



Dicamba Formulation Impact on Corn

Trial Objective

- Dicamba, a growth regulator, is an effective herbicide for early weed control in corn. However, using a dicamba formulation that doesn't contain a safener can cause brace root abnormalities (fusing) and increased stalk brittleness.¹ These injuries can lead to an increase in greensnap, root lodging, and a subsequent decrease in corn yield.
- The objective of this study was to determine the effect of safened versus unsafened dicamba products on plant health and yield of corn.

Research Site Details

Location	Soil Type	Previous Crop	Tillage Type	Planting Date	Harvest Date	Potential Yield (bu/acre)	Seeding Rate (seeds/acre)
Gothenburg, NE	Hord silt loam	Corn	Strip till	4/30/20	10/31/20	250	36,000

- The study was setup as a split-plot design with herbicide treatments as the whole plot and corn products as the sub-plot with four replications.
- The three herbicide treatments were a non-dicamba treated check, an unsafened dicamba product application, and a safened dicamba product application.
 - » The unsafened dicamba formulation was Sterling Blue® herbicide at a rate of 0.5 qt/acre.
 - » The safened dicamba formulation was DiFlexx® herbicide at a rate of 0.5 qt/acre.
- All dicamba treatments, including the non-dicamba check, were applied on 6/24/20 in combination with Delaro® 325 SC fungicide (0.125 qt/acre), Roundup PowerMAX® herbicide (1 qt/acre), and AMS (17 lb/100 gallon) at the V6 growth stage of corn.
- Five corn products were used in this study.
 - » 104 relative maturity (RM) and 107-RM corn products with growth regulator herbicide injury ratings of CAUTION.
 - » 105-RM, 109-RM and 113-RM corn products with growth regulator herbicide injury ratings of ACCEPTABLE.
- All treatments received herbicide applications of Roundup PowerMAX herbicide (32 oz/acre), Harness® herbicide (2 pt/acre), Balance® Flexx herbicide (3 pt/acre), and Atrazine 4L herbicide (32 oz/acre) on 5/1/20.
- Corn was sprinkler irrigated and fertilized with 70 lb phosphorus/acre, 15 lb sulfur (S)/acre, and 27.5 lb nitrogen (N)/acre via strip till on 4/26/20; 100 lb N/acre applied 4/28/20 using Stream Bars; and 15 lb S/acre and 90 lb N/acre applied sidedress on 6/26/20 with 360 Y-DROP® applicators.
- Shelled corn weight, moisture, and test weight were collected to calculate average yield. Corn greensnap counts were taken to determine the percent greensnap.



Figure 1. Corn product on August 17, 2020 with the safened dicamba formulation treatment of DiFlexx® herbicide.



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Understanding the Results

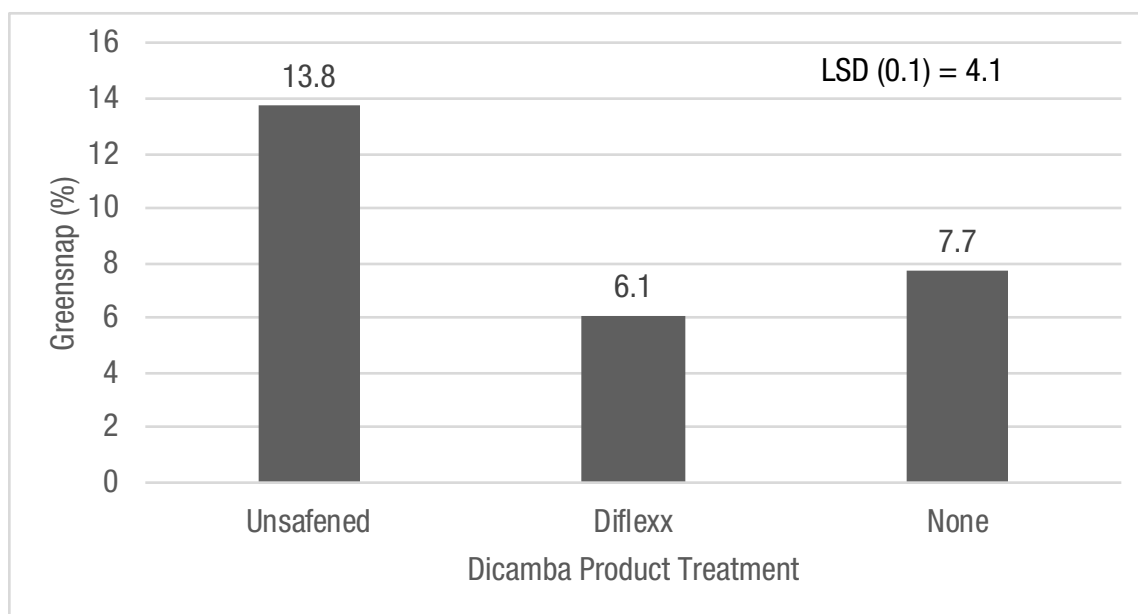


Figure 2. Average corn yield with unsafened and safened dicamba herbicide products.

