K-STATE Kansas State University Research and Extension

FORAGE FACTS

Publication Series

ESTIMATING CROP RESIDUE AVAILABLE FOR GRAZING

INTRODUCTION

Utilizing livestock to consume excessive residue is an efficient way to manage crop aftermath. Knowing the quantity of residue initially available and how much residue should remain to provide adequate protection of the soil allow the producer to determine how much residue is available to be consumed by livestock.

DETERMINING THE AMOUNT OF CROP RESIDUE

There are several ways to determine the amount of residue on a particular field. The methods can range from scientifically measuring the amount of residue on a field to simply calculating the quantity of residue produced based on harvested grain yield. The initial evaluation of residue quantity is important to estimate the quantity of feed available to livestock.

When measuring the quantity of residue, several samples should be collected from a quadrant or a known area and weighed. Having a weight from a known area will allow a conversion to pounds per acre. Residue does contain moisture and should be dried before weighing to determine pounds of dry matter per acre.

An easy way to estimate pounds of residue is to make a template from pliable rod or material that is 132 inches long and can be bent to form a circle. The circular template will have a diameter of 42 inches. The area within the circle is a unique size because the weight of the dry matter residue within this circle, weighed in grams and multiplied by 10, will equal pounds per acre. For example, if 800 grams of residue dry matter are collected from within the circle, there are approximately 8,000 pounds of residue dry matter per acre available for grazing.

A second method to estimate the quantity of residue present is based on calculations with residue index factors relating to grain yields. These values are found in Table 1. Residue indices are simply prediction numbers and measuring the residue is more accurate. Residue produced per bushel of grain harvested varies because of environmental conditions, therefore, the calculation method is an estimate of the residue produced and available in a field.

The following is an example of calculating the quantity of residue based on the residue indices:

70 bushel grain sorghum crop
grain sorghum has a residue index of 60
$70 \times 60 = 4200$ pounds of residue per acre
approximately 50 percent of the residue is removed
2,100 pounds of residue per acre are available for livestock removal

Table 1. List of crop residue index values. Multiply index by bushels of grain produced per acre for an estimate of available residue.

Residue Crop	Index*
Wheat	100
Corn	60
Grain Sorghum	60
Oats	55
Soybeans	45
Sunflower	1.5

* Residue index = pounds of residue produced / bushel of grain produced

DETERMINING PERCENT COVER

Residue is essential because it reduces soil erosion from wind and water, therefore, it is important to keep some residue in the field. The amount of residue required to minimize erosion varies with the type of residue present, type of soil, the slope of the land, and the presence of barriers (terraces, windbreaks, etc.) which affect the potential for wind and water erosion.

An accurate method of determining percent cover is the transect method, which involves stretching a 100-foot tape across the field at a diagonal to the run of the row. The number of foot marks that are directly over a piece of residue should be counted. If it is slightly off to the side of a piece of residue, it should not be counted. Beginning at the 1-foot mark and ending at the 100-foot mark, 100 sites should be examined on the tape. For every mark that is over a piece of residue, a 1 percent cover is estimated. Therefore, if 30 marks lie directly over residue, a 30 percent cover would be estimated. This should be done at several locations in the field to accurately estimate percent cover. A second method is visual evaluation. Publications by Kansas State University and the National Resource Conservation Service (NRCS) are available with photographs representing various levels of residue cover.

EFFECT OF GRAZING ON SOIL COMPACTION.

Grazing livestock can cause soil compaction, but generally the compaction is shallow and temporary. Soil moisture and soil type are the two main factors which affect the severity of the compaction. Moist soils with significant clay content are most prone to compaction and are often referred to as “tight” soils. Completely saturated soils or dry soils do not compact. The winter freeze/thaw and spring tillage will eliminate most compaction created by livestock.

OTHER PUBLICATIONS

Soil & Water Conservation Software RES-N-TILL USER MANUAL, V 2.2. Department of Agronomy, Kansas State University

Wheat Stubble: What is its value? (MF-2240)

A guide for planning and analyzing a year-around forage program. University of Nebraska Cooperative Extension (EC 86-113)

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