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Retaining stover quantitatively increases stable aggregates

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Collecting surface soil for determining wet aggregate stability from soybeans in a field with little surface residue. Photo courtesy of USDA-ARS.

It is essential to balance harvesting crop residues for energy or other uses with protecting soil quality, preventing erosion, and safeguarding productivity to meet the expanding demands for food, feed, fiber, and fuel.

Harvesting stover alters the mass of residue retained, which might alter a soil's ability to form and maintain water-stable aggregates. However, evidence of the quantitative relationship between residue and aggregation is lacking.

A new article in the *Soil Science Society of America Journal* reports on work from long-term residue harvest studies that derived an empirical relationship between stover input rate and water-stable aggregates. The percentage of water-stable aggregates increased by 0.85 and 2.25% per Mg stover returned in both a chisel-plowed and a no-till field, respectively. Results indicate that returning stover on a field without tillage increased the mean weight diameter of water-stable aggregates.

Harvesting stover reduced the formation and/or the maintenance of stable aggregates, thereby reducing a soil's ability to resist the erosive force of water and thus putting the soils' quality and productivity at risk.

Dig Deeper

Ojekanmi, A., & Johnson, J.M. (2021). Quantifying improvements in water stable aggregation due to corn stover retention. *Soil Science Society of America Journal*. <https://doi.org/10.1002/saj2.20198> (in press)

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