Soybean Growth Response to Varying Nitrogen Rates and Source. (S04-osborne144036-Poster)

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Abstract:

Nitrogen (N) fertilizer application to soybeans (Glycine max (L.) Merr.) has been evaluated in respect to yield, however little information is available on the effect of N with respect to soybean growth characteristics. The objective of this research was to evaluate the response of soybeans to various rates and sources of N applied at planting. To evaluate this objective a greenhouse experiment was designed and conducted at two separate times. The experiment was a randomized complete block design with two N sources (ammonium nitrate (AN) and urea (UR)) applied at four N rates (0, 7.8, 15.7, and 23.5 kg N ha-1). Nitrogen fertilizer was located 5 cm below seed placement. Six soybean plants were established in 25.4 cm diameter pot. Plant sampling occurred at R1 and R7 phenological growth stage. Measurements collected at each growth stage included; photosynthesis, chlorophyll meter reading, plant ureide, nitrate, and N concentrations. Two soybean plants were sampled at each sampling date. Plants were separated into various parts (leaves, stems, petioles and pods) and weighed. Plant photosynthesis was not altered by different N application rate or source at any sampling date. Soybean growth was reduced at the R7 sampling when N was applied as AN at 23.5 kg N ha-1, while N concentration, ureide and chlorophyll meter reading increased. In contrast to the lower plant weight at R7, final grain weight per bean, total bean weight and grain protein were significantly higher compared to the check with no differences in oil content. Although there were few significant differences, and those differences were small, it is important to note that applying N at time of planting has the potential to increase soybean bean yield and protein while maintaining oil content.

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