SORGHUM RESIDUE

1,775 lbs/A 1,800 lbs SGe

7,000 lbs/A 80 percent cover 2,200 lbs SGe

1,750 lbs/A 1,000 lbs SGe

2,300 lbs/A 50 percent cover 775 lbs SGe

770 lbs/A 500 lbs SGe

700 lbs/A 30 percent cover 240 lbs SGe

400 lbs/A 250 lbs SGe

590 lbs/A 15 percent cover 200 lbs SGe

Estimating Grain Sorghum Residue

Maintaining crop residue is an integral component of practices to control soil erosion and will be part of most conservation plans written for the conservation compliance provision of the 1985 Farm Bill.

Residue amount can be reported in three ways: percent cover, pounds per acre (lbs/A) and small grain equivalent (SGe).

Percent cover: the percentage of soil surface covered with crop residue; commonly used where sheet and rill erosion (water erosion) is the primary concern and usually evaluated immediately after planting.

Pounds per acre: the weight of clean, dry residue expressed on a per acre basis; can be used where water and/or wind erosion is the primary concern.

Small grain equivalent (SGe): relates the type, amount, and orientation of residue to its equivalent in pounds per acre of small grain residue in a reference condition. (Reference condition is defined as 10-inch-long stalks of small grain parallel to the wind direction lying flat in rows spaced 10 inches apart). Small grain equivalent is commonly used where wind erosion is the primary erosion concern and is evaluated during the critical wind erosion period, usually November through April. The SGe of various residues or crops can be determined by using SGe charts (see Fig. 1 for grain sorghum). To use the chart, find lbs/A of wheat residue on the x-axis, locate the plot of interest, and read the SGe from the y-axis. Example: 2,000 lbs/A of flat grain sorghum residue with leaves is equivalent to 1,025 lbs/A of SGe.

Methods for estimating residue

Estimating residue can be useful in planning field operations to control soil erosion or to determine whether adequate residue remains to qualify for conservation compliance programs. Three methods are described.

Line-transect method: This is an easy, reliable method to determine percent cover. It involves stretching a 50- or 100-foot tape (or string with knots) diagonally across crop rows. Check *directly* under every 1-foot mark or knot for residue. Percent cover is equal to the percentage of marks over residue "hits" compared to the total number of marks evaluated. Example: if 19 out of 50 marks are over residue, percent cover would equal 38. If there is any doubt that residue under a mark could absorb the impact of a raindrop, do not count it as a "hit."

Photo-comparison method: Comparing residue in the field to photographs of known amounts can be used to estimate residue expressed as percent cover, lbs/A, or SGe (see over). Visual estimates must be made looking straight down at the soil surface for flat residue and at an angle for standing residue. Scanning the residue from the road is not adequate and will overestimate residue amounts.

Calculation method: The initial amount of residue after harvest (lbs/A) is calculated by multiplying the grain sorghum residue coefficient (60 lbs residue/bushel grain) by the long-term yield (ex. 80 bu/A grain sorghum is equivalent to 4,800 lbs/A residue after harvest). Percent cover after harvest can be assumed at 90, although actual amount will vary by year, with production practices, and geographically, and should be adjusted accordingly. The initial amount of grain sorghum residue in lbs/A or percent cover can be reduced for overwinter weathering, grazing, tillage and planting operations by the following amounts.

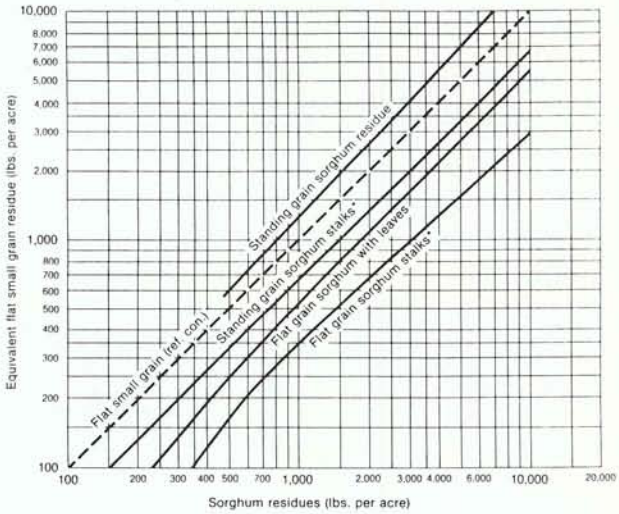
Tillage and planting implements	Percent of residue remaining after each operation
Moldboard plow	10
Chisel plow	
Straight shovel points	75
Twisted shovel points	60
Knife-type fertilizer applicator	80
Disk (tandem or offset)	
3 inches deep	70
6 inches deep	60
Field cultivator	80
Sweep	90
V-blade	95
Rodweeder	90
Planters	
No coulter or smooth coulter	95
Narrow ripple coulter	90
Wide fluted coulter	85
Sweeps or double disk furrowers	80
Drills	
Disk openers	95
Hoe openers	80
Winter weathering	90

Following is an example using the calculation method. This method gives only a rough estimate of residue cover because of the many assumptions involved.

Operation	Residue cover	Residue weight and SGe[1]
After harvest	90%	4,800 lbs/A
Overwinter	x0.90	x0.90
Chisel (straight points)	x0.75	x0.75
Disk (3 inches deep)	x0.70	x0.70
Field cultivate	x0.80	x0.80
Plant (no coulter)	x0.95	x0.95
After planting	32%	1,700 lbs/A (950 lbs/A SGe)

[1]Assuming 80 bu/A grain sorghum (80 bu/A × 60 lb/bu = 4,800 lbs/A)

Figure 1: Small grain equivalents of sorghum residues.



John S. Hickman
Extension Specialist
Soil and Water Conservation

Daryl L. Schoenberger
Extension Assistant
Agronomy

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