

# **Effect of Soybean Cultivar and Foliar Fungicide Application on Southern Stem Canker of Soybean**

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## **Objectives:**

The objective of this research was to evaluate the effect of foliar fungicides on southern stem canker (caused by the fungus *Diaporthe aspalathi*) when applied to soybean cultivars differing in their susceptibility to the disease.

## **Materials and Methods:**

Field trials were conducted in Caldwell County (at the University of Kentucky Research & Education Center near Princeton, KY) and in Daviess County (on a farmer's field near Owensboro, KY) in 2019. At each location, a soybean cultivar resistant to southern stem canker (Dynagro 44XS68) and susceptible to southern stem canker (Dynagro 43XS27) were planted into fields that had been planted to soybean the previous year. Plots were 4 rows wide (30 inch row spacing) and either 20 ft long (Caldwell Co.) or 25 ft long (Daviess Co.). Plots were arranged in a randomized complete block design with either 4 replications (Caldwell Co.) or 3 replications (Daviess Co.). Different fungicide products were applied at different growth stages with a carbon dioxide-pressurized backpack sprayer calibrated to deliver 20 GPA at 40 PSI pressure (Table 1). When soybean plots were approximately at the R5 growth stage (beginning seed development), incidence (%) of plants affected by southern stem canker was recorded. Plots were harvested with a small plot research combine and grain yields were calculated and adjusted to 13% moisture.

## **Results:**

Statistically significant differences were detected among treatments for southern stem canker incidence and yield at both locations (Table 1). By far, the largest differences observed were between soybean cultivars, where the southern stem canker susceptible cultivar (43XS27) had the greatest incidence of southern stem canker and the lowest yield compared to the resistant cultivar (44XS68). Within a cultivar, the only observed differences in southern stem canker incidence relative to the non-treated check was with Quadris applied at V5 and Priaxor applied at R3 on the susceptible cultivar (43XS27). The only observed difference in yield relative to the non-treated check within a cultivar was with Priaxor applied at R3 on the susceptible cultivar (43XS27). The field in Caldwell County, KY had extremely high southern stem canker pressure, which caused major yield reductions on the susceptible cultivar compared to the resistant cultivar.

## **Conclusions and Implications:**

Southern stem canker has been a re-emerging disease in Kentucky in recent years. Fields that have been planted to continuous soybean and susceptible cultivars have been affected the most. Our research trials showed that, in general, foliar fungicides are relatively ineffective in controlling southern stem canker, and that planting a resistant cultivar will have a much greater impact on southern stem canker.

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**Table 1.** Effect of soybean cultivars and foliar fungicides on southern stem canker incidence and yield at trials conducted in Caldwell and Daviess Counties, KY in 2019.

Cultivar	Treatment	Rate (fl oz/A)	Timing	Caldwell County, KY		Daviess County, KY	
				Stem canker incidence (%)	Yield (bu/A)	Stem canker incidence (%)	Yield (bu/A)
43XS27 (Susc.)	Nontreated	-	-	98.8	10.8	38.3	52.8
	Priaxor	8	V5	98.8	14.4	16.7	60.5
	TopGuard	14	V5	97.5	11.6	30.0	52.7
	Topsin	20	V5	98.8	11.6	43.3	49.4
	Quadris	15.5	V5	75.0	14.2	30.0	53.2
	Priaxor	8	R1	98.8	13.0	26.7	59.0
	TopGuard	14	R1	96.3	11.8	46.7	55.7
	Topsin	20	R1	98.8	9.2	26.7	55.8
	Quadris	15.5	R1	97.5	7.7	33.3	54.2
	Priaxor	8	R3	73.8	26.7	26.7	59.6
	TopGuard	14	R3	98.8	9.1	36.7	53.3
	Topsin	20	R3	98.8	12.4	18.3	59.5
	Quadris	15.5	R3	97.5	7.2	38.3	52.1
44XS68 (Res.)	Nontreated	-	-	0.0	76.6	0.0	70.3
	Priaxor	8	V5	0.0	57.2	0.0	68.1
	TopGuard	14	V5	0.0	75.3	0.0	68.4
	Topsin	20	V5	1.3	74.9	0.0	71.3
	Quadris	15.5	V5	0.0	73.3	0.0	71.6
	Priaxor	8	R1	0.0	73.3	0.0	69.0
	TopGuard	14	R1	0.0	76.7	1.7	72.6
	Topsin	20	R1	0.0	75.4	0.0	68.3
	Quadris	15.5	R1	0.0	78.3	0.0	62.9
	Priaxor	8	R3	0.0	77.0	0.0	70.6
	TopGuard	14	R3	0.0	84.3	1.7	69.5
	Topsin	20	R3	1.3	80.0	0.0	69.8
	Quadris	15.5	R3	0.0	76.7	0.0	67.3
<b>LSD<sup>2</sup></b>				<b>22.6</b>	<b>14.1</b>	<b>22.7</b>	<b>9.6</b>

<sup>2</sup>Least significant difference (LSD) used to compare values within a column (95% confidence).