10-6-2003

Drought impacts on soil fertility management

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Abstract
If crop production was severely reduced because of dry conditions this year, there are a few items you can consider when planning for next year's crop. One, with severely damaged crops and low yields you might credit some of the phosphorus (P) and potassium (K) applied for this year's crop to next year, as much less removal will occur in grain harvest of the lower than expected yield.

Keywords
Agronomy

Disciplines
Agricultural Science | Agriculture | Agronomy and Crop Sciences | Meteorology | Soil Science

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If crop production was severely reduced because of dry conditions this year, there are a few items you can consider when planning for next year's crop.

One, with severely damaged crops and low yields you might credit some of the phosphorus (P) and potassium (K) applied for this year's crop to next year, as much less removal will occur in grain harvest of the lower than expected yield. However, if drought-damaged corn was harvested for silage instead of planned grain harvest, then P and K removal may not be much different than planned because of greater removal with the plant foliage. This is especially the case for K because of its high content in silage.

Estimates of nutrient removal for drought-damaged crops should be checked against actual applications to see if it is feasible to account for P or K toward the next crop. As an example, if soil test levels were in the optimal range and you applied 55 lb P_2O_5/acre and 45 lb K_2O/acre to account for nutrient removal in an expected 150 bu/acre corn crop, but only harvested 50 bu/acre, then removal in the grain would be only 20 lb P_2O_5/acre and 15 lb K_2O/acre. Hence, there would be a remaining 30 lb P_2O_5 and 30 lb K_2O/acre that could be applied to the 2004 crop. What if the corn was harvested for silage instead of grain? If the drought damaged crop of 50 bu/acre grain equivalent was harvested for silage, the expected removal of K_2O in the silage would be 63 lb K_2O/acre, which is greater than the amount applied. The removal of P_2O_5 in this silage example would be 28 lb P_2O_5/acre, still less than the amount applied. Each field situation should be evaluated because of varying soil test levels, yield levels, and appropriateness for adjusting future applications.

Two, when collecting samples this fall for soil testing, watch the soil sampling depth. It can be difficult to sample to the recommended 6-inch depth when soils are dry and hard. If you can't sample to the correct depth, don't take the samples. Shallow sampling will result in incorrect results and recommendations. If low rainfall persists after harvest, less K may be leached from remaining crop residues. This could impact soil test K results.

Three, application of anhydrous ammonia could be difficult if soils remain extremely dry. The dry soils can cause both difficulty in getting good knife injection depth and soil coverage to limit volatile escape of ammonia during application.

Four, dry soils with low profile moisture should help lessen potential nitrogen (N) losses next spring from residual nitrate and fall-applied fertilizer and manure-N. Since dry soils can absorb considerable moisture before becoming excessively wet or leaching, N converted to nitrate may be less at risk for loss next spring. Time will tell how much moisture recharge is received this fall and next spring. Fall N applications should be delayed until soil

temperatures are 50 °F and cooling.

In areas with severely damaged corn, one could consider planting corn after this year's corn to take advantage of carryover (residual) N not used by this year's crop. However, there is the risk that residual nitrate may not remain in the rooting zone. Also, it may not be worth other risks such as lower corn yield for corn following corn and increased disease incidence if soybean is planted following soybean due to rotation changes and desire to maintain crop acreages.

This article originally appeared on page 166 of the IC-490(22) -- October 6, 2003 issue.
