

Fertilizers' Impact On Soil Health Compared

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In a study published in the Soil Science Society of America journal in September 2018, researchers investigated how fertilizing with manure affected soil quality, compared with inorganic fertilizer. The University of Wisconsin-Madison team evaluated two fields in South Dakota. Either manure or inorganic fertilizer were applied to field plots under corn (*Zea mays* L.)/soybean (*Glycine max* L.) rotation from 2003 to 2015. Low, medium, and high manure levels, and medium and high inorganic fertilizer levels were utilized. The researchers also had a control treatment of no soil additives to provide a comparison.

Soil samples were collected at a variety of depths in the summer of 2015. Analysis yielded the following results:

- Manure helped keep soil pH in a healthy range for crops. Inorganic fertilizer made the soil more acidic.
- Manure increased soil organic carbon for all the measured soil depths compared to inorganic fertilizer and control treatments. More organic carbon means better soil structure.
- Manure significantly increased total nitrogen in the soil compared to fertilizer treatments.
- Manure increased water-stable aggregates, which are groups of soil particles that stick to each other. Increased water-stable aggregates help soil resist erosion. Inorganic fertilizer application decreased these aggregates.
- Manure increased soil electrical conductivity at all soil depths (1.56 dS/m) in comparison to inorganic fertilizer (0.71 dS/m) and control treatments. Higher soil electrical conductivity means higher salt levels in the soil.

Data from this study concluded that the long-term annual application of manure improved selected soil properties compared to that of inorganic fertilizer.

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