



August 10, 2011

Potassium Management for High Yield Corn and Soybeans

AGRONOMY TOPIC OF THE WEEK

Potassium (K) deficiency is beginning to be a more common reality across many fields in Minnesota and the Midwest. The deficiency has become increasingly relevant in many fields across major production areas in the Corn Belt since the mid-90's, according to research from Iowa State. Symptoms are being observed on both corn fields and in some soybean fields. The symptom for both crops is yellowing of the leaf margins of the older leaves that usually begins at the leaf tip and extends down the margins toward the leaf base. With severe deficiency the leaf edges may become brown as the tissue dies and affected plants appear stunted while the newest leaves typically appear to be normal in appearance. If unchecked, in extreme cases the deficiency can result in greater than 50% yield reduction as well as decreased grain quality. A recent survey by the Potash & Phosphate Institute (PPI) reports that nationally about 43% of soils were potassium deficient. The same survey also identified a greater concentration of the low testing soils to be in the Midwest.

Unfortunately, because deficiency symptoms usually appear relatively late in the season, there is no certain economically effective corrective treatment for the current crop. Recent research has shown that foliar fertilization with a low-salt fluid fertilizer containing K can increase soybean yield only in some conditions and insufficient data is available for corn. The fact that deficiencies usually occur in small and isolated field areas limits the cost effectiveness of this treatment. If you see deficiency symptoms, the best practical thing to do is to prevent deficiency for future crops, meaning that it is critical to be proactive rather than reactive. If potassium deficiency is a possibility or is known to be a limiting factor in your fields, you may want to soil sample more often, such as every other year instead of every four years. It is also strongly recommended to implement a grid sampling program with a minimum grid size of 2 ½ acres.

It has been noted by Iowa State Agronomists that in past years, the recommended application rates for potassium may have been on the conservative side. With higher yielding corn and soybean varieties available as well as more recent and extensive soil testing research, Iowa State University changed the soil test potassium interpretation classes and now recommends maintaining a higher soil potassium level and slightly higher application rates for the new low-testing categories. A need to update soil test interpretations for potassium was initially addressed during the middle 1990s as a result of observations of an increasing frequency of K deficiency symptoms in corn and soybeans, even in some soils that tested in the optimum category according to interpretations at the time. Additional field experiments have been designed to evaluate K placement methods which have often showed larger than expected yield responses in soils testing optimum, and sometimes high categories when using the adjusted rates of potassium application.