

Battu Krishna Rao¹
Prasanta K. Mishra²
Ravi S. Kurothe¹
Vinod C. Pande¹
Gopal Kumar¹

¹Central Soil and Water Conservation
Research and Training Institute,
Research Centre, Indian Council of
Agricultural Research, Vasad, Anand,
Gujarat, India

²Central Soil and Water Conservation
Research and Training Institute,
Indian Council of Agricultural
Research, Dehradun, Uttarakhand,
India

Research Article

Effectiveness of *Dichanthium annulatum* in Watercourses for Reducing Sediment Delivery from Agricultural Watersheds

A field experiment was conducted to determine the efficacy of *Dichanthium annulatum* grass filters in watercourses and to optimize the grass coverage in these watercourses. This experiment was conducted in 2% slope watercourses with varying filter grass coverage (0, 25, 50, 75, 100%) as main treatments and different flow rates (5, 10, 15, 20 L/s) as sub-treatments. The inflow and outflow, flow velocity, depth of the flow, and sediment concentration was measured and analyzed for each run. The experimental results reveal that the grass filter strips are able to reduce the sediment concentration in the runoff water by six times (from 4.2 to 0.65 g/L). The filter strips are able to reduce the velocity of the runoff water by two times (from 1.06 to 0.47 m/s) and convert the supercritical flows into subcritical flows. The filter strips are able to increase the Manning's coefficient from 0.0323 to 0.1006 under various discharges. From the experiment, it can be concluded that more than 50% grass filter coverage in watercourses did not further reduce sediment concentration, outflow, flow velocity, and the Froude number and increase roughness of the channels. Based on these results, it is recommended that *D. annulatum* can be used as a filter in watercourses to prevent runoff and soil losses from crop fields and thereby reducing the sedimentation of downstream water bodies. The optimum grass coverage, i.e. 50% of the channel length, can maintain the maximum grass production with minimum soil loss.