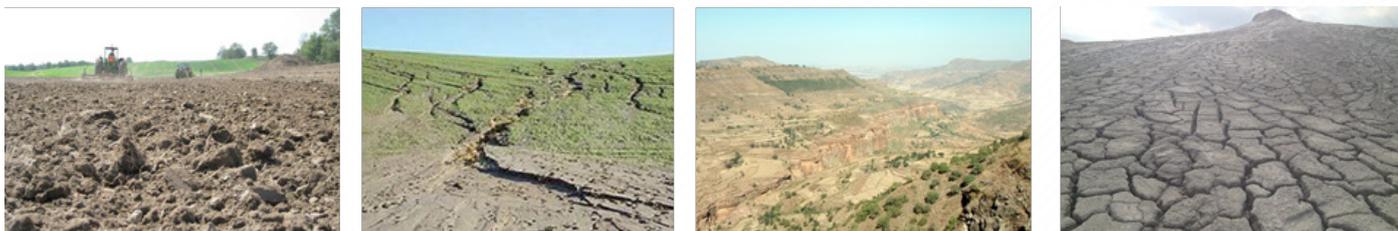


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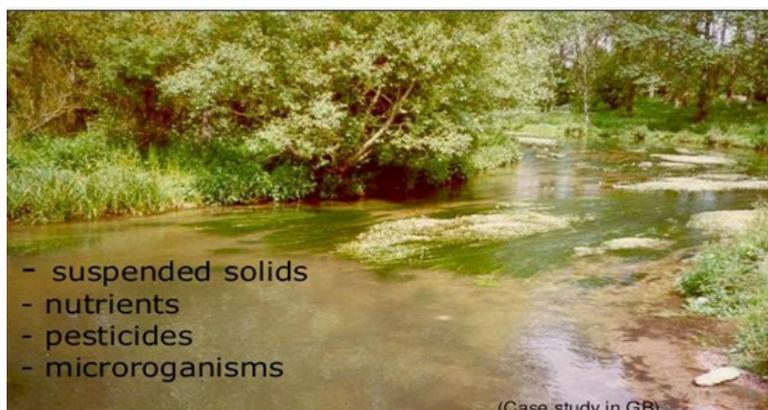
Basis of Establishing Crops the CA way

Tillage fractures the soil, disrupts soil structure, and accelerates surface runoff and soil erosion. Tillage also reduces crop residue, which would help cushion the force of pounding raindrops. Without crop residue, soil particles become dislodged, moved or 'splashed' away. Splashed particles clog soil pores, effectively sealing off the soil's surface, resulting in poor water infiltration. The United Nations reports that a third of the planet's land is severely degraded and fertile soil is being lost at the rate of 24 billion tons per year. Topsoil loss has been reported as high as 87 tons per hectare per year on sloping land. When the topsoil is lost, the land is left unable to sustain healthy crops. Ethiopia loses over 1.5 billion tons of topsoil from the highlands to erosion (Tamene & Vlek, 2008). 200,000 ha of land per annum are lost due to soil erosion associated with tillage. This indicates that soil erosion is a very serious threat to food security of people and requires urgent management intervention.



Repeated soil tillage at the same depth has been shown to cause the formation of a plough (hard) pan which restricts water infiltration and root development. This can have significant reduction in crop yields. Runoff resulting from restricted water infiltration causes increased erosion and nutrient & pesticide losses. This means compaction-tillage spiral is an environmental threat with impacts beyond the individual field.

More tillage means more power to prepare seedbed. Where fossil fuel based power is used this can result in increased emissions of the greenhouse gases carbon dioxide, methane, and nitrous oxide due to increased fuel consumption.



Because in CA, there is less soil disturbance than with conventional tillage, plant residues, fertilizers, and other soil amendments do not get mixed into the soil as much and plant roots tend to proliferate in the top few centimeters. Furthermore, this surface layer is usually wetter, cooler, less oxidative, and more acid. These conditions tend to cause the organic matter content to increase or to decrease at a slower rate compared to under conventional tillage.



Establishing crops along CA principles means: Reduced tillage, Use of cover crops or Mulch & Crop rotations.