

NUTRIENT AVAILABILITY INTERACTION WITH COLD/WET SOILS

Corn planting in 2009 is behind schedule mainly due to a combination of excess moisture and below normal temperatures. These two factors combined with reduced tillage at planting and limited fall tillage in 2008, will potentially reduce nutrient availability for optimum early growth.

Bioavailability:

Available nutrients such as N, P, and S are released from residue and organic matter in a mineralization process. This process is regulated by soil microbes and the rate is influenced by the supply of organic forms, moisture and temperatures. Cold/wet soil conditions will reduce organic breakdown and reduce nutrients available from these organic sources.

Nutrient movement and uptake:

Immobile nutrients like P & K move very little in medium to fine textured soils. Nutrients are absorbed mainly by root interception and diffusion processes. Cool/wet soils will reduce root growth and slow down uptake from the diffusion process. The following shows P/K uptake at various temperatures:

Root zone temperature and P uptake in milligrams/pot

Soil Temperature

<u>59 F</u>	<u>68 F</u>	<u>77 F</u>
1.5	10.5	18.1

Soil temperature (60 F) and K uptake percentage

no K applied	0.4% K uptake
K applied	2.1% K uptake

Solution:

Two key nutrient decisions for cold/wet planting.

1. Fertilizer placement -- If your planter has a starter attachment, this would be a good year to use it
2. Broadcast adequate levels of P & K even if soil tests are high to increase the amount of granules that are close to roots for sufficient nutrient uptake. Less energy expended by the plants finding the needed nutrients results in higher yield potential.

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