

Eroding Your Profits

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You have probably heard ‘dirt’ defined as ‘soil out of place’. As soil it is extremely valuable and useful, as dirt it is at best an annoyance and at worst an expensive and destructive problem. Exactly how valuable is our soil? Estimates vary, but one estimate is contained in the following quote by author John Seymour:

‘India, China and Indonesia all have to import North American grain in times of shortage. We in Europe are heavily dependent upon North American soya for the protein part of our stock rations. So the soil of the American Great Plains is probably the most important thing in this world.’ John Seymour, The Erosion of Civilizations, Killowen, New Ross, Co. Wexford, Ireland.

Most people would probably not rank the soil of the American Great Plains as the most important thing in this world, but it is very important in terms of global food production, and even more important in terms of its contribution to the economy of the country and the region. Indeed, it is difficult to over-estimate the value of soil and the consequences of its loss. Major Civilizations have literally been destroyed by soil erosion. Have you ever wondered when you see those pictures in National Geographic of ancient cities being excavated out of sand dunes, why they built a city in the sand dunes in the first place? Most likely, it wasn’t sand dunes when they built it. There are many examples, particularly in the Middle East, of major civilizations that built cities in agriculturally fertile areas. The increase in population caused the intensification of agriculture, which created practices that caused excessive soil erosion. Eventually the land was no longer able to produce food for the population and the civilization collapsed.

The bottom line is that soil erosion is a very bad thing, and that we should expend great effort to prevent it. Not only does soil erosion reduce the productivity of our soils, it reduces water quality and fills up our ditches, rivers, and lakes. Taking care of our soil is a stewardship issue, and everyone that drives by can see if we are being good stewards or not.

Preventing Erosion. In the Northern Great Plains we have two types of soil erosion – wind and water. All of our region experiences both types, but wind erosion tends to be most important on flat soils, and water erosion on soils with greater slopes. Erosion is preventable on all of our soils. Little erosion generally occurs when we have a crop in the field with 50% or more canopy cover. Most of the soil erosion occurs after harvest in the fall, and before 50% canopy closure in the spring. The most important practice we use to prevent soil erosion is crop residue management. Soil erosion is greatly reduced if 30% or more of the soil surface is covered with crop residue. Figure 1 shows that erosion

is reduced by at least 50 percent (compared to bare, fallow soil) if 30 percent of the surface is covered with residue.

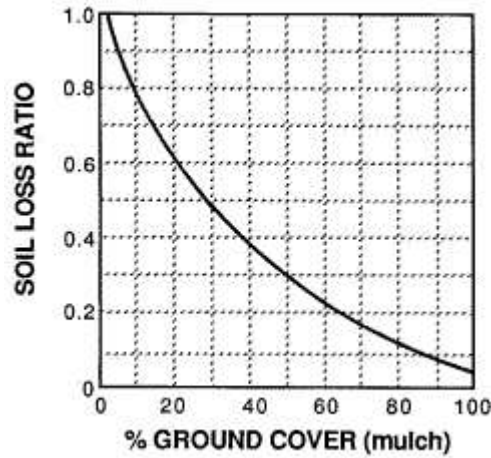


Figure 1. The effect of percent ground cover by residue (mulch) on the soil loss ratio (compared to a bare, fallow soil).

Small grains, corn, and soybeans generally give us enough residue to work with, as shown in the table below.

Percent Residue Cover After Harvest		
Corn	>100 Bu/A	<100 Bu/A
	90-95%	70-85%
	>40Bu/A	<40 Bu/A
Small Grains	85-95%	70-80%
Soybeans	65-80%	40-65%

Every tillage operation after harvest reduces the amount of residue cover remaining. Soybean residue is particularly fragile. To estimate the percentage of residue surface cover remaining after future tillage operations, calculations may be made using the data from the following table. Additional information is available on nearly every type of implement.

Implement	Percent Residue Remaining	
	Non-fragile (corn)	Fragile (soybeans)
Moldboard Plow	0-10	0-5
Paraplow	80-90	75-85
V-Ripper/Subsoiler 12-14 inches deep, 20 inch spacings	70-90	60-80
Disk Subsoiler	30-50	10-20
Chisel Plow with Sweeps	70-85	50-60
Field Cultivator Sweeps or Shovels 6-12 inches	35-75	50-70

Crops that don't leave much residue. Some of our crops leave us very little residue to work with after harvest. Sugarbeets and potatoes are of particular concern. These crops are harvested late with little opportunity to establish a fall planted cover crop. Managing soil erosion with these crops is truly a challenge. Here are a few practices to consider:

- Till fields creating large ridges that run perpendicular to prevailing winds.
- Plant shelterbelts.
- Plant in strips with high residue producing crops.
- Spread manure (where available) or residue from another crop (this works, but isn't very practical).
- If harvest is early enough, plant a small grain or other crop to establish cover.

Soil erosion is a devastating problem. It is not just a nuisance. It has serious effects wherever it is lost from and wherever it is deposited to. It is also a very visible problem-many are watching to see how we manage it. We know a great deal about managing soil erosion, and many programs are in place to provide support and funding to those who want to take advantage of them. Generations to come are depending on us to do all we can to keep our soil where it belongs.