

INFLUENCE OF ROADSIDE ESTABLISHMENT PRACTICES ON SEDIMENT AND NUTRIENT LOSS¹

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Abstract: Sediment and nutrient loss due to runoff following revegetation of disturbed roadsides can negatively impact water quality. The objective of this study was to evaluate the influence of various nitrogen (N) and phosphorus (P) sources and rates, and fertilization timing on vegetative coverage and sediment and nutrient losses during roadside vegetation establishment. The study was conducted on the Highway 25 bypass in Starkville, MS. Stainless steel frames (0.75 x 2.0 m) were dug into the soil, arranged as a randomized complete block with eight treatments and four replicates. Seeding within the frames occurred on 14 July 2011. Bahiagrass (*Paspalum notatum* Flugge), tall fescue (*Festuca arundinacea* Shreb), and sericea lespedeza [*Lespedeza cuneata* (Dum. Cours.) G. Don] were seeded at 28.1 kg seed ha⁻¹. Common bermudagrass [*Cynodon dactylon* (L.) Pers.] was seeded at a rate of 22.5 kg seed ha⁻¹. Fertilizers used were 13-13-13 (MDOT standard), poultry litter, ammonium nitrate, stabilized urea, polymer coated urea, diammonium phosphate, and triple super phosphate. A total of 73.5 or 147 kg N and P₂O₅ ha⁻¹ were applied to all treatments except the untreated control after seeding. Rainfall simulations (30 minute duration, 66 mm hr⁻¹ intensity) were conducted 14, 28, and 56 days after seeding (DAS). Runoff from natural rainfall was collected in plastic containers. All runoff samples were analyzed for total sediment (TS), dissolved reactive P (DRP), total P (TP), NH₄-N, NO₃-N, and total N (TN). Results suggest that runoff volume decreases as vegetative cover increases. However, neither P source, nor P rate, nor N source, nor N rate had an influence on vegetative coverage. Differences in DRP occurred between P sources across all runoff events. Thus, P pollution may be limited by using fertilizers other than 13-13-13 during establishment. This would decrease the potential for surface water eutrophication near newly established roadsides.

Additional Key Words: fertilizer, nitrogen, phosphorus, rainfall, runoff

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