

# Tillage and Sheet Erosion

## BMPs for tillage erosion

Tillage erosion is the redistribution of soil through the action of tillage and gravity. Typically, tillage results in the progressive downslope movement of soil, causing severe soil loss on upper-slope positions and accumulation in lower-slope positions.

Tillage implements like a plow or disc throw soil either up or down slope, depending on the direction of tillage. Combine this with gravity and you get soil movement on slopes that is often greater than that from water erosion. Tillage-eroded fields can experience soil losses of 20–100 T/ha/yr (9–45 t/ac/yr). Research has shown yield declines of up to 40% in corn in these conditions.

### SOLUTION

Use **mulch tillage** or **no-till** to reduce tillage erosion. If you must till, select the tillage implement with care, reduce speed and depth, and work across the slope.



Tillage erosion has moved soil off upper- and mid-slope positions, resulting in poor crop performance.

Sheet erosion is often a stepping stone towards the more obvious rill erosion. Once detachment starts, soil is more exposed to erosion, particularly if water infiltration is poor.

## Sheet Erosion

Sheet erosion occurs where water begins to flow off the land. Sheet erosion is difficult to see because the soil is lost in a way similar to a few sheets of paper being peeled from a pad. Over time, the soil loss affects crop growth.

You have excessive sheet erosion if you see:

- soil deposited at the bottom of the slope with no apparent rills or gullies
- light-coloured knolls
- low yields on shoulder slopes and knolls.

Loamy soil types are the most vulnerable to sheet erosion, but any soil with poor water infiltration will also be vulnerable. Long gradual slopes and short steep slopes are prone to sheet erosion.

# BMPs for Sheet Erosion

On gently sloping fields – slopes up to 2% and up to 152 m (500 ft) long

## SOLUTION

**Keeping the soil covered** with conservation cropping and tillage BMPs will solve most if not all sheet erosion problems on your farm.



# BMPs for Sheet Erosion

On steeper fields – slopes steeper than 2% and longer than 152 m (500 ft)

## SOLUTION

Where slopes are longer than 152 m (500 ft) and steeper than 2% (e.g. 2 ft of rise in 100 ft length), additional BMPs may be needed. **Strip cropping** with row crops and forages or narrow-row grain may help. **Field and diversion terraces** can help with more severe landscapes. Both achieve the same goal of breaking up the slope so that cropping and tillage solutions are more effective.



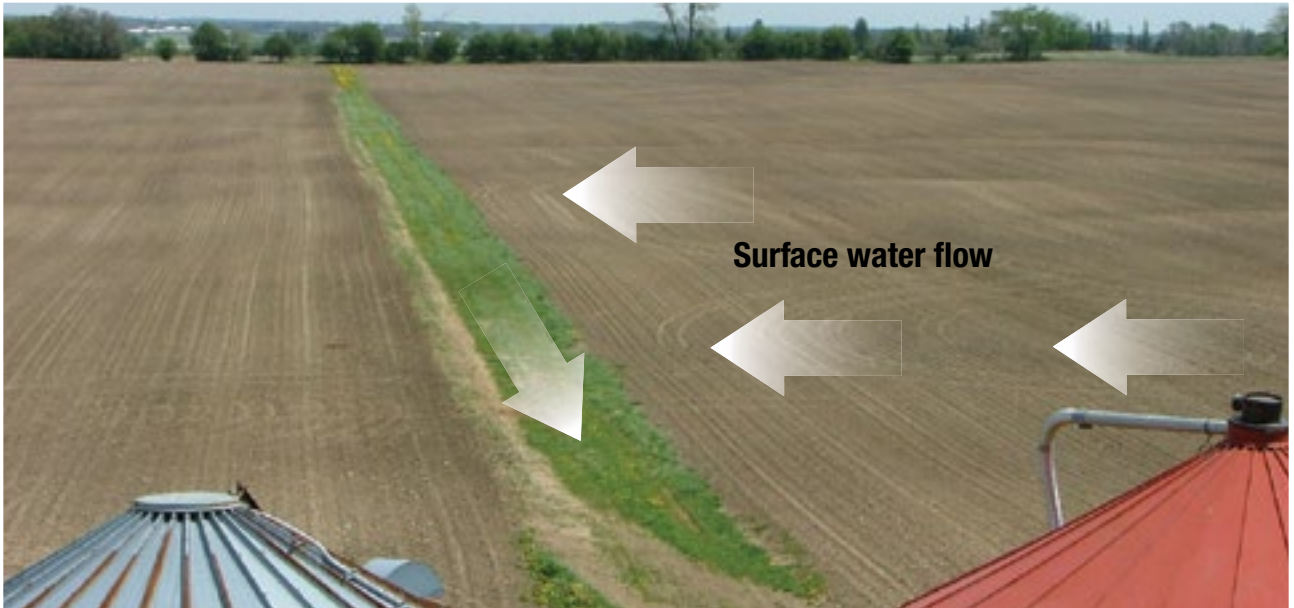
A field terrace intercepts runoff and directs it into a subsurface drainage system.



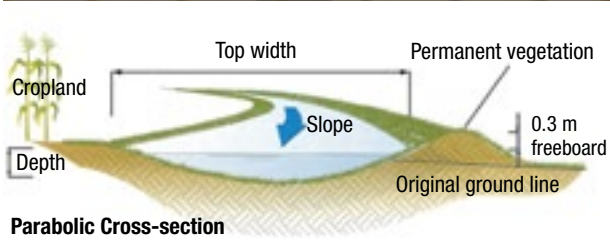
Strip cropping breaks up the slope length of a field, reducing the erosive action of water.

# BMPs for Sheet Erosion

## Diversion terraces



This diversion terrace was constructed in 1984, and still functions as designed. About 24 hectares (60 ac) of farmland drain into the diversion. A grassed waterway carries the flow safely into an open drainage channel. Slopes were 305 metres (1,000 ft) long and averaged 2% before the erosion plan was adopted.



Parabolic Cross-section

A diversion terrace acts to divert runoff overland to a safe outlet. It is typically 6 metres (20 ft) wide and has a lower cost than field terracing.

