Compost filter socks improve runoff from croplands

EurekAlert

MADISON, WI, June 21st, 2010 Water runoff from cropped farm fields can contain large amounts of eroded soil as well as some of the fertilizer and herbicide. Expanding on existing conservation practices, a team of scientists has tested whether compost filters socks in grassed waterways would reduce sediment flow and retain dissolved chemicals in runoff. The researchers observed reduced sediment in a non-tilled field and reduced concentrations of two herbicides.

Compost filter socks are mesh tubes filled with composted bark and wood chips. These devices have been approved by the U.S. Environmental Protection Agency for use at construction sites as an alternative to silt fences and bales of straw, but have not been tested in agricultural fields.

The two year field study was conducted by USDA-ARS soil scientists Martin Shipitalo and Lloyd Owens, along with hydraulic engineer Jim Bonta and Ohio State University collaborator Libby Dayton. They found that filter socks reduced sediment concentration by 49% in runoff from the tilled field, but had no effect for the no-till field, where sediment concentrations were already 1/5 of that from the tilled field. The filter socks also reduced the concentrations of the herbicide alachlor by 18% and the herbicide glyphosate (Roundup) by 5% in runoff from the tilled field. The filter socks had a negligible effect on nutrient concentrations in the runoff.

Their report was published in the May-June 2010 issue of the *Journal of Environmental Quality*, published by the American Society of Agronomy, the Crop Science Society of America, and the Soil Science Society of America. It was conducted at the USDA-ARS's North Appalachian Experimental Watershed near Coshocton, OH.

Conservation tillage practices, sometimes referred to as "no-till," leave some of the residue from the previous crop on the soil surface, help reduce the amount of sediment lost in runoff, but do little to reduce the concentrations of surface-applied nutrients and herbicides that can be readily dissolved and transported in runoff.

Similarly, conservation buffers, such as filter strips, riparian forest buffers, and grassed waterways, can further reduce chemical and nutrient transport as runoff moves from crop fields to streams. They are also generally more effective in retaining sediment than dissolved chemicals and work best when runoff is uniformly distributed across the entire area of the buffer.

Unfortunately, uniform distribution is often difficult to achieve and maintain due to soil and topographic conditions. Runoff can naturally concentrate in small areas as it passes through buffers. In fact, the USDA-NRCS has referred to concentrated flow

as the 'nemesis' of pesticide trapping in conservation buffers.

This study demonstrates that filter socks can enhance the effectiveness of grassed waterways in reducing sediment transport. Investigations in which materials will be mixed with the compost to improve the removal of nutrients and herbicides are being conducted in collaboration with filter sock manufacturer Filtrexx International, LLC. If these results are promising, filter socks may become another tool that can be used by farmers and conservationists to reduce the impact of crop production on surface water quality.

SOURCE [1]

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