



Observations and thoughts about the 2014 corn crop in the Northeast.

Cooler weather with adequate nutrients and moisture provides slower grain fill for potential higher yields and test weights.

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Cooler temperatures this past corn growing season slowed down corn growth overall in our region. However, at most locations, rainfall has been slightly average to above average, and even excessive in some areas.

At many locations, planting dates were later than usual, and because of cooler temperatures the corn growth was slower throughout the season. As a result, we saw harvest take place at a slightly later calendar date than most years.

With all that said, how will yields be affected?

Yields are influenced by a combination of rainfall, temperature and nutrient availability. This year, decreased yields will be possible **in some locations** due to nutrient loss from leaching, depending on **rainfall amounts, especially during June**. This will also depend heavily on the **Soil Drainage Classification**. In some soils across the region with shaley, slatey and excessively well drained soil conditions, or soils with secondary drainage considerations, the available nutrients may have been leached out. This is especially true if those nutrients were in **highly soluble forms**. In these fields we see plant yellowing proceeding from the lower plant upward, in some cases from nutrient deficiencies, primarily nitrogen that leached. In addition, in cases where we had a the combination of poorly drained soils along with excessive rainfall amounts, then we saw cases of "**denitrification**" taking place, which also caused yellowing plants and shorter plant growth overall.

In cases where protected nitrogen sources were used, AND/OR split N applications, or where adequate applications of organic sources of N such as manures, composts and even killed cover crops or combinations of these, we typically didn't see as much leaching loss. The slower and steadier release of nitrogen from these organic N sources helps it stay in the root growing zone to the point where it can be used. Also corn crops planted into killed sods (grass hayfields or alfalfa fields and grass/alfalfa combinations) have looked very good as well due to the slower release of nutrients from the slowly decomposing root material throughout the season, which more closely matched the crop's N needs.

What we know from past analysis is that **higher corn yields** are associated with near to slightly above average rainfall, so in locations where this was the case - although the growing conditions from a temperature point of view were slower - they were not restricted by moisture, and we should see higher than normal corn yields with potential of higher than normal test weights as well.

*As long as the nutrients were available and not washed out with leaching, adequate moisture and cooler temperatures, what we see is **slower plant and kernel development**.*

There is a correlation of higher yields with average to slightly higher than average rainfall amounts and for the most part this is widely understood. But the correlation of yield with cooler than average summer temperatures (July-August and even into September) is not as widely understood.

Cooler temperatures during the grain filling period typically result in heavier kernels and higher grain yields compared to warmer temperatures (especially compared to excessive temperatures which are stressful to the plant).

If we look at the rate of grain fill on a “per-day” rate basis during cooler temperatures, the grain-fill proceeds more slowly during cooler periods than hotter periods; so although the rate is slower, the duration of the grain fill period by the number of days is actually longer. What does this mean?

The yield advantages of a lengthy grain fill period usually outweigh the disadvantages of the “slower” grain fill rate per day. The cooler weather growing period does slow down the maturation rate of the corn plant and this means a “longer period” of growth to provide dry-matter weight to each kernel of corn. ***As a result with this slower kernel fill development, we will have the potential for higher than average yields and higher than average test weights.***