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Conservation Tillage Practices

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Department of Agronomy

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CONSERVATION TILLAGE PRACTICES

M. Rasnake

The loss of topsoil from farmlands has become a serious problem in some parts of Kentucky. During the past 20 years, grain crop acreage has tripled. The production of soybeans, which leaves the soil in a condition more susceptible to erosion, has grown from almost none to 1.7 million acres. Much of this increased acreage has come at the expense of soil conserving crops such as hay and pasture on sloping class II and III land with an erosion hazard. Use of large equipment, larger fields, chemical weed control, etc., has added to the scope of the problem with which Kentucky farmers are now confronted.

CONSERVATION WITHOUT TILLAGE

The best system for controlling soil erosion while producing grain crops on sloping land is no-tillage. A good mulch of small grain stubble, cover crops, or crop residue reduces the impact of raindrops and slows the movement of water across the soil surface. The slower moving water carries less sediment and has more time to soak into the soil. Many experiments have been conducted to evaluate the effectiveness of no-tillage in controlling soil erosion. The table below shows the results of one experiment which was done in Southern Illinois at the Dixon Springs Agricultural Center.* Similar results have been obtained from studies conducted in other states.

Tillage System	Soil Loss	
	Tons Per Acre Per Year** 5% Slope	Tons Per Acre Per Year** 9% Slope
Conventional Tillage, Wheat and Corn Doublecropped	3.04	8.42
No-Tillage, Wheat and Corn Doublecropped	0.34	0.54
No-Tillage, Continuous Corn	0.25	0.36

* L. E. Gard. Ill. Agr. Exp. Sta. DSCA 1. April 1973

** Av. of 4 years (1969-1972)

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CONSERVATION WITH TILLAGE

No-tillage will not fit every situation. Special weed problems, soil conditions, farmer preference, and other situations can rule out the use of no-till. In these cases other soil conserving practices must be used to reduce soil loss. Agronomic practices are much more preferable than engineering practices where applicable because of less cost involved in installing them.

Many farmers prefer to do their major tillage operations in the fall. Some of their reasons are: better weed and insect control; soil is in better working condition; it reduces the workload at planting time. The big problem is that fall tillage can leave the soil bare and open to soil erosion for a long period during the time that rainfall is likely to be greatest. These risks can be reduced by using a small grain cover crop following tillage. Using tillage implements such as rippers and chisel plows which break up the soil but leave much of the crop residue on the surface will also reduce risk of serious erosion. All tillage operations should be done across the slope and the soil should be left in a rough and porous condition. Smooth disking up and down the slope leaves the soil in its most erosive condition.

Delaying tillage in the spring to as near planting time as possible is also helpful. In addition, most of the practices suggested for fall tillage can be adapted for use in the spring as well.

CONCLUSION

The judicious use of good agronomic practices such as residue management, cover crops, sod waterways and conservation tillage would likely provide adequate erosion control, maintain productivity of our land, and still make it possible to produce large acreages of grain crops in Kentucky. The greatest obstacle to be overcome in use of no-tillage, particularly for corn production is an effective herbicide for johnsongrass. If chemical control methods are developed to adequately control johnsongrass in no-tillage, this would make it possible to greatly expand no-tillage with a resultant decrease in soil losses due to erosion.