



Our Most Valuable Asset

by Matthew Ziebari, CCA-ON

Farmland is one of our most valuable assets in agriculture, and needs to be treated with care. Farm management practices influence productivity by impacting soil properties such as texture and organic matter. The amount of soil organic matter has a significant effect on bulk density which in turn impacts water infiltration, water movement within the soil, and soil moisture retention. Surface water management practices are critical in maintaining and improving soil quality and health by increasing infiltration and preventing soil loss from erosion.

Managing soil erosion can be achieved by implementing the Universal Soil Loss Equation (USLE)

This model plays a critical role in soil and water resource conservation by predicting the long term average annual rate of erosion on a field slope based on, rainfall patterns, soil type, topography, cropping systems, and management practices. The model predicts “tolerable soil loss” rate for a particular field by comparing crop and management systems to soil loss from a specific field.

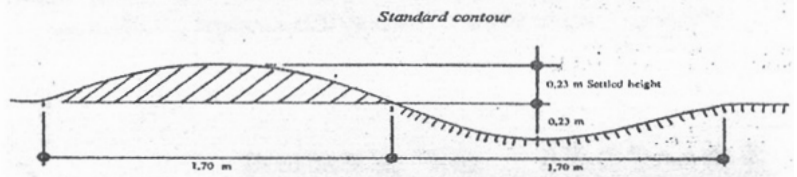
A tolerable soil loss is the maximum annual amount of soil that can be removed before the long-term natural soil productivity is adversely affected. The suggested tolerance level for most soils in Ontario is 6.7 tonnes/hectare/year (3 tons/acre/year) or less. Looking at soil loss from a different perspective by surface soil loss in millimeters(mm) and inches(in), tolerable soil loss works out to 0.45mm/hectare/year, 1.0/64 of an in/acre/year. Moderate (12.2 tonnes/hectare/year (5 tons/acre/year)) soil loss works out to 0.75mm/hectare/year, 2.3/64 of an in/acre/year, and severe (33.6tonnes/hectare/year (15 tons/acre/year) soil loss works out to 2.24mm/hectare/year, 3.6/32 of an in/acre/year. Just a slither off the soil surface.

Weather patterns are changing. The average annual temperature has been increasing in Ontario for the last 60 years and is predicted to continue. Research has shown that the growing season has been getting longer and higher temperatures could

increase the risk of drought along with extreme rainfall events that are expected to become more intensive and occur more frequently. Surface water drainage on sloped ground is at the highest risk to soil erosion if storm intensity and frequency increase as predicted. Effective management strategies need to be in place to reduce the risk. Assessing the risk can be done on the NMAN nutrient management software program. Contour drainage is a strategy used in Zimbabwe, where I farmed, to manage surface water runoff from intense rainstorms.

Contour design varies as to crops grown and soil type. Broad based contours are commonly used in grain production to allow equipment to pass over them easily and crops to be grown through them. Crops are sown at right angles to the contour. Standard type contours (Figure 1) are commonly used for tobacco and specialty crops like paprika and vegetables. Access roads are placed below the contour on every other contour. If it is necessary to cross a waterway it must be done at right angles.

Figure 1. Standard contour



The standardized contour design method rules⁴:

- Contours are laid out on a standard gradient of 1m in 250m (1ft in 250ft).
- Contour lengths are strictly adhered to as listed below:
 - a) 400m (437yds) on heavy and medium textured soils.
 - b) 300m (328yds) on light textured soil.
 - c) 250m (273yds) on light textured soils where siltation is likely to reduce their capacity.

In summary, our most valuable asset needs to be treated with care and in a sustainable way. Soil health and quality should be our priority heading into the future. Practicing sustainable agriculture will include innovative and well thought out methods to preserve and enhance our soils.

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This industry driven program helps ensure that Ontario crop producers are well served by those providing their crop production advice. This article was written by one of those CCA's.