

Response of Plenish soybeans to manganese foliar application

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DuPont Pioneer has developed high oleic varieties of soybean called Plenish soybeans to answer the call for a healthier option to trans fats in our food system. While proper nutrients optimize the oleic oil content, the effect of a deficiency in the micronutrient manganese on the oil profile of Plenish soybeans has not been studied. The purpose of this two year study was to test how manganese application might affect the oil profile of Plenish varieties. The experiment was done in a full factorial, randomized complete block design with four replicates of different Plenish and non-Plenish varieties and three manganese treatment regimes carried out in two locations. When soybeans reached V2 growth stage, leaf tissues were analyzed and manganese concentration was measured. After harvesting, seeds from all different treatments were analyzed for oil profile, oil percentage, and protein percentage. In the first year, seed quality was not affected by manganese application, but when leaf manganese levels were low (below 21ppm), there was a significant effect on yield in both Plenish and non-Plenish varieties. The second year of the study found there were no low manganese levels present and manganese application had no effect on yield or quality factors when manganese levels were sufficient. Detrimental weather conditions led to low yields (8.9 to 26.7 bu/acre) at the Northwest site, but no effect on the oil profile was observed with a significant difference maintained between Plenish and non-Plenish varieties. In summary, the results show that the level of manganese does not affect seed quality, but can affect the yield when manganese is deficient.