



Beneficial Management Practices

for cropping near watercourses and wetlands

BMP: On fields with significant overland flow, improve the function of vegetated filter strips by increasing the width

What are vegetated filter strips?

Watercourse buffers and grassed headlands are common sites in PEI fields. Both are examples of vegetated filter strips (VFS). VFSs are a simple, effective measure to greatly reduce the amount of soil, nutrients and other particles leaving upland areas and impacting downstream ecosystems.

Excess sediment into watercourses degrades fish spawning habitat. Excess nutrient flow into waterways can increase biological activity, decreasing available dissolved oxygen. Other contaminants adsorbed to soil particles can be carried with runoff into watercourses.



Figure 1. An excellent example of a permanent grassed headland in a potato field.

Figure 2. In-field vegetated filter strips can be very effective in trapping sediment and reducing the amount of soil leaving the field. However, areas with concentrated flow should be treated with grassed waterways.





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How vegetated filter strips work

A vegetated filter strip consists of three main elements that play a part in how it functions:

- Surface vegetation – may range from grasses to a permanent riparian vegetation of trees, woody shrubs and under-story vegetation.
- Root zone horizon
- Shallow subsoil

As surface flow is intercepted by the vegetation of the filter strip, it slows down and infiltrates into the soil. Some infiltration will occur deeper into the subsoil, while the rest will move through the upper soil profile as interflow. The extensive root system of the vegetation promotes higher infiltration rates because the plant roots improve the surrounding soil structure and create macropores for the runoff to move through. As the infiltration increases, sediment carried by the runoff is deposited in the grassed strip. This infiltration and storage in the root zone/shallow subsoil is the most important mechanism by which vegetated filter strips trap compounds that may exist in the surface runoff (contaminants, nutrients & soil particles).

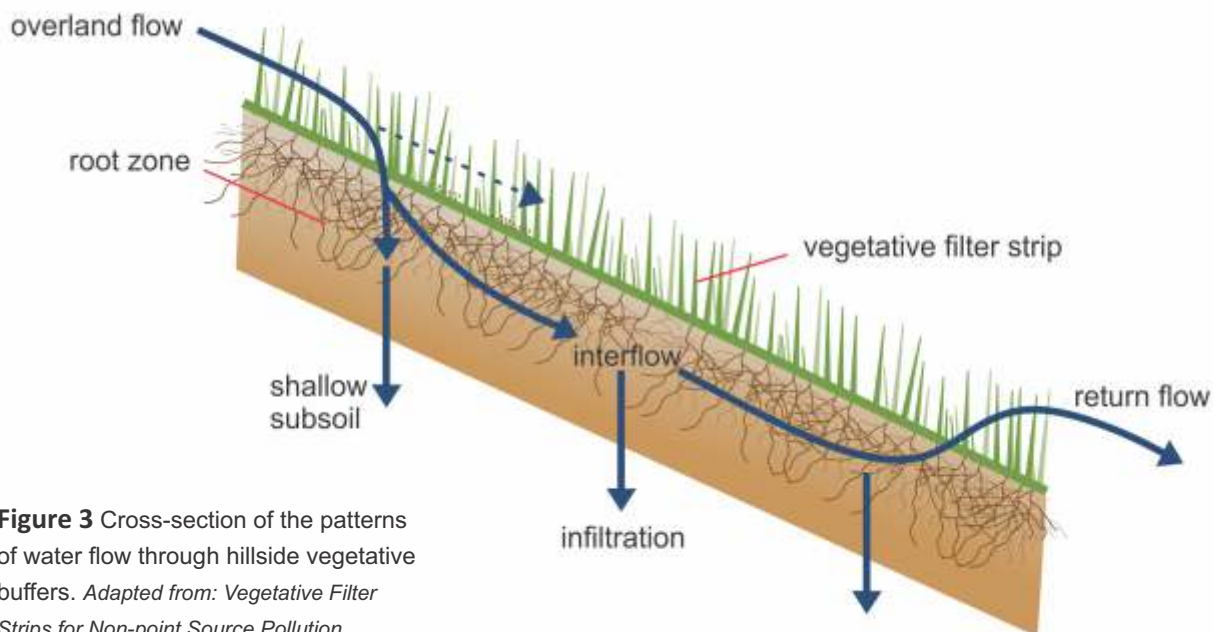


Figure 3 Cross-section of the patterns of water flow through hillside vegetative buffers. Adapted from: *Vegetative Filter Strips for Non-point Source Pollution Control in Agriculture* Publication, 8195 University of California Dept. of Agriculture and Natural Resources (2006)



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How vegetated filter strips work

These compounds may remain trapped, degrade into breakdown products, or be metabolized by plants or microbes in the buffer zone.

When the shallow subsurface becomes saturated and flow exceeds infiltration capacity, some overland flow will continue through the vegetated filter strip, however the amount of sediment and other materials will be greatly reduced.

In-field vegetated filter strips

Vegetated filter strips placed in the upland portion of a field can reduce the sediment load reporting to the end of the field and beyond, by increasing infiltration and trapping sediment in runoff.

Fields exhibiting significant rill and gully erosion on the upper slopes will benefit from a combined approach involving other soil conserving strategies working with the filter strip. Filter strips are not effective in reducing sediment loss or reducing runoff velocities in areas of concentrated flow, these must be addressed with other soil conservation measures like grassed waterways.

Vegetated filter strips - why wider is better

The period of contact between the runoff and the soil surface in the filter strip increases as the width of the filter strip increases. Longer contact means increased infiltration and a better performing filter strip/buffer.



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Benefits of vegetated filter strips

- #1. Intercepting and trapping sediment from surface water runoff
- #2. Capturing nutrients in runoff through plant uptake and/or microbial activity
- #3. Trapping soil-adsorbed contaminants

Wetland and watercourse buffers and legislated grassed headlands

On Prince Edward Island, a 15m vegetated buffer adjacent to designated watercourses or wetlands is required by legislation. For fields where regulated crops are grown within 200 metres of a designated watercourse or wetland, the rows must terminate at the edge of the buffer **or** at a minimum of 10 metres of perennial grass, planted the season before the regulated crops are planted. Many growers find it beneficial to establish permanent grass headlands in fields where they are required. This strategy allows time for a good stand of grass to develop that can withstand the pressure of frequent vehicle traffic. Having a permanently established grass headlands also ensures compliance with regulations.

Information Sources

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