Ten-Year Study Shows Manure Application Enhances Soil Organic Matter

Land application of animal waste benefits both soil and crops. It is estimated that up to 75% of nitrogen, 60% of phosphorus, and 80% of potassium fed to dairy cattle, and 50% of N, P, and sulfur from dietary intake of swine are excreted as manure and other wastes. Most states in the Great Plains rank in the top 12 in U.S. cattle and swine populations. However, research on the long-term effect of applying waste products from these animals on soil physical and chemical properties in comparison with inorganic fertilizer is scarce.

In the May-June 2015 issue of the *Soil Science Society of America Journal*, a 10-year field study in Kansas compared three levels of cattle manure, swine effluent, and inorganic fertilizer, along with a control, on soil physicochemical properties.

In general, application of cattle manure enhanced soil organic matter (OM) content and improved soil physical properties compared with other treatments, but caused excessive levels of soil test P. Significant relationships ($P<0.001$) were observed between OM and soil water content at -1.5 MPa; both Proctor max and field bulk densities; optimum water content for compaction; and steady-state infiltration rate.

Overall, the researchers conclude that cattle manure improves soil resistance to compaction, largely due to the additional OM that accumulates from long-term application of manure.


Mobilization of Phosphorus from Creek Sediments

The July–August issue of *Agronomy Journal* features a special section on “Water Security for Agriculture,” which covers the following topics:

1. Definition of water security
2. Global water resources
3. Water resources and food security
4. Blue water demand for sustainable intensification
5. Managing green water in dryland agriculture
6. Environmental impact of water use in agriculture
7. Towards achieving water security in agriculture
8. Legal constraints on conserving water in the western United States
9. Research and development principles

The papers were prepared by ASA’s Water Security for Agriculture Task Force, which also developed symposia for the AAAS 2013 Annual Meetings in Boston, MA, and the 2013 ASA, CSSA, and SSSA Annual Meeting in Tampa, FL. Visit https://dl.sciencesocieties.org/publications/aj.

Journal Special Sections

*Agronomy Journal* Features Special Section on Water Security

Schematic diagram of photosynthetically active radiation (PAR) interception measurements and the correlation coefficient between the fraction of PAR interception at different heights and grain yield during post-tasseling stages.

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