

Beneficial Use of Drinking Water Treatment Residuals as an Agricultural P Sorbent

Use of P sorbents can be an important strategy to reduce offsite P transport, especially when targeted to “hot spots.” Targeted uses may include co-blending with manure prior to land application, edge-of-field application where surface runoff leaves a field, as a component of blind inlets or a buffer strip around a surface inlet, filter material to treat drainage water. To be effective the P sorption capacity/mechanism and the stability of the P sorption must be. Much work has been done evaluating drinking water treatment residuals (WTR) due to their amorphous Fe or Al oxide content, due to the use of Fe or Al salts as coagulants during the drinking water treatment process. Each treatment plant uses different source water and different treatment chemicals and processes, producing WTR with different chemical compositions and P sorption capacities.

The initial location for P sorption BMP development and proof of concept is Ohio. However, this concept should be applicable anywhere.

Dr. Elizabeth (Libby) Dayton is the team leader in collaboration with an Ohio State University team including Dr. Nick Basta and Shane Whitacre, School of Environment and Natural Resources and Dr. Chris Holloman, Director of OSU Statistical Consulting. Partnering with the OSU team is Kevin Elder, Executive Director of Livestock Permitting at the Ohio Department of Agriculture, Terry Mescher, Conservation Engineer, The Ohio Department of Natural Resources, and Pam Allen, Chief Division of Materials and Waste Management, Ohio EPA. The focus of the work will be establishing a General Use Permit Framework for beneficial use of WTR for OEPA. This will be an important step to streamline use of a municipal byproduct as an agricultural P sorbent.

This BMP will be most useful where there is more manure needing to be land applied than land area in need of P or where there is an elevated risk of offsite P transport such as at the edge-of-field, blind inlet or around a surface drain. Targeted uses may include co-blending with manure prior to land application, edge-of-field application where surface runoff leaves a field, as a component of blind inlets or a buffer strip around a surface inlet, filter material to treat drainage water.

Development of a General Use Permit Framework for beneficial use of WTR for OEPA, will expedite adoption and provide guidance for use as a P sorbent. With adequate guidance P sorbents could be integrated into the Ohio P Risk Index, which would provide a powerful management option for farmers who may be struggling with high P transport risk.

This project is supported by an Ohio EPA Special Assistance Grant one objective of which is co-blending of WTR with manure prior to land application.

Once guidance for use of WTR as a P sorbent is established its use can be promoted through OSU extension, various livestock groups that may benefit from it and by its integration into the Ohio P Risk Index and therefore nutrient management plans.