

Corn nitrogen observations 2021

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In the past, late season nitrogen (N) application to corn was not considered feasible but with currently available application equipment it can be done. Advances in equipment have made it more feasible to apply N later in the season and the recent onslaught of rain across much of the state has led to some observations of pale or yellow corn and questions about potential N needs. *For most areas of New York (NY) producers should rest assured that if they applied N to recommended levels there should be little concern of N deficiencies despite the recent stress of excess rainfall.*

It is important to recognize that weather patterns in May and June varied widely across the state, so discussion on the significant rain in the first few weeks of July needs to be put in context of what preceded it.

May and June

Areas with average to low rainfall

Much of the northern part of the state experienced below normal rainfall with some areas of central NY closer to average. Nitrogen mineralization requires adequate soil moisture. For much of the state there was little risk of early season leaching losses, in fact in dry areas it is likely that N conversion rates were below normal, suggesting there could be extra potentially available N left in the soil as we enter the latter part of the growing season.

Areas with excess rainfall

Certain areas in the southern, particularly in the southeastern, parts of the state experienced excess rainfall. It is possible in these areas that excessive early season rainfall could have resulted in considerable N loss to leaching and or denitrification but the form of N applied will have an impact on the potential magnitude of loss with more available forms on N (nitrate containing fertilizer) being more susceptible to loss compared to the slower release organic N forms found in manure and organic matter.

July rainfall and corn response

Most areas of NY received rainfall totals in the first half of July that equaled or noticeably surpassed typical monthly totals which led to temporary conditions of saturated soils in some fields.

In the short-term these saturated conditions have created a scenario where nutrient uptake by the plant can be inhibited altogether which is leading to some of the discolored corn many are observing. In more extreme scenarios some N losses are likely due to leaching or denitrification. While leaching may have moved some nitrate lower into the soil profile, the lack nitrate-N in dry fields combined with the corn's stage of growth, depth of root system at this point of the season, and saturated conditions make actual losses from leaching less likely. Denitrification could be a greater risk but where fields have already returned to unsaturated conditions the amount lost with denitrification will be small.

In the longer-term, this recent moisture combined with warm temperatures will increase mineralization releasing additional N to the crop. How much N available for release will be dependent on considerations covered above with potentially substantial amounts of mineralizable N still available in areas with average to below average early season rainfall.

In areas that experienced excessive early season rainfall, there is a slightly greater likelihood that N losses could leave the crop slightly short on N but there are still a number of variables to consider (**Table 1**).

TABLE 1
Chance of loss and corn response to additional nitrogen based on field variables

Variables	Chance of loss and corn response to additional nitrogen	
	Moderate	Low
Rainfall	Excessive	Average to Below Average
Form of Nitrogen	Inorganic Fertilizer	Manure
Timing of Application	100% Pre-Plant Fertilizer	Manure, Sidedress fertilizer
Soil Health	Poor	Good
Previous Crop	Corn	Soybeans, Sod

It is unlikely that recent observations of discolored corn are an indication of true N deficiency. In a scenario where all variables point to the moderate potential of a response the use of test strips is highly advisable to facilitate post-harvest evaluation of a response. If sidedressing is done, leave a strip without N or with a lower N rate to check if the extra N was really needed.

See also [*Too Late to Sidedress Nitrogen? – Summary of four years of data*](#) by S. Sunoj^o, Quirine M. Ketterings, Joe Lawrence, and Greg Godwin in a July 2021 issue of *What’s Cropping Up*.