

When The Rain Comes



Fertility management must be given special consideration when soils are wet or flooded.

BY CLIFF SNYDER

EXTRAORDINARY weather last year impacted significant amounts of cropland and crops in many areas. Some areas were excessively wet, a condition that could influence fertility management for 2003.

Below are tips for managing these types of soil conditions for nitrogen (N), Phosphorus (P), Potassium (K), and other nutrients.

Nitrogen

In areas where moisture is excessive, soil conditions are ideal for denitrification and leaching losses of available nitrate-N. Factors to remember include:

- * Warm temperatures during much of 2002 likely resulted in better than normal organic matter mineraliza-

tion, making more N potentially available for crop uptake, but also for leaching or denitrification in wet soils.

- * Where soils have been cool, N release from legume residues and manure has been slowed.

- * Wet soil conditions in fall/early winter will keep N mineralization at a minimum.

- * Low soil N levels mean little flexibility for N rates in 2003.

- * Confirm soil N availability by residual nitrate soil tests.

- * Nitrogen use efficiency will be affected by adequate availability of P and K.

- * Low soil N will make pre-plant and starter N especially important in 2003.

- * Surface soils reworked by floodwaters may be especially low in available N.

Phosphorus

Most crops have a beneficial association with a fungus — which forms mycorrhizae (root fungus) — colonizing their root system. This fungus aids P absorption by crop roots.

Mycorrhizae activity is often depressed after fallowing or moisture-saturation, producing severe P deficiency conditions. A reduction in the amount of P supplied by breakdown of organic matter also contributes to the problem. Zinc (Zn) availability will also be lowered by the same processes. Corn is probably the most sensitive crop to fallow or flooded soil syndrome, but soybeans and wheat are known to be affected as well.

Points to remember for P management on soils that have been excessively wet:

- * Starters containing P should be considered for corn, grain sorghum, and cotton ...even when soil test levels are high. A rate of 40 to 70 lb P₂O₅/A normally corrects the problem.

- * High soil test P levels can help avoid plant growth problems on fallow or flooded soil, but the minimum level has not been clearly defined.

- * Research on flooded soils indicates that lower P availability may or may not be detectable by soil tests for P.

Potassium

Substantial compaction

from traffic and tillage on wet soils frequently occurs. Research has demonstrated that K management becomes increasingly important under compacted, wet, and cold soil conditions.

Consider the following:

- * Leaching on sandier soils (cation exchange capacity less than 5 to 7) may have removed much of the available K.

- * Leaching on clay soils is not likely to have so much effect on K availability.

- * Soil testing can be an important indicator of K availability on soils which have been subjected to flooding.

- * Besides rebuilding soil test levels on leached soils, remember that starter K is particularly important when soils are compacted, wet, and/or cold.

- * Split applications of K may benefit crops, especially on sandier soils.

Other Nutrients

- * Sulfate-sulfur (S) may have also leached on sandier soils. Growers should consider applying 10 to 20 lb S/A in the sulfate form.

- * Growers should pay attention to magnesium (Mg), especially on sandier soils receiving high rates of K.

Snyder is Southeast director of the Potash & Phosphate Institute.