Oklahoma Soybean Board Report - 2007 Crop Year

Title: Response of soybeans to fungicide programs for control of soybean rust
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Objective: The objective was to determine the disease and yield responses of early and full-season soybean to fungicide programs for control of soybean rust. Field plots consisting of an early maturing variety (MG3) and a full season variety (MG5) were planted in irrigated and dryland locations at the OSU Research Station in Bixby. Each of the fungicides registered for control of soybean rust was applied once at the R3 (first pod) growth stage.

Results: In the early-season soybean trials planted in April, soybean rust was not detected until 7 Aug at the R6 (full pod) growth stage. Rust did not increase in either the dryland or irrigated early-season trials and there was not enough rust in either trial to evaluate. Brown spot (Septoria) was the predominant foliar disease in these trials and contributed to moderate levels of leaf drop (defoliation) at R6 (Table 1). Several fungicides reduced defoliation in the dryland trial, but none were effective in the irrigated trial. None of the fungicide treatments increased yield in either the irrigated or dryland trials (Table 1).

Table 1. Response of early-season soybeans (AG3905RR) to fungicide programs for control of soybean rust, 2007.

Treatment and rate/A[1]	Defoliation (%)[2]		Yield (bu/A)	
	Dryland	Irrigated	Dryland	Irrigated
Check	48 a	62 a	26.1 a	34.3 a
Headline 2.08E 6 fl oz	25 cd	54 a	27.0 a	40.5 a
Domark 230ME 4.0 fl oz	40 ab	56 a	24.6 a	37.7 a
Headline 2.08E 3.6 fl oz + Caramba 0.75SL 6 fl oz	21 d	54 a	28.8 a	38.4 a
Tilt 3.6E 6.0 fl oz	42 ab	55 a	27.0 a	35.6 a
Laredo EC 6 fl oz	41 ab	61 a	25.6 a	35.8 a
QuadrisXtra 2.34F 6.8 fl oz	35 bc	53 a	29.4 a	39.8 a
Alto 0.83F 5.5 fl oz	35 bc	62 a	25.7 a	37.4 a
Stratego 2.08E 8.0 fl oz	37 b	62 a	26.6 a	36.0 a
Folicur 3.6F 4 fl oz	42 ab	56 a	23.4 a	37.2 a
$LSD_{0.05}$ [4]	11	NS	NS	NS

[1] All treatments were applied once at the R3 (first pod) growth stage.
[2] Percentage of leaves defoliated at the R6 (full pod) growth stage on 7 Aug.
[3] Fisher's least significant difference, NS=treatment effect not significant at P=0.05.

Soybean rust was first detected in the full-season trials on 10 Oct at the R6 (full pod) growth stage. The disease appeared in the untreated check one month after the treatments were applied on 6 Sep. At the R7 (early maturity) growth stage on 25 Oct, the disease was present on nearly all leaves in untreated check plots, but only a low level of leaf area was affected. The disease reached higher levels in the irrigated trial (Table 2) than in the dryland trial (Table 3) which had higher levels of brown spot. Except for Tilt in the irrigated trial and Headline in the dryland trial, all fungicide treatments reduced rust compared to the untreated check plots. The triazole fungicides Domark, Folicur, and Alto; and the pre-mix fungicide (strobilurin+triazole) QuadrisXtra gave the best rust control. Because rust developed during the late stages of crop development, yield did not differ among treatments in either the irrigated or dryland trials.

Table 2. Control of soybean rust on irrigated full-season (Stauffer 4550NRS) soybeans, 2007.

Treatment and rate/A[1]	Leaves w/ rust (%)	Leaf area w/ rust (%)	Defolia-tion (%)	Yield (bu/A)
Check	95 a[2]	11.925 a	69 ab	46.5 a
Headline 2.08E 6 fl oz	65 b	0.140 b	35 e	50.5 a
Domark 1.9E 4 fl oz	0 d	0.000 b	63 abc	44.9 a
Headline 2.08E 3.6 fl oz + Caramba 0.75SL 6 fl oz	10 cd	0.010 b	41 e	45.8 a
Tilt 3.6E 6 fl oz	82 ab	0.343 b	52 b-e	46.0 a
Laredo 2E 6 fl oz	12 cd	0.013 b	61 a-d	50.2 a
QuadrisXtra 2.34F 6.8 fl oz	2 cd	0.003 b	45 de	49.8 a
Alto 0.83F 5.5 fl oz	7 cd	0.008 b	74 a	47.7 a
Punch 3.3E 4 fl oz	22 c	0.023 b	50 cde	49.1 a
Folicur 3.6F 4 fl oz	10 cd	0.010 b	62 a-d	47.5 a
LSD (*P*=0.05)[3]	22	6.111	18	NS

[1] All treatments were applied once at the R3 (first pod) growth stage.
[2] Values in a column followed by the same letter are not statistically different.
[3] Least significant difference, NS= treatment effect not statistically different.

Table 3. Control of soybean rust on dryland full-season (Stauffer 4550NRS) soybeans, 2007.

Treatment and rate/A[1]	Leaves w/ rust (%)	Leaf area w/ rust (%)	Brown spot (%)	Defolia-tion (%)	Yield (bu/A)
Control	90 a[2]	0.735 a	56 a	100 a	25.4 a
Headline 2.08E 6 fl oz	80 a	0.105 b	30 cd	75 b	26.1 a
Domark 1.9E 4 fl oz	2 d	0.002 b	38 bc	96 a	27.6 a
Headline 2.08E 3.6 fl oz + Caramba 0.75SL 6 fl oz	7 cd	0.007 b	24 d	70 b	24.7 a
Tilt 3.6E 6 fl oz	35 b	0.050 b	54 a	99 a	26.0 a
Laredo 2E 6 fl oz	25 bcd	0.025 b	56 a	98 a	24.0 a
QuadrisXtra 2.34F 6.8 fl oz	5 cd	0.005 b	37 bcd	97 a	26.1 a
Alto 0.83F 5.5 fl oz	0 d	0.000 b	45 ab	98 a	25.2 a
Punch 3.3E 4 fl oz	30 bc	0.030 b	56 a	100 a	22.4 a
Folicur 3.6F 4 fl oz	0 d	0.000 b	46 ab	99 a	23.6 a
LSD (*P*=0.05)[3]	26	0.330	14	9	NS

[1] All treatments were applied at the R3 (first pod) growth stage.
[2] Values in a column followed by the same letter are not significantly different at *P*=0.05.
[3] Least significant difference, NS=treatment effect not significant at P=0.05.