Science Societies

Stimulating soil biota to reduce phosphorus runoff

August 20, 2020



A close-up of a student working in an experimental plot in the field. Photo by Michael Weintraub.

When fertilizer phosphorus (P) is applied to soils, excess P can run off fields and cause harmful algal blooms. Due to its chemistry, much of the added P that is not lost in runoff binds to soil particles and becomes inaccessible to plants. Microbial and faunal decomposers can increase soil P accessibility to plants in natural systems.

A recent *Journal of Environmental Quality* article tested the hypothesis that this may also be true in agricultural systems. By adding corn stover and sodium to stimulate microbes and soil fauna, the team sought to increase P application efficiency and reduce runoff potential.

Stover addition increased microbial activity, and sodium with stover increased soil faunal activity. However, soil biological activity was low in all treatments and was not correlated with instantaneous measures of P accessibility;
cumulative P accessibility over the course of the growing season was correlated with microbial phosphatase activity and respiration.

Therefore, in fields with low levels of decomposer activity, organisms may play a limited role in soil P cycling. Treatments to stimulate decomposers already present in these types of systems may be ineffective at increasing soil P accessibility in the short term, but in the long-term, higher microbial activity may be associated with higher soil P accessibility.

Dig deeper

Susser, J.R., Pelini, S..L, & Weintraub, M.N. (2020). Can we reduce phosphorus runoff from agricultural fields by stimulating soil biota? *Journal of Environmental Quality*, *49*, 933–944. **https://doi.org/10.1002/jeq2.20104**

More science

Back to issue

Back to home

Text © . The authors. CC BY-NC-ND 4.0. Except where otherwise noted, images are subject to copyright. Any reuse without express permission from the copyright owner is prohibited.