

The Wedge from Conservation Tillage

Comments

Conversion of natural vegetation to annually tilled cropland results in the loss, on average, of one third of the soil carbon if the land was formerly forested, and of one half of the soil carbon if the land was formerly in grassland or pasture (S62, S64). Over historical time, approximately 55 Gt of carbon has been lost on the 1600 million hectares of cropland (S58, S63).

Soil carbon loss can be reversed by techniques that increase the rate of carbon input into agricultural soils or decrease the rate of carbon loss. The former include techniques to reduce the period of bare fallow and the planting of cover crops. The latter include conservation tillage practices that reduce aeration of the soil, such as no till, ridge till, or chisel plow planting (S62, S71). Experiments have shown that it is possible to reverse the loss of soil carbon on croplands with these techniques (S71- S73) and to store carbon at an average rate of 0.3-0.6 t/ha-y over a period of several decades (S62, S72-S74). The lower storage rate, if it could be continued for 50 years, would store the 25 GtC required to contribute a wedge if it were applied to all cropland.

Soil management strategies that increase soil carbon are already widely adopted. Conservation tillage alone had been adopted on 110 million hectares by 1995 (S74). The IPCC estimated that up to a wedge (up to 22-29 GtC) could be filled by management of existing agricultural soils (S63, S75).

References

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