



Gen2-2011 - Reducing Soil Erosion in Areas of Concentrated Flow

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Reducing Soil Erosion in Areas of Concentrated Flow

Purpose:

In Ontario snow melt and early spring rains have demonstrated the potential to contribute significantly towards total annual erosion and phosphorous runoff. Often soil movement is greatest in areas where water flow is concentrated. Hence the reason for promoting permanently grassed waterways. Grassed waterways are often viewed as being troublesome in terms of most field operations and maintenance of the waterway itself. In attempts to reduce erosion risks, this project will investigate the use of compost-filled filter socks for their ability to slow and filter surface water in zones of concentrated flow within annual crop fields during the erosion susceptible non-crop growing months (ie. spring runoff). In conjunction with erosion control, we will also assess the practicality of using compost-filled filter socks for erosion protection based on their ease of transport to and within fields, ease of effective positioning within erosion sensitive zones, ability to filter or slow surface water, and ease of removal or reuse if possible.

Methods:

Filter socks consisting of 12-18" diameter mesh filled with bark compost were sourced from Filtrexx Canada Inc. (Brantford, Ontario). Filter socks were set up in seven field sites across Southern Ontario during the fall of 2011. Socks were transported to field sites on skids by pickup truck bed or trailer and were cut to size and moved to erosion sensitive areas within the fields by a Kubota RTV-900. Socks were positioned to trap and filter and/or deflect water, primarily in areas of expected concentrated flow where erosion has been observed to be an issue, and were secured by hammering wooden stakes on angles into the ground. Different methods of positioning the socks were made in order to investigate the impact of filter sock placement on erosion control efficacy.



Figure 1. Filter socks in position. RTV used for transport in background.

Results:

When received by skid, socks can be maneuvered easily. Skids served well for temporary storage before deployment as well as for transportation from storage to field sites by pickup truck or trailer. Once at field sites 12" diameter socks can be maneuvered by two people, although 18" were much more difficult. Socks are easily cut to desired length, and both sizes were easily transported across fields by ATV. Towing through fields with standard sock mesh did show evidence of ripping small holes suggesting sock integrity could play an important role in durability and reuse.

While limited, preliminary observations following a heavy fall rain suggest blocking/pooling of water occurs at zones of concentrated flow, although improper setup (insufficient length, positioning, or leveling on ground) has also demonstrated the ability of water to flow below/around socks.



Figure 2. Filter sock accumulating water across a zone of concentrated flow during a rain in December, 2011

Summary:

Filter socks currently tested have been readily handled to and within field sites with appropriate equipment (skid loader, pickup truck/trailer, ATV, two people). Preliminary results suggest sock positioning is critical to erosion control function, though further observations will be required.

Next Steps:

Filter socks will be monitored over the winter, primarily during snow thaws and heavy spring rain events for their interaction with water flow in regions of concentrated flow. Differences in erosion control effectiveness by sock positioning, and ease of disposal will be investigated in the spring.

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