition in which a herd graze on area all the year round utilising different herbage species in different season.

â Rotational grazing is a system where a given area is sub-divided into paddocks and the herds are moved from paddock to paddock at regular intervals or at irregular intervals according to the seasonâ€™s production.

â Deferred grazing is when an attempt is made to renovate or improve a deteriorated grassland. Grazing is deferred sufficiently to allow the desirable species to mature and produce seeds or spread vegetatively without any disturbance.

18.6.9 Soil conservation

Soil conservation techniques such as crop rotation and application of organic manures lead to improvement of soil structures, prevent soil erosion and increase the productivity of the range. Organic matter also decomposes to humus which improves the structure of soil and enhances the

absorptive ability thus reducing erosion.

18.6.10 Grass–legume mixture

Grass–legume mixture is essential in rangeland improvement. This will provide balanced feed for the animals. The legumes will improve the dry matter and protein intake of the grazing animals. Legumes also add nutrients to the soil which prevent total loss of soil fertility.

Activity

Visit a nearby rangeland or a livestock farm (cattle, sheep and goats) and

a. Identify the various types of pastures on the rangeland.

b. Count the number of animals grazing on the range to know the capacity and size of the rangeland.

c. Identify the types of grazing techniques adopted in the farm. Record all your observations in your notebook.

SUMMARY

â—† Rangeland is an extensive grazing area for animals such as cattle, sheep and goats

â—† A good rangeland has the following characteristics:

â—† Absence of sown or planted species, sparse coverage of low growing plants and woodland with light grass cover, savannah type of grasses abound, woody plants absent.

â—† Rangeland provides food for animals and also brings about soil fertility with the presence of legumes.

â—† Legumes and grasses in the rangeland help to prevent erosion of fertile soils.

â—† The factors that can affect rangeland productivity may include rainfall, soil factors, bush burning, land clearing, grazing, disease and pests.

Rangeland can be improved by adopting the following methods: use of fertilizers, irrigation and controlled burning among others.

Revision Questions

Essay Questions

1. (a) What is rangeland?

(b) State fi ve characteristics of a rangeland.

(c) List four grasses and three pasture legumes commonly found in rangeland.)

2. Discuss seven practices of management and improvement of rangeland.

3. (a) Enumerate five importance of rangeland.

(b) Discuss five factors that can affect production of herbage in rangeland.

4. In what way or ways would a range manager improve the rangeland to suit his goals?

5. (a) Discuss the practice of paddocking as a way of improving rangeland.

(b) Write the scientific names of the following pasture plants:

(i) Elephant grass

(ii) Stylo

(iii) Mucuna

Objective Questions

1. Which of the following practices is not a method of improving rangeland?

(a) Rotational grazing
(b) Removal of weeds
(c) Reseeding
(d) Overgrazing

2. Livestock are said to feed on the rangeland when they eat
(a) fresh herbage at the milking parlour.
(b) fresh herbage directly from the pasture.
(c) harvested herbage in a stall.
(d) preserved herbage in the form of silage.

3. The following are common grasses in the rangeland except
(a) *Panicum maximum*
(b) *Calopogonium mucunoides*
(c) *Cynodon dactylon*
(d) *Imperata cylindrical*

4. Methods of rangeland improvement which ensure continuous herbage growth during the dry season are
(a) reseeding and pest control.
(b) controlled stocking and disease control.
(c) rotational grazing and weed control.
(d) fertilizer application and irrigation.

5. Which of the following is not an objective of pasture management? To obtain
(a) The lowest possible dry matter yield of pasture
(b) The most palatable mixture of pasture crops
(c) High leaf–stem ratio
(d) The best possible nutritive value of pasture

6. The effects of practising rotational grazing in a livestock farm include the following except
(a) controlling livestock pests.
(b) eliminating attack of livestock diseases.
(c) allowing the re-growth of pasture crops.
(d) maintaining steady increases in growth rate of animals.

7. A large expanse of land where natural forage is allowed to grow for grazing is called
(a) rangeland.
(b) orchard.
(c) plantation.
(d) farmland.

8. The botanical name of Bahama grass is
(a) *Cynodon dactylon.*
(b) *Axonopus compressus.*
(c) *Panicum maximum.*
(d) *Andropogon tectorum.*

Answers to Objective Questions

1. d 2. b 3. b 4. d 5. a 6. d 7. a 8. a