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## G95-1134 Estimating Percent Residue Cover Using the Photo-Comparison Method

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# Estimating Percent Residue Cover Using the Photo-Comparison Method

This NebGuide presents photographs and describes how to use the photo-comparison method to estimate the percentage of the soil surface covered with crop residue.

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Leaving crop residue on the soil surface is the easiest and most cost-effective method of reducing soil erosion. Research in Nebraska and other midwestern states shows that leaving as little as 20 percent of the soil surface covered with crop residue can reduce soil erosion caused by rainfall and flowing water by one-half compared to residue-free conditions. Greater amounts of residue cover will further reduce erosion. (Refer to *Residue Management for Soil Erosion Control*, NebGuide G81-544, for further details on the erosion process and the benefits of residue cover.)

Many conservation plans that were developed to meet conservation compliance provisions of the 1985 Food Security Act and the 1990 Food, Agriculture, Conservation, and Trade Act (Farm Bills) specify crop residue management, or residue left on the soil surface, as the primary erosion control method. Generally, the amount of cover required after planting ranges from 20 percent to 65 percent.

It is important to accurately determine percent residue cover to verify effective erosion control and compliance with conservation plan specifications. When accurate determinations are needed, the line-transect method should be used for in-field measurements. (Refer to *Estimating Percent Residue Cover Using the Line-Transect Method*, NebGuide G93-1133, for specific procedures.)

However, in some instances, it may only be necessary to obtain a quick approximation of percent residue cover. An example is when determining whether after-harvest residue cover is closer to 70 percent or to 90 percent or if the cover left after a specific sequence of field operations is close to 40 percent. In these cases, the photo-comparison method can be useful. Percent cover usually can be estimated within 10 to 20 percentage points of the actual cover when using this method.

To use the photo-comparison method, an area of the field is observed, and the residue cover of this area is compared to photographs showing known amounts of cover.

## Using the Photo-Comparison Method

The following is a step-by-step procedure:

### 1. Find a representative area

Select an area that is representative of the whole field. Avoid end rows or small areas of the field that have been adversely affected by flooding, drought, weed or insect infestations, compaction, or other factors that have substantially reduced yields or affected residue cover.

### 2. Look straight down

Look straight down at the residue and soil surface, and determine how much of the surface appears to be covered with residue. Often, it helps to alternately focus on the amount of residue, and then on the amount of bare soil present.

Looking out across the field is not acceptable. Doing this results in overestimating the amount of cover because bare soil may be hidden from view behind pieces of residue.

### 3. Compare the area to photographs of known cover

Compare the residue cover of the area being observed to photographs of known amounts of cover. Photographs of corn, grain sorghum, wheat, and soybean residue covers are shown. (These photographs are of residue laying flat on the soil surface which is most effective for reducing erosion caused by rainfall and flowing water. For wind erosion control, residue standing upright is more effective.)

Determine if the observed cover appears to be less, the same, or more than the cover in each photograph of that residue type. Estimate percent cover of the area being observed from these comparisons.

### 4. Make at least three observations

For improved accuracy, repeat the observation and comparison process in at least three representative areas of the field. Average the individual estimates to obtain an approximation of percent cover for the whole field.

# Photographs for Estimating Percent Residue Cover

## Corn

25%



50%



75%



**90%**



**Grain Sorghum**

**25%**



**50%**



75%



90%



**Wheat**

25%



**50%**



**75%**



**90%**



## Soybean

25%



50%



75%





**90%**



## Summary

Crop residue management, or maintaining residue on the soil surface, is the most cost-effective method of reducing soil erosion available to Nebraska farmers. Accurate estimates of percent residue cover are necessary to determine if sufficient cover is available to adequately reduce erosion and to comply with conservation plan specifications. When accurate estimates are needed, percent residue cover should be measured using the line-transect method; however, when only moderate levels of accuracy are needed, the photo-comparison method is often appropriate. By comparing photographs of known percent covers to observed areas in a field, percent cover can usually be estimated within 10 to 20 percentage points of the actual cover.

### Related publications:

*Residue Management for Soil Erosion Control*, NebGuide G81-544

*Estimating Percent Residue Cover*, NebGuide G95-1132

*Estimating Percent Residue Cover Using the Line-Transect Method*, NebGuide G93-1133

*Estimating Percent Residue Cover Using the Calculation Method*, NebGuide G95-1135

NRCS Publication NE-MP-10, *Crop Residue Estimator*

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