Conservation Tillage – Soil Benefits

The primary soil quality impacts are reduced erosion, improved soil organic matter, increased infiltration, and improved soil structure (Figure 8). Leaving all or a portion of the previous crop's residue on the soil surface has three primary roles in reducing sheet and rill erosion:

1. minimizing the splash effect of rainfall,
2. reducing the potential for surface runoff, and
3. increasing infiltration.

Figure 8

Surface residue cover intercepts the falling raindrop and dissipates its erosive energy (Figure 9). Since this energy is dissipated by the residue cover, soil particles are less likely to be dislodged from soil aggregates and as a result, are much less subject to movement by water flowing across the soil surface. Surface residue can also form small dams that slow surface runoff and provide a greater opportunity to infiltrate into the soil. In addition, residue reduces the chances for soil crusting, which can significantly impact infiltration and resulting runoff amounts.

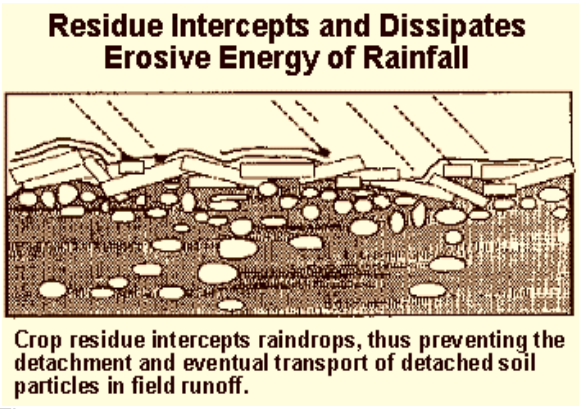

Figure 9

With no-till/strip-till systems, the amount of surface residue cover can approach 80 to 90 percent, potentially reducing sheet and rill erosion by 94 percent or more (Figure 10). After low residue crops, such as soybeans, cotton, or peas, the surface residue cover will be significantly less, perhaps no more than 30 to 40 percent cover. Less surface residue cover will generally be left after planting with ridge-till compared to no-till, because the planting operation removes the residue from the top of the ridge and places it between rows (bare in the rows, but residue cover between the rows).

Effect of Percent Residue Cover on Any Day in Reducing Sheet and Rill Erosion Compared to Conventional, Clean Tillage Without Residue

Residue Cover, % on Any Day	Erosion Reduction, % While Residue is Present
10	30
20	50
30	65
40	75
50	83
60	88
70	91
80	94

Figure 10

With mulch-till, the amount of surface residue can be significantly less than under no-till or ridge-till because full-width tillage is utilized. When high residue crops are used, mulch-till might retain 30 to 50 percent cover, but this is reduced for low residue crops. Another point