

# Integrated Pest & Crop Management

## Drought Conditions That Persisted in Part of September and October Resulting in Low Soil Potassium Levels in Soils

By Manjula Nathan

There have been quite a few calls from crop consultants, growers and researchers regarding the low soil potassium (K) levels being reported from soil testing labs. This is due to the dry weather conditions that persisted during the months of September and October in Midwest region. Iowa, Missouri, Indiana, southern Illinois and western Kentucky received less than half their normal rainfall in October. Missouri recorded the 4th driest October in 138 years and the driest since 1964. In Missouri during the month of September, the Bootheel area was classified as in severe drought. As a result, harvest progressed rapidly and earlier than normal. The crops matured early and the weather in late September and most of October provided ideal conditions for field work and soil sampling. Thus the MU soil testing labs have been loaded with samples for analysis. Persistent dry weather conditions and associated low soil moisture conditions can affect the soil K levels.

The dry fall conditions resulted in soil K levels lower than expected. The wet and favorable weather conditions that prevailed early in the growing season resulted in good plant stand, plant vigor and root establishment, enhancing the uptake of plant nutrients like nitrogen, phosphorus and potassium, and higher yields. Most of the K taken up by the plants during the growing season remains in the crop residue. As the crop grows and matures, uptake lowers the available soil test K levels in soils. For example 160 lbs of K<sub>2</sub>O is removed by plants to produce 150 bu/ ac of corn. For corn, wheat and sorghum, most of the K is in the vegetation and only about 25 – 30% in the grain. Once the grain was harvested there wasn't sufficient rain to leach the K from the crop residues back into the soil. So the soil test K comes out as lower than expected from these fields. A quick comparison of the soil test results of samples received by the MU soil testing labs from July to Dec 2009 and July to Nov 2010 reveals about a 12% increase in the number of the samples tested as being very low to medium levels from 2009 to 2010 during this period.

Soybean grain contains about 60% of the total K taken up by the crop, so the removal is higher. Therefore, the K content in corn residue is higher than in soybean residue.

The drier conditions that existed in October would have resulted soil test K values being lower in corn fields than in soybean fields. Since the K is still remaining in the residue, growers need not panic over the lower soil test K levels in soils as eventually with sufficient rains the K will leach from the residues to the soil.

### Reference:

1. Jim Camberato, *Purdue University News Service*. Nov 1, 2010.
2. Lloyd, Murdock. *Managing Seasonal Fluctuations of Soil Tests*. University of Kentucky Cooperative Extension Services. AGR-189.

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