

Illinois Nitrogen Assessment Tool

Nitrates in surface and ground water continue to be a concern in Illinois. There are numerous sources of nitrates in the waters of the State. Agriculture is a leading source due as it is a dominant land use in Illinois. Corn and soybeans are the dominant crops grown on Illinois farms.

Vulnerability of ground and surface water refers to inherent field features that govern the relative risk to nitrate contamination. For ground water, there are two basic physical elements to consider: depth to aquifer materials and permeability of the overlying strata. Overlying strata will vary in permeability but there are no natural strata that are completely impermeable therefore, the depth to aquifer materials is the most dominant factor. Runoff accounts for a very small portion of the nitrate-nitrogen in Illinois surface waters. Tile drainage is the leading transport pathway of nitrates into surface waters in Illinois.

Two maps are provided to assist nutrient management planners in assessing the vulnerability of ground and surface water to nitrate-nitrogen. The table below is to be used as a guide in the development nutrient management plans.

Nitrate loss potentials based on soil texture, timing, and nitrification inhibitors for corn.			
Timing/method	Soil Texture ²		
	Coarse	Medium	Fine
Fall > 50°F ¹	High	High	High
Fall < 50°F plus inhibitor	High	Medium	Medium
Spring ⁴	High	Medium	Medium
Spring plus inhibitor	Medium	Medium	Medium
Spring plus side dress	Medium	Medium	Medium
Spring applied controlled release nitrogen fertilizer	Medium	Medium	Medium
The addition of a fall seeded, overwintering cover crop will lower the above loss potentials by one class. Example: High to Medium			
Nitrate loss potentials based on soil texture, timing, and nitrification inhibitors for late spring planted summer annuals.			
Timing/method	Soil Texture ²		
	Coarse	Medium	Fine
Fall	High	High	High
Spring	High	Medium	Medium
Spring plus inhibitor, Spring split applications, and Spring applied controlled release nitrogen fertilizer	Medium	Low	Low

Nitrate loss potentials based on soil texture, timing, and nitrification inhibitors for cool season fall seeded, small grains

Timing/method	Soil Texture ²		
	Coarse	Medium	Fine
Fall > 50 lbs. N/ac.	High	High	High
Fall <51 lbs. N/ac followed by spring applied at green up	Medium	Low	Low
Fall 30 lbs. N followed by spring green up followed by jointing	Low	Low	Low
Fall 30 lbs. followed by controlled release nitrogen fertilizer at spring green up	Low		Low

1. Soil temperature measures at a depth of 4 inches, 10 am, bare soil
<http://www.isws.illinois.edu/warm/soiltemp.asp>
2. Coarse-sand, loamy sand, sandy loam Medium-silt, silt loam, loam Fine-silty clay loam, silty clay, clay, clay loam, sandy clay
3. The loss potential ratings are predicted on optimum or less nitrogen rates being applied.
4. Spring application no more than 30 days prior to average planting date.

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