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MASTEP Technology Review

Technology Name: Vegetated Filter Strips – Phosphorus Removal

Studies Reviewed: Phosphorus Removal in Vegetated Filter Strips. Majed Abu-Zreig,, Ramesh P. Rudra, Hugh R. Whiteley, Manon N. Lalonde and Narinder K. Kaushik, Journal of Environmental Quality, 2003.

Date: May 21, 2010

Reviewers: Jerry Schoen

Rating: 2

Brief rationale for rating:

This study, conducted in the field using simulated rainfall/runoff, was generally well conducted. Quality control data is lacking. Summary removal efficiencies were reported; data for each test run was not provided. There was no discussion of particle size in the report.

Comments

- Simulated runoff flowed through vegetated filter strips of varying lengths and vegetation types.
- 20 storm simulations were run, approximately 10 samples collected per run.
- Premixed sediment at 2700 mg/l and 2.37 mg/l phosphorus was used.
- 3 different flow rates were tested: 1.0, 0.65 and 0.3 liters/second. For all filter lengths and types combined, TP removal efficiencies increased from 53% at 1.0 l/s, to 54% at 0.65l/s, to 78% at 0.3 l/s. Only the last (0.3l/s) flow was considered to produce significantly better performance.
- Phosphorus removal efficiency ranged from 32% to 79% for strips ranging from 2 to 15 meters in length.
- Comparison of vegetation types, conducted with 5 meter filter strips, yielded removal efficiencies of 38% for bare soil, 65% for Ryegrass, 54% for Legume & Creeping Red Fescue, and 68% for native soils.
- Followup tests conducted 5 months later on the legume & fescue strip showed no significant difference in removal efficiency.