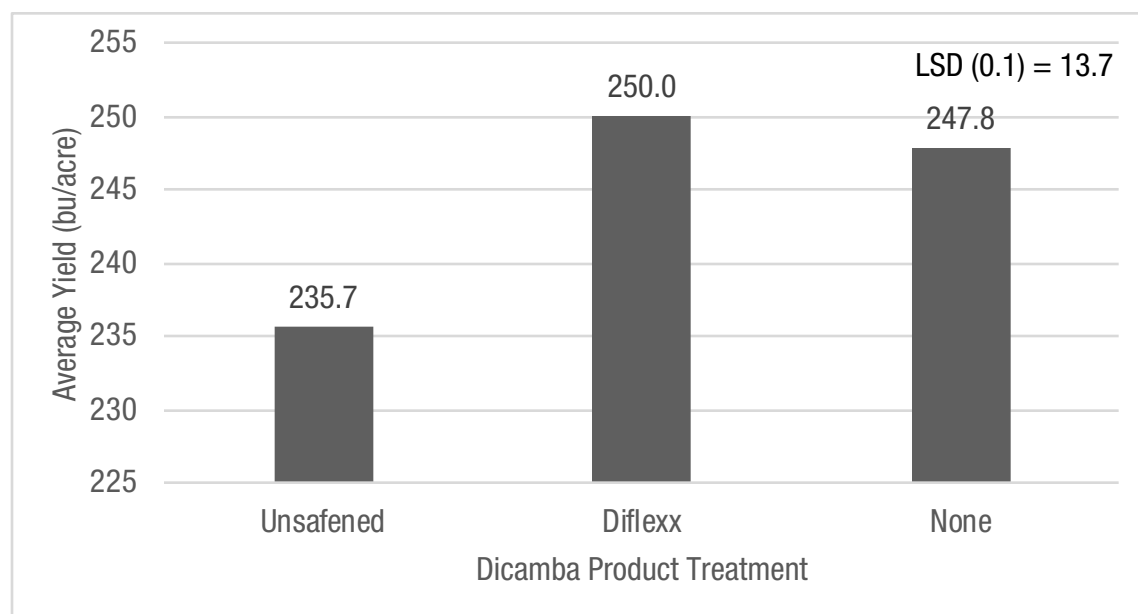


Figure 3. Greensnap percentage impact from unsafened and safened dicamba herbicide products averaged across corn products.



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Table 1. Average greensnap percentage and yield for each corn product under different dicamba herbicide formulation treatments.

Corn Product	Non-treated		DiFlexx® Herbicide (Safened)		Unsafened Dicamba	
	Greensnap (%)	Average Yield (bu/acre)	Greensnap (%)	Average Yield (bu/acre)	Greensnap (%)	Average Yield (bu/acre)
104-RM	16.1	235.6	7.4	243.2	22.4	217.9
105-RM	12.0	243.4	12.4	243.1	18.3	224.5
107-RM	1.3	253.2	2.4	246.9	2.4	239.6
109-RM	6.2	255.2	4.3	256.8	11.1	241.0
113-RM	2.9	251.4	4.2	254.2	11.1	244.3

- For this trial, the safened dicamba formulation treatment of DiFlexx® herbicide produced an average corn yield that was significantly greater than the unsafened dicamba formulation herbicide treatment (Figure 2).
- Corn greensnap percentage was significantly higher for the unsafened dicamba formulation treatment compared to the safened DiFlexx herbicide treatment and the non-treated check (Figure 3).
- The greater percentage of greensnap in the unsafened dicamba formulation treatment was likely a result of stalk brittleness that directly reduced corn yield.
- There was little difference in percent greensnap between corn products with CAUTION and ACCEPTABLE growth regulator herbicide injury ratings (Table 1).

Key Learnings

- Unsafened dicamba formulation products can have the potential to cause corn to greensnap at a higher rate than corn treated with safened dicamba formulation products.
- Farmers are encouraged to use safened dicamba formulation products like DiFlexx® herbicide as an option for early weed control in corn to help lower the risk of crop damage and decreased yield potential that can be observed when using unsafened dicamba herbicide products.

Reference

¹ Clay, S. 2016. Chapter 42: Herbicide injury to corn. In Clay, D., Carlson, C., Clay, S., and Byamukama, E. (eds). iGrow Corn: Best Management Practices. South Dakota State University. <https://extension.sdstate.edu>.

Legal Statements

The information discussed in this report is from a single site, replicated demonstration. This informational piece is designed to report the results of this demonstration and is not intended to infer any confirmed trends. Please use this information accordingly.

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