

Evaluation of Soybean Fungicides

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Introduction

Prior to the 2005 growing season, management of foliar diseases of soybean was not considered in Iowa or in much of the Midwest. However, with the introduction of Asian soybean rust caused by *Phakopsora pachyrhizi* to the United States, fungicide applications may become an additional but necessary part of midwestern soybean production. This report details the efficacy of fungicides registered for use against Asian soybean rust on fungal foliar diseases of soybean.

Material and Methods

In 2005, Mycogen 5N327RR soybeans were planted (160,000 ppa) at Crawfordsville on April 20, 2005. Tillage was fall chisel plowing and disk/field cultivation before planting. Plots measured four rows by 30 ft with unsprayed border around each plot. Rows in plots were 30 in. apart. A randomized complete block design with four replications of each of 38 treatments was used. Treatment details are given in Table 1. All treatments were compared with an unsprayed control. The middle four rows of each plot (5 ft × 28 ft long) were mechanically harvested on September 23, 2005. Plot yields (bu/acre) and the severity (%) of brown spot and frogeye leaf spot were recorded.

Results and Discussion

Foliar diseases observed included bacterial blight, brown spot, and frogeye leaf spot. The severity of brown spot and frogeye leaf spot for each treatment were assessed (Table 1). Brown spot severity was low and ranged from 5 to 10% among the treatments. No differences between the unsprayed control and various treatments were observed. Although frogeye severity was relatively low (0–20%), fungicide differences did significantly reduce disease severity with the exception of Heads Up and Folicur (4 oz/ac) applied at growth stages R1 and R5. Phytotoxicity was observed in ten of the treatments. This was traced back to the application of tebuconazole or metconazole applied at growth stage R3. It is probable that the hot, dry conditions that occurred at the time of application predisposed the soybeans to the damage. The yield of the treatments varied from 56.273 to 72.765 bushels/acre; however, no statistical difference among the yields of all treatments could be demonstrated.

It is anticipated that the experiment will be repeated in the coming seasons, or at least until we know if Asian soybean rust will be a frequent production risk to Iowa soybean growers.

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Table 1. Evaluation of fungicides registered for use against Asian soybean rust, brown spot, and frogeye leaf spot during 2005 at Crawfordsville.

Treatments	Application rate (oz/acre)	Timing	Final disease severity (%)		Phytotoxicity	Yield (bu/acre)
			Brown spot	Frogeye leaf spot		
DOMARK	5	R3	6.25	7.25 bcd	0 c	63.298
DOMARK + DOMARK	3 + 3	R1 + R5	8.75	1.75 ef	0 c	67.26
DOMARK + DOMARK	4 + 4	R1 + R5	6.25	5.0 bcdef	0 c	66.323
LAREDO / LAREDO + HEADLINE	7/5 + 6	R1 + 21 days later	6.25	3.75 bcdef	0 c	68.13
LAREDO + LAREDO	7 + 7	R1 + 21 days later	7.50	3.5 bcdef	0 c	69.838
PUNCH	4	R3	8.75	8.0 bc	0 c	60.933
CHARISMA	10	R3	5.50	5.5 bcdef	0 c	61.755
PUNCH + PUNCH	4 + 4	R1 + 21 days later	5.50	0.0 f	0 c	72.675
CHARISMA + CHARISMA	10 + 10	R1 + 22 days later	5.50	1.0 f	0 c	67.71
PUNCH + CHARISMA	4 + 10	R1 + 23 days later	6.25	1.75 ef	0 c	63.545
FOLICUR	4	R3	6.25	4.25 bcdef	18.75 a	64.305
HEADLINE	6	R3	7.50	3.0 cdef	0 c	66.423
ECHO + ECHO	20 + 20	V5 + R3	7.50	1.75 ef	0 c	63.483
ECHO + FOLICUR	20 + 4	V5 + R3	3.50	3.5 bcdef	16.25 a	64.91
IMPACT + IMPACT	7 + 7	R1 + 18-20 days later	6.25	5.0 bcdef	1.25 c	59.773
IMPACT + IMPACT	7 + 7	R1 + 28 days later	6.25	2.25 def	0 c	69.018
FOLICUR + STRATEGO	4 + 7	R1 + R3	4.75	3.0 cdef	0 c	64.11
FOLICUR + STRATEGO	4 + 10	R1 + R3	6.25	4.25 bcdef	0 c	69.323
STRATEGO + FOLICUR	7 + 4	R1 R3	5.00	3.75 bcdef	16.25 a	67.528
STRATEGO + FOLICUR (IF RUST)	7 + 4	R1 + <=10% rust	7.50	3.0 cdef	0 c	70.688
USF2010 + USF2010	5 + 5	R1 + R3	5.50	2.25 def	11.25 b	60.073
FOLICUR + FOLICUR	4 + 4	R1 + R5	7.50	15.0 a	0 c	67.508
FOLICUR + STRATEGO	4 + 10	<=10% rust <=10% rust +	8.75	6.25 bcdef	0 c	68.903
FOLICUR + FOLICUR	4 + 4	7-10 days later	7.50	7.5 bcd	0 c	64.343
A12910	4	R3	6.25	8.75 b	0 c	63.58
QUILT	14	R3	4.25	4.25 bcdef	2.5 c	63.355
A9901-QUADRIS EXTRA	1.03	R3	5.00	6.75 bcde	0 c	64.823
TILT	4	R3	7.50	4.25 bcdef	0 c	66.208
CARAMBA + CARAMBA	9.6 + 9.6	R1 + 21 days later	8.75	8.75 b	7.5 b	63.488
CARAMBA + HEADLINE / CARABMA + HEADLINE	7.68 + 4.43/7.68 + 4.43	R1 + 21 days later	7.50	2.25 def	1.25 c	69.69
CARAMBA + HEADLINE / CARABMA + HEADLINE	9.6 + 4.29/9.6 + 4.29	R1 + 21 days later	6.75	3.0 cdef	0 c	71.815
HEADLINE + FOLICUR / HEADLINE + FOLICUR	4.71 + 3.16/4.71 + 3.16	R1 + 21 days later	3.50	1.5 ef	0 c	70.733
HEADLINE / HEADLINE + FOLICUR	6.14/4.71 + 3.16	R1 + 21 days later	4.25	6.75 bcde	1.25 c	71.065
HEADLINE / HEADLINE + CARAMBA	6.14/4.43 + 7.68	R1 + 21 days later	5.00	1.25 f	1.25 c	70.728
FOLICUR + FOLICUR	3.56 + 3.56	R1 + 21 days later	6.25	3.0 cdef	0 c	70.103
DITHANE	2.5 lbs/ac	R5	7.50	4.25 bcdef	0 c	56.273
HEADS UP	1g/L of spray	1st true leaves	8.75	15.0 a	0 c	64.815
UNTREATED Control	-	-	10.00	20.0 a	0 c	65.26

¹Means sharing a common letter do not differ significantly according to the Waller-Duncan t test (P<0.05).