

Studies show biosolids can boost soil phosphorus levels for years

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Agronomist Eton Codling inspects wheat plants grown in biosolid-amended soils. Yields from some biosolid amendments were higher, but yields from lime-treated biosolids were severely reduced. The unhealthy plant on the left is growing in soil amended with lime-treated biosolids. Credit: Stephen Ausmus.

Treated wastewater solids called biosolids are sometimes used by farmers to boost soil nutrient levels. Now research by a U.S. Department of Agriculture (USDA) scientist provides new information about how long those plant nutrients remain after biosolids have been applied to the soil.

This work was conducted by Agricultural Research Service (ARS)

agronomist Eton Codling, and supports the USDA priority of promoting international food security. ARS is USDA's chief intramural scientific research agency.

Biosolids used in agricultural production have been processed to kill pathogens, and their use is strictly regulated to ensure that the materials don't harm the environment, human health or animal health. Farmers who follow pre- and post-application management regulations can obtain permits to apply biosolids to fields where food and feed crops are grown.

Codling measured mineral levels in three different soils that had received a single amendment from a biosolid processed either via high heat, additions of lime, [anaerobic digestion](#), or air drying. The amendments, which were applied at several different rates to the soils, had taken place from 16 to 24 years earlier during previous studies on biosolids. As part of the earlier work, the fields had been cropped after the biosolids had been added, so the biosolid nutrients in the experimental fields had been available for crop uptake for at least 16 years before Codling began his research.

Codling observed that phosphorus levels were generally higher in the biosolid-amended soils than in soils that didn't receive the amendments. This strongly indicated that soluble [phosphorus levels](#) in biosolid-amended soils could exceed typical plant requirements for years after biosolids were added.

Codling, who works at the ARS Environmental Management and [Byproduct Utilization](#) Laboratory in Beltsville, Md., also noted that phosphorus solubility varied with the biosolid type and application level.

More information: [Read more](#) about this research in the January 2013 issue of Agricultural Research magazine.

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