Applying knowledge to improve water quality
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Phosphorus Indexes in Four Midwestern States: A Literature Review and Comparison

Abstract:
Phosphorus indexes (PIs) have been developed by most states to assess the potential for P loss from agricultural land to surface waters, to plan and regulate manure P application, and for education. We compared PIs of four states through application to a series of contrasting field scenarios for variations in soil test P (STP), P application, distance to surface water or concentrated flow, and erosion rates. The effect of increasing STP from 30 to 90 mg kg^{-1} (ppm) caused changes in runoff P risk assessment scores of 0% to 300%. Risk assessment scores were increased from 0 to 64% for surface application as compared to injection of manure, and from 0 to 32% for winter as compared to spring manure application. Increasing the distance from point of application to the edge of a water body from 15 to 30 m (50 to 100 ft) resulted in decreases in PI scores of 0 to 29%, and increasing erosion loss of soil from 2.3 to 11.3 Mg ha^{-1} (1 to 5 t/A) increased scores by 30 to 244%. While factor estimates in some PIs are better supported by research findings than others, more validation and possibly calibration of each state's PI is needed.

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