UNIT IX - FORAGE PRODUCTION

Lesson 5 : Selecting a Grazing System

**Competency/Objective:** Identify various forage grazing methods.

**Study Questions**

1. What are the various grazing systems currently used to maintain optimum production?
2. How do water resource locations influence grazing patterns?
3. What determines the livestock carrying capacity of a grazing system?
4. How are cow-calf days calculated for warm- and cool-season grasses?
5. How do different grazing patterns influence cow-calf days?

**References**

1. *Advanced Crop Science* (Student Reference). University of Missouri-Columbia: Instructional Materials Laboratory, 2000, Unit IX.

2. Transparency Masters
   a) TM 5.1: Basic 140-Acre Grazing Unit
   b) TM 5.2: Simple 4-Paddock Grazing System
   c) TM 5.3: A 12-Paddock Intensive Grazing System

3. Activity Sheet
   a) AS 5.1: Determining Carrying Capacity
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Lesson 5: Selecting a Grazing System

TEACHING PROCEDURES

A. Review

The previous lessons dealt with establishing the forage, selecting the forage and its variety, preparing soil and planting, and maintenance. This lesson will discuss considerations that must be made when grazing the forage and how to maximize its production.

B. Motivation

Ask students if they can list factors to consider when determining the grazing of a specific forage. If they had a pasture of a certain size, how would they manage its production with a herd of 100 cows? Would they divide it into paddocks? How many cows would it support?

C. Assignment

D. Supervised Study

E. Discussion

1. Ask students to identify grazing systems they are familiar with.

What are the various grazing systems currently used to maintain optimum production?

a) Continuous grazing systems - traditional method of using single or few pastures for full season grazing
   1) Advantages
      (a) Higher initial animal performance due to selective grazing
      (b) Low maintenance
   2) Disadvantages
      (a) Pasture composition altered by selective grazing
      (b) Poor forage utilization

b) Rotational grazing systems - sequenced movement of animals between two to seven smaller pastures
   1) Advantages
      (a) Match grazing to plant growth
      (b) Provides rest periods for desirable plants
      (c) Increases forage and animal production
      (d) Reduces brush invasion
      (e) Set aside fields for haying and fall stockpiling
   2) Disadvantages
      (a) Requires more time and labor to manage
      (b) Requires additional expenses in fencing, waterers, and maintenance

c) Management intensive grazing (MIG) system - a form of rotational grazing using a short duration (5-day) rotation between pastures
   1) Advantages
      (a) Maintains desired pasture composition
      (b) Causes less damage from compaction
      (c) Higher production per acre than traditional rotation grazing

*Advanced Crop Science, IX-45*
(d) Provides for longer regrowth periods
(e) Allows operator more contact with animals allowing for identification and correction of potential problems

2) Disadvantages
(a) Requires more time in planning and management
(b) More expenses in fencing construction and maintenance

2. Any forage system used for grazing must consider what water resources are available for the herd. Refer to TM 5.1, 5.2, and 5.3 to explain grazing systems.

**How do water resource locations influence grazing patterns?**

a) In a continuous grazing system, the water resource may be a pond or deep well with total herd access.
b) In a rotational grazing system, modifications must be made with fencing to allow the herd to move from a specific paddock or section of pasture to the water supply.
c) Additional modifications to increase paddock numbers may require the producer to extend water lines and provide water tanks to individual pastures.
d) The use of alleyways may cause certain problems.
   1) Soil erosion for animal traffic in a concentrated area
   2) Weed infestation such as thistles and nettles
   3) Manure in alleyway instead on pasture, losing its nutritive effect

3. The type of livestock grazing system used will partly depend upon the carrying capacity of the pasture, which is the ability of a forage system to support a specific number of animals throughout a grazing season. Ask students how the livestock carrying capacity of a grassland is determined. Have students complete AS 5.1.

**What determines the livestock carrying capacity of a grazing system?**

a) Carrying capacity = \( \text{Annual forage production} \times \text{Seasonal utilization} \)
\( \frac{\text{Average daily intake}}{\text{Length of grazing season}} \)
b) Annual forage production - amount of forage dry matter produced per acre
c) Seasonal utilization rate - percentage of the forage produced that will be consumed by the animals in 1 year
d) Average daily intake - percentage of the animals’ body weight consumed in forages on a daily basis
e) Length of the grazing season - days of grazing per year

4. Producers with planned forage systems need to be able to determine how many animals the system will support for grazing.

