

Could Sugar Help Drought Stressed Corn?



DR. CHAD LEE

LEXINGTON, KY.

The dry weather has farmers looking for any options to alleviate drought stress. Some are tempted to try sugar. Plants make glucose sugar through the process of photosynthesis. Crop scientists estimate that about 78 pounds of glucose is needed to produce one bushel of corn and 119 pounds of glucose is needed to produce one bushel of soybean.

To extend those calculations, 50 bushels of soybeans require about 5,965 pounds of glucose and 200 bushels of corn require about 15,580 pounds of glucose. In comparison, some of the products being sold are putting on 16 fluid ounces of product. Those products contain 34 percent sugar, which comes out to 5.44 ounces of sugar per acre. That is a very small amount compared to what the crops require.

Some of the products claim activity to boost micro-organism activity in the soil and that will help with uptake of nutrients. But, there may be as much as 2,000 pounds of bacteria per acre of soil. There are other micro-organisms as well, including fungi. Is 5.44 ounces of sugar enough to feed 2,000 pounds of bacteria plus the fungi and other organisms?

Researchers investigated various forms of sugar applied at 3 pounds per acre to soybeans across Minnesota, Wisconsin, Illinois and Indiana. Some of the sugar sources were applied two times. No yield increases were observed in any of those locations.

The cost of some of these foliar products is also concerning. In one scenario, 16 fluid ounces is said to cost \$6.00/acre. If the equivalent rate of sugar was applied as corn sugar purchased in bulk, the cost would be around \$0.24/acre.

Spending \$6.00 on 5 ounces of sugar when a corn crop uses 78 pounds of sugar for each

bushel seems like a long shot for any yield effect.

While drought stress on the crop is extremely frustrating, and most producers want to try to do something...sugar most likely is not the answer.

Calculations:

- 1 bu of corn = 56 pounds and 1 bu of soybean = 60 pounds
- 16 fl oz of a foliar product (34% sugar) equals 5.44 oz of sugar. So \$1.10/ fl oz of sugar = \$6.00/acre
- corn sugar or high fructose corn syrup (24% water + 55% fructose + 42% glucose) costs up to \$700 / Metric Ton in bulk sales, according to alibaba.com
- 1 metric ton = 1,000 kg \approx 722 L \approx 24,413 fl oz (bulk density of corn sugar 1.384 kg/L)
- So, \$700 Metric Ton \approx \$0.03 / fl oz of corn sugar
- Corn sugar is 76% sugar. If cut in half with water, the solution is 38% sugar. 8 fl oz/A of corn sugar (or 16 fl oz of 38% sugar solution) = \$0.24/A (Note: this does not include a shipping charge and assumes that the cost of water is zero. If water and shipping doubled the cost of corn sugar, the bulk corn sugar is still much cheaper than the foliar product.)

References:

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DR. CHAD LEE: Extension Agronomist, University of Kentucky