Sulfur deficiency in corn and watermelon

Jerry Brust, UME

In the last few weeks several sweet corn fields as well as some watermelon and even a few tomato fields have been found with sulfur deficiencies (figs. 1 and 2). In sweet corn symptoms often appear as green leaves with light yellow or green striping on the newer leaves (fig. 1). In watermelon symptoms appear as a light green or light yellowing of the leaves of newer growth (fig. 2). In tomato unless severe you usually do not see any visible sulfur deficiency symptoms in the field, but fruit set and quality could be worse. Sulfur is vital to plant growth as it helps develop enzymes in plants. A deficiency in sulfur affects a plant’s protein synthesis, structure, and chlorophyll production (hence why plants turn a pale green or light yellow). Overall plant development and growth are stunted without enough sulfur. Newly transplanted vegetables often have a higher mortality rate than is typical.

This is the fourth year that we have seen sulfur deficiencies in at least two of these three crops (it is a bit unusual to see sulfur deficiency in tomato). I have not seen consistent sulfur deficiencies in other vegetable crops over this same time period. Sulfate is relatively mobile in most soils and sulfur deficiencies can occur with heavy rainfalls. Organic matter supplies most of the sulfur to the crop, but sulfur must be mineralized to sulfate-S to be taken up by crop plants. Because mineralization is carried out by soil microorganisms, soil temperature and moisture primarily determine when and how much sulfur is made available to the crop. Excessively wet or dry conditions reduce microbial activity and reduce S availability from soil organic matter. For all the above reasons under field conditions sulfur deficiency and its symptoms can be highly variable. Although sandier soils are much more likely to be deficient in sulfur, I have seen sulfur deficient watermelon and sweet corn in soils with higher levels of clay or organic matter (2-4% OM).

There are other deficiencies that can cause striping or the general yellowing in sweet corn or watermelon respectively and only by conducting a tissue test can you be sure. Sulfur can be added to the crop in combination with several other nutrients such as ammonium or potassium and spray-grade ammonium sulfate is a good choice for foliar applications.

Fig 1 Sulfur deficiency symptoms in older and younger sweet corn
Fig. 2 Sulfur deficiency in watermelon - foreground melons worse