Agronomy Facts 9
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An Aid for Determining Early Season Corn and Cotton Nitrogen Requirements for the Storm Stricken Southeastern US

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We have been receiving many calls about how much the recent rains affected their pre-plant or at-plant nitrogen. Hopefully this aid offers help in your decision making. Please feel free to contact us if you have any questions.

DISCLAIMER The Pre-Sidedressed Nitrate-Nitrogen Test (PSNT), is not intended for any crop or situation other than corn fields that utilize manure as a nutrient source. Desperate times call for desperate measures. The PSNT tool should never be used in this manner outside of emergency situations such as the one that has affected the South this late April - early May or until more sophisticated technologies for determining nitrogen status are developed.

Use the following decision tree to help determine a suitable solution. Please start at Key 1 then follow the appropriate scenario.

Key 1. Terrain sloped .....go to key 2
Else 1'. Terrain flat and not eroded .....go to key 3

Key 2. Topsoil eroded .....Reapply all fertilizer and possibly lime.
Else 2'. Topsoil not eroded .....go to key 3

Key 3. Cotton- pre-plant to prior to early bloom .....go to key 4
Else 3'. Corn .....go to key 6

Key 4. Nitrogen applied as ammonium nitrate, UAN or urea W/OUT urease inhibitor, anhydrous ammonia 2+ weeks prior to intense rain event.....go to key 5
Else 4'. Nitrogen applied as ammonium nitrate, UAN or urea W/OUT urease inhibitor, UAN, anhydrous ammonia applied within a week prior to intense rain event ....Assume only a fraction of the urea and ammonium has converted to nitrate nitrogen. Once in the soil, ammonium is not in danger of leaching or volatilization. Urea converts first to ammonium then nitrate. Unless, the soil is a very deep well draining sand, urea losses should be minimal. Only timely tissue analysis can provide you with a more accurate soil nitrogen status. Apply 30 lbs of nitrogen per acre only if seedlings look nitrogen deficient. Tissue sample ASAP at early bloom.
Else 4''. Nitrogen applied as urea or UAN WITH urease inhibitor (Agrotain) ....The stability of the urea and the urea in the UAN will depend on the rate at which the product was incorporated into the fertilizer and the time that has passed since the fertilizer/inhibitor combination was applied. According to the label, Agrotain used at the high rates can provide urea stability for up to 14 days. At lower rates, it can stabilize urea for 5-7 days. These are based on average conditions of 7.0 pH and 30% residue level. Therefore shorter periods of stabilization should be expected on soil with pHs higher than 7.0 and conservation tillage fields with residue greater than 30%. Assume most of the ammonium has converted to nitrate after a week of application. Only timely tissue analysis can provide you with a more accurate soil nitrogen status. Apply 30 lbs of nitrogen per acre only if seedlings look nitrogen deficient. Tissue sample ASAP at early bloom.

Key 5. Well drained fields, waterlogged for 2 days or less ....Assume all the urea and ammonium has converted to nitrate. Apply 30 lbs of nitrogen per acre only if seedlings look nitrogen deficient. Tissue sample ASAP at early bloom.
Else 5'. Poorly drained field, waterlogged for 2+ days ....Assume all urea, and ammonium was converted to nitrate prior to intense rain event. Denitrification can start after 2 days of waterlogged conditions. There is approximately a 4% loss of nitrate-nitrate nitrogen lost per day. Example: If the field has been waterlogged for 5 days, denitrification has occurred for 3 days. Therefore, 12% of the nitrate nitrogen has been lost to denitrification. If 80 lbs of N were applied, then nearly 10 lbs of nitrogen have been lost. Supplemental applications of nitrogen should take this into account. Apply 30 lbs of nitrogen per acre only if seedlings look nitrogen deficient. Tissue sample ASAP at early bloom.

