Loss of Phosphorus by Runoff for agricultural Watersheds: Wagon Train Watershed, Lancaster County, Nebraska. (3495)

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Abstract:

NRCS scientists developed a cost-effective technique utilizing the soil survey database to estimate the environmental impact of agricultural watersheds on natural water resources. The objectives of this study were to apply this technique on Wagon Train (WT) watershed to predict: i) loss of water by surface runoff, ii) loss of phosphorus (P) from soils by runoff, and iii) P loading for WT reservoir, and iv) to validate the technique. The annual loss of water by runoff was estimated at 4.32 million m3. USGS data for a 50-year period (1951-2000) indicated that the average annual inflow for WT reservoir was 4.25 million m3. The predicted annual P loss by runoff was 846 kg and could be considered as the annual loading for WT reservoir. The estimated average P concentration in the runoff water was 196 µg/L. The average P concentration in water samples taken from five locations in the reservoir was 140 µg/L. The concentration of P in water samples collected from 12 major streams ranged between 99 and 240 µg/L with an average of 162 µg/L. Phosphorus uptake by weeds and aquatic plants in the streams and reservoir might explain the slight drop of P concentration in waters. Also, the high pH (≈ 8.5) measured in water from the streams and reservoir compared to soils (≈ 6.0) might explain this drop in P concentration. We concluded that the NRCS technique could be applied to predict the impact of P loss from an agricultural watershed on surface waters.

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