



SOIL CONSERVATION COUNCIL OF CANADA
CONSEIL CANADIEN DE CONSERVATION DES SOLS

*The face and voice of soil conservation in Canada
Le visage et la voix de la conservation des sols au Canada*

Healthy Soil – Sustainable Future

Causes, consequences and solutions are always connected

Don Lobb, P.Ag.(Hon)

Healthy societies and healthy economies are the product of healthy soil. Healthy soil produces abundant inexpensive food in a sustainable and reliable way. This requires soil care on the part of land managers and courage on the part of policy makers who oversee soil protection.

Scientists that understand soil formation tell us that the only sustainable way to use soil is to mimic nature. Here, the prairies were covered with deep rooted grasses and moist regions were covered with forest. Plant debris and undisturbed root systems stabilized the soil and protected it from intense storms. Living organisms (biota) in the soil contribute to the plant nutrient supply. Some soil biota produce a carbon-rich sticky material called glomalin that binds organic matter from decaying vegetation and dead biota to soil minerals to form aggregates. Aggregates are the small crumbly bits of soil found in undisturbed areas, such as native prairie or a forest floor. Aggregates are nutrient-rich, resist water and wind erosion, allow water infiltration and support a healthy balance of air and moisture. They are the strongest indicators of soil health.

Cropland tillage destroys aggregates and these soil functions. Because most soil bio-activity is at or near the soil surface, even shallow or intermittent tillage is devastating, as is aggressive direct-seeding.

Progressive farmers have been able to mimic nature through the use of high levels of science, careful management and commitment. They have developed and use a practice called no-till, strip tillage or direct seeding with only a narrow strip of soil disturbed where the seed is planted. The undisturbed inter-row area retains necessary bio-activity to maintain soil health. Undisturbed roots and residue from the previous crop provide protection from erosion and moisture loss. Extended crop rotations improve soil and plant health. When cover crops are planted to provide extra soil cover and protection during the non-crop season, bio-activity and soil health improves so we can actually build and improve soil while growing agricultural crops. Never before in history has this been possible.

The benefit of soil health is clear. In 2015, a new corn yield record of 532 bushels per acre (three times normal) was set in Virginia on ground that has been no-till since 1987. We have corn and soybean yield champions in Ontario on ground that has not been tilled for more than 20 years. Intensive grazing triples beef production on the Prairies and horticulturists are capturing water with grassed inter-row ground.

Yet much cropland continues to be tilled in pursuit of short-term benefit. Habit and traditional values persist – regardless of known costs and long-term consequence. Tillage reduces soil productivity through tillage erosion, compaction, destroyed soil biota, oxidized organic matter and lost nutrient. Tillage releases CO₂ into the atmosphere, and tillage destruction of soil aggregates and plant material destabilizes soil so that in humid regions sediment and nutrient contaminate waterways and dust storms recur on the Prairies.

Soil care and protection is everyone's issue:

- **Farmers** can contribute to sustainable soil management by adopting practices that contribute to soil health. With care, they can do this without sacrificing profit.
- The **public** has a responsibility to take an interest in how farm soils are used – or abused. Everyone's food supply and the environment are at risk.
- **Politicians, policy makers** and **planners** have responsibility in the protection of good foodland soils. This is not optional. Accelerating population growth will be mirrored by food demand. Food demand and availability impact price and standard of living. That matters to everyone who eats.

We know the importance of soil care and cropland protection. We know the consequence of indifference and carelessness. What will be our legacy to future generations?

Don Lobb is a recipient of the L.B. Thomson Award, a member of the Canadian Conservation Hall of Fame and a life-long soil care advocate.

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