Key 6. Corn germinated and emerged ....For corn plant less than 6" soon after the intense rain event occur perform a plant tissue analysis. Where tissue nitrogen is low apply a pre-plant rate of nitrogen. Preferably, if the corn is approaching 6 inches, perform a tissue analysis in combination with a PSNT (0-12 inches) soil test as soon as the corn is 6 inches tall (V6 growth stage with growing point emerging from the ground). Take plant tissue samples from the same point that the soil sample is taken. Use PSNT guidelines to determine your sidedressed nitrogen application rate. After V6 growth stage, only plant tissue analyses can best determine corn nitrogen need and soil nitrogen status.
Else 6'. Corn not yet germinated or emerged, inspect the seed or un-emerged seedling for viability .....go to key 7

Key 7. Nitrogen applied as ammonium nitrate, urea W/OUT urease inhibitor, UAN, anhydrous ammonia 2+ weeks prior to very heavy rain event.....go to key 8
Else 7'. Nitrogen applied as ammonium nitrate, urea W/OUT urease inhibitor, UAN, anhydrous ammonia applied within a week prior to intense rain event .... Assume only a fraction of the urea and ammonium has converted to nitrate nitrogen. Once in the soil, ammonium is not in danger of leaching or volatilization. Urea converts first to ammonium then nitrate. Unless, the soil is a very deep well draining sand, urea losses should be minimal. Test the soil for nitrate nitrogen status (0-12 inches). Use PSNT guidelines to determine your sidedressed nitrogen application rate. After V6 growth stage, only plant tissue analyses can best determine corn nitrogen need and soil nitrogen status.
Else 7''. Nitrogen applied as urea or UAN WITH urease inhibitor (Agrotain) .... The stability of the urea and the urea in the UAN will depend on the rate at which the product was incorporated into the fertilizer and the time that has passed since the fertilizer/inhibitor combination was applied. According to the label, Agrotain used at the high rates can provide urea stability for up to 14 days. At lower rates, it can stabilize urea for 5-7 days. These are based on average conditions of 7.0 pH and 30% residue level. Therefore shorter periods of stabilization should be expected on soil with pHs higher than 7.0 and conservation tillage fields with residue greater than 30%. Assume most of the ammonium has converted to nitrate after a week of application. Test the soil for nitrate nitrogen status (0-12 inches). Use PSNT guidelines to determine your sidedressed nitrogen application rate. After V6 growth stage, only plant tissue analyses can best determine corn nitrogen need and soil nitrogen status.

Key 8. Well drained fields, waterlogged for 2 days or less ....Assume all the urea and ammonium has converted to nitrate. Test the soil for nitrate nitrogen status (0-12 inches). Use PSNT guidelines to determine your

application of nitrogen. Tissue sample ASAP after emergence. Perform a PSNT (0-12 inches) together with a plant tissue analysis as soon as the corn is 6 inches. Take plant tissue samples from the same point that the soil sample is taken. Use PSNT guidelines to determine your sidedressed nitrogen application rate. After V6 growth stage, only plant tissue analyses can best determine corn nitrogen need and soil nitrogen status.

Else 8'. Poorly drained field, waterlogged for 2+ days ....Assume all urea, and ammonium was converted to nitrate prior to intense rain event. Nitrification can start after 2 days of waterlogged conditions. There is approximately a 4% loss of nitrate-nitrate nitrogen lost per day. Example: If the field has been waterlogged for 5 days, denitrification has occurred for 3 days. Therefore, 12% of the nitrate nitrogen has been lost to denitrification. If 80 lbs of N were applied, then nearly 10 lbs of nitrogen have been lost. Supplemental applications of nitrogen should take this into account. Tissue sample ASAP after emergence. Perform a PSNT together with a plant tissue analysis as soon as the corn is 6 inches. Take plant tissue samples from the same point that the soil sample is taken. Use PSNT guidelines to determine your sidedressed nitrogen application rate. After V6 growth stage, only plant tissue analyses can best determine corn nitrogen need and soil nitrogen status.

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