Soybean Seed Yield Was Not Influenced by Foliar Applications of Sugar

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Soybean [Glycine max (L.) Merr.] yield in the Midwest has increased at < 0.5 bu/acre per year (5). Record soybean yield contest reports (4) coupled with high commodity prices and growers frustrated with minimal yield gains have combined to generate much interest among growers regarding the inputs needed to increase soybean yield. One input that has garnered considerable attention among growers and some agriculture input suppliers is the foliar application of sugar products to increase yield (1,2). Various benefits are often cited among retail suppliers of foliar-applied sugars; however, there is no known scientific evidence regarding the effectiveness of such applications. The objective of this research was to evaluate soybean yield in response to various sources of foliar-applied sugar across four states in the Midwest. Our null hypothesis was sugar would not affect soybean yield.

Field research studies were conducted at Arlington, WI, Urbana, IL, St. Paul, MN, and West Lafayette, IN, in 2010. All trials followed corn (Zea mays L.). Management of crop fertility and pests was conducted using state recommended best management practices. All trials utilized high-yielding, glyphosate-resistant soybean cultivars with relative maturity and other agronomic traits selected specifically by location. Row widths ranged from 7.5 to 30 inches across locations and all plots were established in May. The experimental design was a randomized complete block with nine sugar treatments replicated four times. Plots were an average of 10 ft wide by 30 ft long in all locations, and all trials were planted and harvested with standard soybean research plot equipment.

The four sources of sugar evaluated in this study were: (i) granulated cane sugar (100% sucrose); (ii) high fructose corn syrup (11 g glucose/fructose per 30 ml); (iii) molasses (28 g sucrose per 30 ml); and (iv) blackstrap molasses (26 g sucrose per 30 ml). All treatments were applied at the equivalent rate of 3 lb sugar/acre and diluted in tap water for a final total spray solution of 15 to 20 gal/acre. Foliar applications were made with a hand-held, CO₂ pressurized backpack plot sprayer at all locations (Fig. 1). The treatments consisted of an untreated check, all four sources of sugar applied at V4, granulated cane sugar and blackstrap molasses applied at R1, granulated cane sugar applied at V4 and R1, and blackstrap molasses applied at V4 and R1 (3). The V4 and R1 growth stages were selected to coincide with common glyphosate application times.