Illinois NRCS
Nitrogen Management Guidelines

Nitrate in surface and ground waters continue to be a concern in Illinois. There are numerous sources of nitrates in the waters of the State. Agriculture is a leading source because it is a dominant land use in Illinois.

Vulnerability of surface and ground water refers to inherent field features that govern the relative risk to nitrate contamination.

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.

For ground water, results of years of groundwater monitoring indicate that the depth to aquifer materials is the most important factor predicting aquifer risk for contamination from nitrates. Statewide maps are available from ISGS that estimate the depth to uppermost aquifer but are not reliable for site-specific prediction. Other detailed maps that predict aquifer depth at a field scale are not currently available. As an alternative, a list of soil series that have characteristics for downward movement of nitrates through the soil profile has been developed. The list includes soils that are irrigated and non-irrigated with a sandy surface and subsurface, soils having low available water holding capacity in the upper 40 inches, coarse-silty and coarse-loamy soils found along stream valleys and on the bluffs of larger streams, and soils that have karst features.

The table below is to be used for recommending nitrogen applications under high risk situations:

Nitrate loss potentials based on timing and nitrification inhibitors for corn.		
Timing/method of fertilizer or manure application	**Soils with High Risk N-Leaching Characteristics[1]**	**Tile-Drained Fields[2]**
Fall > 50°F[3]	High	High
Fall ≤ 50 °F[3] without an inhibitor[4] and at half of the expected MRTN rate not to exceed 120 lbs N/acre	Medium	Medium if implementing Drainage Water Management (554), Constructed Wetland, or Cover Crop (340)
Manure fall applied that provides the full nitrogen rate with a cover crop or inhibitor prior to corn or other crops	Medium	Medium
Manure fall applied that provides only the crop phosphorus removal rate prior to corn or other crops	Medium	Medium
Fall ≤ 50°F plus inhibitor	Medium	Medium
Spring[5]	Medium	Medium
Spring[5] plus side dress	Low	Low
Spring[5] applied controlled release nitrogen fertilizer	Medium	Medium
Adding a minimum of 2 years of hay or other perennial crops to the rotation.	Low	Low
Fall seeded, overwintering cover crops.	Low	Low
Irrigated cropland preplant plus sidedress or fertigation[6].	Low	Medium

Nitrate loss potentials based on timing and nitrification inhibitors for late spring planted summer annuals.		
Timing/method	**Soils with High Risk N-Leaching Characteristics[1]**	**Tile-Drained Fields[2]**
Fall	High	High
Spring applied < 30 days prior to planting	Medium	Medium
Spring plus inhibitor, Spring split applications, and Spring applied controlled release nitrogen fertilizer	Low	Medium

1. Refer to the excel spreadsheet titled "High Risk N Leaching Soils" that contains a list of soil series and karst soils, by county, that pose a high risk for downward nitrogen movement.
2. Applies to fields where 50% or more of the field acreage is tile drained. The drained area shall be defined by the lateral spacing recommendations specified in the Illinois Drainage Guide based on predominant soil type. The outer boundary of the drained area shall be a distance of ½ the recommended lateral spacing away from the tile line(s).
3. Soil temperature measures at a depth of 4 inches, 10 am, bare soil (F^o). http://www.isws.illinois.edu/warm/soiltemp.asp
4. Nitrification Inhibitor
5. Spring application no more than 30 days prior to average planting date.
6. Irrigation Water Management (449) is also applied.

REFERENCES

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