

Unit I – Grasslands and Grassland Plants

Lesson 4: Grassland Composition

Grassland composition and forage quality are two ways in which an area can be evaluated for production. In combination with soil and land evaluation (covered in Unit II), they form the evaluation process used in grassland management.

Importance of Grassland Composition

Grassland composition refers to the quality and variety of plants that grow in the grassland. Determining grassland composition is important because understanding the current condition of the grassland helps a producer estimate its potential for livestock production and wildlife management. The quality of the plants that make up a pasture affects the quality of the livestock produced and the wildlife found in the area. Many economic benefits may be gained from maintaining high quality pastures, while nonmonetary benefits may result from providing a good habitat for wildlife.

Knowing the plant composition of the grassland also has other benefits. Examining grassland composition allows the grassland manager to determine the length of the grazing season based on the seasonal growth of the plants. The grassland manager can also use his or her knowledge of grassland composition to adjust the plant composition of pastures to reach the optimum economic yield from production and achieve the most successful wildlife management. This adjustment involves modifying the current composition to match the ideal composition. Improving the composition to improve the quality of the plants and lengthen the grazing season can improve the use of the land.

Components of Grassland Composition

Determining grassland composition can be done by making a visual appraisal of a given area of land. Overall, the more leafy the stand, the higher the quality.

A more specific method of making an appraisal of grassland composition is to use a stick to find the percentages of different plants in the grassland. The person doing the evaluation takes 10 steps in a random direction at

a representative spot in the grassland. The stick is then placed on the ground on end. Whatever plant the tip lands on should be recorded, and the total number of each of the plants the stick touches should be tallied in a systematic way. At least 10 to 20 determinations should be made. The percentage of each plant in the grassland can then be calculated.

The dominant plants in grasslands are usually grasses and legumes. These plants are the main forage crops. They may be grown in single stands or in mixtures in which two or more forage crops dominate the grassland. Stands composed of only one plant species are of less value to livestock and wildlife. Cool-season and warm-season grasses are not often mixed in the same stand because this combination is difficult to maintain.

Grassland plants not beneficial to livestock production goals are considered to be weeds. Weeds may be any type of plant that is not desired for production. It is important to remember, however, that wildlife may have uses for the plants many people think of as weeds; some of these plants may also have nutritive value for livestock.

Grassland Viability

The needs of livestock and wildlife in the grassland are very similar. They share the same basic needs for food, shelter, and water, although the specific kinds of food and shelter required by livestock may differ from that required by wildlife.

Quality food – A grassland must provide quality food to sustain a population of animals. Nearly all the different parts of plants are eaten by one animal species or another. Livestock need a quality stand of forages, including warm-season grasses, cool-season grasses, and legumes, to sustain the herd. Wildlife usually require a greater mixture of plants, since different animals may feed on leaves, stems, twigs, bark, roots, fruits, seeds, insects, or small mammals supported by these plants

Shelter – In grasslands, shelter provides protection from harm. Livestock use shelter to reduce the effects of sun, heat, wind, and cold. In addition, wildlife need shelter for nesting and protection from predators. The terrain of the

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land and large plants like trees provide shelter. Wildlife also find safety in brush piles and nearby woods and among tall grasses.

Water – Clean, uncontaminated water is necessary for sustaining all animals in the grassland. Water quality in ponds, streams, and groundwater is influenced by the surrounding vegetation. Proper grassland management helps maintain quality water in these sources by preventing erosion, limiting runoff, and filtering nutrients and wastes.

Livestock require a source of surface water. The best source is from a freeze-proof water tank located below a pond or at a water hydrant. Some species of wildlife, such as deer, can drink from streams or ponds, while others, like quail and rabbits, obtain most of their moisture from berries, plants, or even dew.

Forage Quality

Forage quality refers to the nutritive value of the forage needed to produce a desired level of animal performance. The type of performance will depend on the use of the animal. It could be milk production (lactation) for dairy cattle, gain for beef cattle, or work for horses.

A detailed chemical analysis can be run on a forage to measure its quality. This test measures several items.

- ◇ Moisture – Testing can reveal the amount of water present in the forage.
- ◇ Crude protein (CP) – Crude protein includes both true protein and non-protein nitrogen. The percentage of crude protein indicates the ability of the forage to meet an animal's requirements for protein.
- ◇ Acid detergent fiber (ADF) – Acid detergent fiber indicates the percentage of plant material that is indigestible. A low ADF is preferred, because as it increases, the forage becomes less digestible and contains less energy.
- ◇ Neutral detergent fiber (NDF) – Neutral detergent fiber refers to the percentage of structural or cell wall material in the forage. A low NDF is preferable, since it correlates to increased food intake.

- ◇ Total digestible nutrients (TDN) – Total digestible nutrients represent the percentage of digestible material in the forage. The higher the ADF is, the lower the TDN will be.
- ◇ Net energy for lactation (NE_l) – This measurement indicates the energy available in a forage to meet the requirements of lactating cows.
- ◇ Net energy for maintenance (NE_m) – Net energy for maintenance indicates the energy available in a forage to meet the requirements for maintenance in meat-producing livestock.
- ◇ Net energy for gain (NE_g) – This measurement indicates the amount of energy available in a forage to produce growth or gain.

These levels will vary according to a number of factors that affect forage quality. The plant's stage of growth is the most important factor. Plants that are young are of higher quality than older, more mature plants. As plants mature, they produce more stem than leaves. The nutritive value of the forage crop decreases with increased maturity because the plants have more indigestible material due to their higher fiber content.

Another important factor is the type of forage. Plant species differ in their digestibility and energy content. For example, legumes tend to be higher in digestibility than grasses.

A third factor affecting quality is the growing conditions for the forage. The surrounding environment plays a role in determining the value of the plants for forage. The temperature, amount of sunlight, and amount of rainfall all have an effect.

The presence of noxious weeds also has an effect on forage quality. Weeds affect intake by livestock because they are less palatable. They are also less nutritious than desired forages.

Summary

The evaluation of grassland composition allows a producer to estimate the potential for livestock production and wildlife management, determine the length of the grazing season, and modify the plant composition. Determining

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grassland composition can be done by making a visual appraisal of the land. Grassland viability is also important; livestock and wildlife require food, shelter, and water from the grassland. The quality of the forage on the grassland is vital, since it affects the level of performance of livestock. Factors that influence forage quality include stage of growth, plant type, growing conditions, and the presence of noxious weeds.

Credits

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