

Canadian Farmers: Stewards for Healthy Soils

Farmers across Canada are increasingly aware of the importance of soil health.

Soil is a key partner in their farming success. It can also be a major solution to pressing environmental concerns such as climate change.

*It all comes down to six basic principles. These are known as the **6Cs of Soil Health**.*

This Fact Sheet is one of a series that describe these basic principles for building healthy soils & provide video interviews with Canadian farmers who are putting these principles into practice.

The 1st C: Control Compaction

Soil becomes compacted when downward pressure – usually from the wheels of farm equipment -- compresses the soil's structure, reducing or eliminating pore spaces. These spaces are where water and air are held; eliminating them turns soil from a sponge-like material into something more closely resembling a brick. Since both soil organisms and plant roots need water and air to thrive, compacted soils are unhealthy and unproductive. In addition, compacted soils, impermeable to rainfall, result in increased flooding, loss of expensive inputs through run-off, and increased surface water pollution.

Here are some of the ways in which farmers are working to prevent compaction:

- **Timing.** Avoiding driving on wet soils.
- **Reduced pressure** from tires. Using larger tires and/or reducing their pressure decreases the pressure per unit area of soil.
- **Controlled traffic.** GPS-guided equipment can travel over the same ground on every pass, regardless of activity (planting, spraying, harvesting, etc.). These consistent travel pathways are called "tramlines". The areas between tramlines, where crops are grown, never get any traffic.



Soil Health Matters in Agriculture

featuring

Steve Ells
Benjamin Bridge Vineyard
Gaspereau Valley, NS

Steve Ells controls compaction in his vineyard by "deep ripping" (subsoiling) alternate rows between the vines every two years to break up existing compaction, then seeding them with mixed-species cover crops to build good soil structure that will resist new compaction caused by equipment and foot traffic.



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- **Conservation tillage.** No-till and even strip-till practices (see 2nd C Fact Sheet) reduce the number of passes that equipment must make over fields.
- **Building better soil structure.** Many of the practices described under the 6Cs principles will, if applied consistently, build better soil structure. Well structured soil, with good aggregation, resists compaction and recovers more rapidly from compaction events.

Here are some of the ways in which farmers are working to reduce or ameliorate existing compaction:

- **Biodrilling.** Also known as “biological tillage”, biodrilling involves the use of species such as forage radish to create root channels, which gradually break up compaction layers.
- **Subsoiling.** Tools such as chisel ploughs are used to break up compaction at various depths below the surface.
- **Following remediation with prevention techniques.** Neither of the above methods are permanent, so the best option is to follow each with the other 6C management practices, which when followed consistently will prevent compaction.



These two soils come from adjacent fields. The soil on the left is from a field managed to control soil compaction by following 6 Cs principles – the soil has a sponge-like structure that allows easy infiltration and storage of water from rainfall. The soil on the right has not been managed to control compaction and has a blocky, platy structure that will prevent infiltration and storage of water.

Canadian Farmers: Bringing Soil Health to Life



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