**How are cow-calf days calculated for warm- and cool-season grasses?**

a) Steps to calculate “cow-days”
   1) Look at the pasture and determine if it is thin, average, or thick.
   2) Measure or estimate the height of the pasture.
   3) Subtract from the total height the height of the stubble the animals should leave.
   4) Multiply the difference between starting height and ending height by the cow-days per inch to figure available cow days/acre.
   5) Divide the number of cows in the herd by cow-days/acre to determine how much area should be allocated.
b) Adjustments for different classes of livestock and different weights
5. Adjust the number of days the animals may be on the pasture, depending on certain differences among herds.

How do different grazing patterns influence cow-calf days?

a) Size of the pastured area
b) Amount of forage or stand density
c) Size or weight of the animals

F. Other Activities

1. Plan a field trip to a well-managed intensive grazing program within an acceptable driving distance if available. If not, obtain pictures (slides) to show the class such a grazing program. Pictures or slides of pastures showing extreme differences in grazing stages would be valuable.

2. Have the students research types of forages that complement each other in a grazing system. Use the Missouri Grazing Manual (M157) available from the University of Missouri Extension as a reference.

G. Conclusion

Forage producers have several methods of grazing their pastures. It could be with conventional grazing with a large herd on one large unit of land or the grazing area could be divided into smaller, separate pastures or paddocks for a managed grazing program. The producer must understand how these grazing systems are different and plan for these differences to maximize the use of the forages available to the animals.

H. Answer to Activity Sheet

\[
7200 \times 0.60 = 4320 = 804.47 \text{ pounds of liveweight/acre}
\]

\[
0.03 \times 179 = 5.37
\]

I. Answers to Evaluation

1. Continuous - Grazing the herd in one large pasture with a central water source.
Rotational - Dividing the large pasture into two to seven smaller units and provide access to water source.
Management intensive grazing - Dividing the large pasture into eight or more smaller units and providing access to the water source.

2. (a) Supplied by a pond or water tank in the continuous grazing system,
(b) Allow animals access to the water source through an alleyway from the smaller pastures in a rotational or management intensive grazing system,
(c) Run water lines and provide water tanks in the individual paddocks in a management intensive grazing system.

3. Annual forage production, seasonal utilization rate, average daily intake, and the length of the plant growing season.

4. Any two of the following: size of the pasture, forage density, and/or animal size (weight).

5. c
6. b
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EVALUATION

Complete the following short answer questions.

1. List and define the three basic grazing systems used in Missouri.
   a. 
   b. 
   c. 

2. Explain three ways that water may be made available to animals on different grazing systems.
   a. 
   b. 
   c. 

3. List the four factors used to determine the carrying capacity of a grazing system.
   a. 
   b. 
   c. 
   d. 

4. What are two major factors that influence the number of cow-days of grazing on a given pasture?
   a. 
   b. 

Circle the letter that corresponds to the best answer.

5. Animals that have water available in their individual grazing pasture and do not have to travel an alleyway to the water source drink about ________________ percent more water on a daily basis.
   a. 5-10
   b. 10-15
   c. 15-20
   d. 25-30

6. A 1,000-pound lactating cow should eat about __________ pounds of forage per day.
   a. 20
b. 30
c. 40
d. 50
Basic 140-Acre Grazing Unit
Simple 4-Paddock Rotational Grazing System
12-Paddock Intensive Grazing System
Determining Carrying Capacity

**Objective:** Students will be able to determine the number of animals that may be supported by an acre of forage.

**Directions:** Read the information given in the scenario. Use the formula given in the Student Reference and determine the carrying capacity (pounds of liveweight/acre) for a given pasture.

The producer has a forage pasture that will produce about 7200 pounds of forage annually. Our planned grazing period will be 15 days in length, yielding a seasonal utilization rate of 60 percent (see Figure 5.4 in the Student Reference). The livestock will be steers gaining 1.5-2.0 lb./head/day; therefore, their intake is entered at 3 percent of bodyweight or .03 lb. of forage/lb. of liveweight. We anticipate grazing the steers from April 15 to October 10, or a total of 179 days.

The carrying capacity for an acre of this forage will be __________________________.

(Show work below)