Potassium (K) is an important nutrient for soybean development. It is involved in most of the plant’s life-sustaining processes and is its most heavily absorbed nutrient after nitrogen. It is estimated that a 40 bu/ac soybean crop will uptake about 140 lb/ac potash (K2O). About one-half this amount is stored in the soybean seed and is therefore removed from the field each year at harvest. Young soybean seedlings do not use a lot of potassium, but the uptake pattern during plant development is similar to that of nitrogen, and the rate of uptake peaks during the rapid vegetative growth period. Much of the potash taken up in the vegetative period is then transferred to the seed during pod fill.

Potassium deficiency can severely limit soybean yield potential; deficiencies can also lower disease resistance and impact nodule formation. Deficiency symptoms are most likely seen during the period from late flowering to early seed fill, and deficiency during the late vegetative stage to seed fill can affect seed fill. Deficiency symptoms can be accentuated when soil conditions are very dry because much of soil potash moves to roots by mass diffusion (i.e., area of high concentration to low concentration) although root interception is also important.

Project

A three-year on-farm project was established to assess if added liquid potash fertilizer could increase soybean yields and reduce deficiencies by providing an easily accessible source of potassium. The project also evaluated what soil types would have the greatest responses based on the existing soil test levels.

Methods

Data was collected at 15 sites over three years. Two trials were conducted in 2010, seven trials in 2011, and six in 2012. Trials included a minimum of two replications per location and were across a variety of locations, soil types, tillage systems, and soil test levels. Plots were planted with a Kearney 15-inch vacuum planter with John Deere 7000 planter units, and the fertilizer was applied in furrow. Plots were a minimum of 20 ft wide by 1,000 ft long. Some sites were planted by farmer co-operators using the same protocol.

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