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Pasture Management Effects on Nonpoint Source Pollution of Midwestern Watersheds

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Abstract Text:

Without proper management, cattle grazing may cause sediment and phosphorus loading of pasture streams by bank erosion and manure deposition. Practices that alter the timing, frequency, duration, or intensity of cattle grazing may reduce nonpoint source pollution of pasture streams. A project has been initiated to: 1) Quantify the effects of pasture management on sediment and phosphorus loading of streams; and 2) Evaluate the effects of pasture characteristics, grazing management, and microclimatic conditions on the temporal and spatial distribution of grazing cattle in two Iowa watersheds. Sediment and phosphorus loss, bare and manure-covered ground, and vegetation sward height and species are being measured along the banks of streams in thirteen pastures on beef cow-calf farms in the Rathbun Lake watershed in southern Iowa and in six pastures grazed by continuous stocking with full stream access; continuous stocking with stream access at stabilized crossings; or rotational stocking in the Willow Creek watershed near Rhodes, Iowa. These measurements are being compared to the annual and seasonal grazing intensity, pasture shade distribution, presence of off-stream water, stream stage height, and microclimatic data. Temporal and spatial distribution of grazing cattle are being recorded for two weeks with GPS collars on 2 or 3 cows in late spring, mid-summer, and early fall on five beef cow-calf farms in the Rathbun Lake watershed and 1 cow from May through September in the six pastures grazed in the Willow Creek watershed. Cattle distribution is being compared to the pasture species, pasture shade distribution, presence of off-stream water, and microclimatic data. Initial results reveal that restricting stream access to stabilized crossings, rotational stocking or providing off-stream water reduce the time that cattle are in pasture streams and reduce the proportion of bare ground late in the grazing season, but pasture management had little effect on stream bank erosion.

Impact Statement:

Previous studies have implied that stream bank erosion and manure deposition in pastures contribute to sediment and phosphorus loading of Iowa streams and lakes. These problems likely result from pasture or grazing management practices that promote frequent congregation of cattle near pasture streams. The results of this project will determine the efficacy of management practices that alter cattle distribution near streams on sediment and phosphorus loading. The information obtained will be used as the basis for extension publications addressing management of riparian grazing and a WEB-based course on Livestock and the Environment.