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Preventing soil erosion after spring rains

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Preventing soil erosion after spring rains

Abstract
Some areas of Iowa have experienced hard, late-spring rains that have contributed to various types of soil erosion, especially fields with minimum residue coverage, where sheet and rill erosions were observed. Erosion in unprotected soil can begin as soon as the first raindrops fall. With nothing to cushion the impact, raindrops can dislodge soil particles, splashing them up to several feet away.

Keywords
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Preventing soil erosion after spring rains

Some areas of Iowa have experienced hard, late-spring rains that have contributed to various types of soil erosion, especially fields with minimum residue coverage, where sheet and rill erosions were observed. Erosion in unprotected soil can begin as soon as the first raindrops fall. With nothing to cushion the impact, raindrops can dislodge soil particles, splashing them up to several feet away. This soil splashing may seal off the soil's surface, reducing infiltration and allowing rainwater to collect and move down slopes, carrying dislodged soil particles with it. The energy and downhill movement of large amounts of water can create gullies and rill erosion. This process is also known as detachment and movement.

Ways to prevent soil erosion

There are a number of things that you can do to limit soil erosion in your operation. The amount of soil lost through detachment depends on length and steepness of slope, crop rotation, and other conservation factors such as contouring and residue cover. Terraces break up longer slope lengths and reduce slope steepness. Crop rotations with small grain or forage or with good residue cover (in row crops) help to hold soil. Planting rows on contours helps to channel small runoff streams across- rather than down-slope. Preventing erosion is to a great extent a function of management.

Maintain a high level of residue (see Take a break and measure crop residue [1] in the May 14, 2001, ICM newsletter). Crop residue cushions the impact of falling raindrops, which reduces soil detachment. Conservation tillage and no-till systems that leave residue on top of the soil also allow for better infiltration of water, reducing the amount of runoff (movement). The challenges of high residue levels include cooler soils and slow germination; however, installing row cleaners on planters can help alleviate these challenges.

Consider contour farming

Wrapping row crops around a slope instead of running them up and down the slope can prevent erosion by limiting easy pathways for runoff. Runoff often flows down wheel tracks from planting or ridges from row-crop cultivation. Contouring channels water in much flatter valleys to slow runoff. Contour farming can be difficult because of point rows and slope. It can be worth it to avoid the deep trenches in wheel tracks and rows from running rows with the slope.

Reduce slope length and steepness
Terraces work by reducing slope length and steepness to limit the energy of running water and its ability to carry soil away. Stopping or slowing the downhill flow of water and dissipating its energy allows sediment to drop out, and prevents gully and rill erosion. Also, terraces with tile line inlets can move runoff into an underground drainage system, where the water's energy is contained within the tile line. Terrace design must be in concert with the kind of soil, slope gradient, and tolerance for in-field erosion, all of which vary throughout the state. Talk with your contractor or local National Resources Conservation Service office for more specific information about maintaining the terraces on your operation. Terraces are very effective tools in slowing down the speed of runoff, and may increase tillable acreage; however, be aware that they may fill with sediment and require maintenance, and their orientation in the field may dictate fieldwork patterns.

**Use a forage or small grain in crop rotation**

If possible, use a forage or small grain in crop rotation. It allows a denser root structure that works well at shielding the soil from rainfall and runoff and holds the soil in place. Also, there are no wide channels between rows for water runoff. More closely spaced crops also can be used in contoured strip cropping to help break up slope lengths of exposed soil surface. Although forage and small grains don't fit into every farming operation, look for marketing opportunities and consider long-term economic advantages and soil conservation benefits of a more diverse operation.

**Wrap up**

Take a minute to look at what's working in your operation in terms of preventing soil erosion after spring rains--and what's not working. Now is a good time to make some notes in planning for 2002. For more assistance with conservation tools such as crop residue, contour farming, terraces, and crop rotation, contact your local soil and water conservation district office.

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