

Sugar Applications for Corn and Soybean

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Objective

To determine if a foliar application of sugar in season can increase yield of corn or soybean.

Background

Crop Year: 2013

Location: Western Agricultural Research Station

County/Town: Clark/ So. Charleston

Conditions for corn trial

Soil type: Strawn-Crosby complex SiClLo

Drainage: Random

Previous Crop: Soybean

Tillage: No till

Soil test: pH 7.1, OM 1.5%, BP1 6 ppm, K 92 ppm

Planting date: May 29

Seeding rate: 32,200 s/A

Harvest date: November 4

Conditions for soybean trial

Soil type: Kokomo SiClLo

Drainage: Pattern tilled

Previous Crop: Corn

Tillage: stale seedbed with March field cultivator

Soil test: pH 6.5, BpH 6.8, OM 2.1%, P 35ppm, K 161 ppm

Planting date: May 17

Seeding rate: 150,000 s/A

Harvest date: October 11

Methods

Two trials using sugar foliar applications were conducted at the Western Agricultural Research Station, one on corn and one on soybeans. Both were randomized complete block design with four replications. Two types of sugar were applied to corn: dextrose (ADM - Archer Daniels Midland) or sucrose (Domino) each applied at 4 lbs/A in a 20 gallon/A solution. Soybeans were treated with sucrose (Domino) at 4 lbs/A at R2 or Headline at 9 oz/A at R3 in 20 gal/A solution. The foliar applications were applied with a CO₂ compressed gas driven hand boom at 20 gpa at 35 psi, with 8002XR tips.

- Conditions at time of sugar applications were
 - overcast and damp for corn at V5 (5 leaf collars) on July 3rd and for
 - soybeans at R2 (full flower) cool, cloudy, and damp on July 9th.
 - Headline was applied at R3 (beginning pod) on July 30.
- Seed source Seed Consultants: corn - SC10HQ81, soybean – SCS9319RR

Results

Table 1 shows yield results for the corn sugar trial. There were no significant differences between the treatments. Table 2 shows yield results for the sugar and fungicide treatments.

Table 1. Corn yield in response to two types of sugar applications, South Charleston, Ohio, 2013.

Foliar application	Yield (bu/A) at 15.5% moisture
Untreated check	150.4
Sugar – dextrose, 4 lb/A	165.1
Sugar – sucrose, 4 lb/A	163.6
P value	0.6787
LSD (0.10)	NSD

Table 2. Soybean yield in response to sugar or Headline fungicide application, South Charleston, Ohio, 2013.

Foliar application	Yield (bu/A) at 13% moisture
Untreated check	73.7
Sugar – sucrose, 4 lb/A	74.4
Headline fungicide 9 oz/A	79.9
P value	< 0.0001
LSD (0.10)	4.1

Summary

Two sugar types were applied on corn due to some controversy over the “best” sugar for foliar applications to corn. As shown in Table 1, corn yield was not significantly different ($p = 0.6787$) for either sugar application as compared to the check. Reports from producers indicated that best conditions for application of sugar were cool, even damp conditions to achieve the greatest response; those conditions were found here, but still no significant difference in yield was shown.

Soybean conditions were similar to those at the time of sugar to corn, but as shown in Table 2, there was no yield difference between the untreated check and the sugar application. Headline fungicide was added as an applied treatment to compare with the sugar application for its reported affects on plant health. The application of the Headline fungicide here did significantly improve yield ($p < 0.0001$). Some disease was observed but not quantified; Septoria brown spot in the lower canopy and Frogeye leaf spot in the upper.

Acknowledgement

The author expresses appreciation to Bill Mullen of Seed Consultants, Inc. for seed, to Robert Mullen for statistical assistance and to the crew of the OARDC Western Agricultural Research Station and Manager Joe Davlin for assistance with planting, harvest and field support.

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