

RUNOFF AND PHOSPHORUS ISSUES RELATED TO WINTER APPLICATIONS OF MANURE

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Abstract

Application of manure during winter on frozen soil and/or snow is an issue of major concern to Wisconsin agriculture since soils are typically frozen and/or snow-covered for 100 to 140 days each winter and only about 20% of Wisconsin livestock farmers have manure storage. Typically manure applications improve soil physical conditions and reduce runoff volume; however, the quality of runoff water from where winter applications have been made may be substantially impaired. Phosphorus loading of runoff water from winter-spread manure is influenced by several site-specific factors, including application rate, slope gradient and length, time between manure application and first runoff event, fate of initial meltwater, position of manure in the snow pack, soil surface roughness and vegetative cover, and presence of buffer zones. Measurements of winter-spread manure P in runoff water range from negligible traces to 25%. High risk areas for winter applications appear to be steep, long slopes with smooth soil surfaces and significant amounts of residue present to keep the manure from interacting with the soil. Particularly vulnerable times of application include at the base of the snow pack or during active melt periods. Applications in areas where runoff concentrates should be avoided.

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