SOYBEAN (*Glycine max* 'Prima 2000')
Soybean Rust; *Phakopsora pachyrhizi*

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Evaluations of fungicides for control of soybean rust in the cultivar 'Prima 2000' near Cedara, South Africa, 2004-05.

Soybeans were planted 14 Nov 04 near Cedara (29°32'S, 30°17'E) at an altitude of 3500 ft, KwaZulu-Natal, South Africa. A medium season cultivar, Prima 2000, was mechanically planted at a row spacing of 15-in. and a plant population of 110,000 plants/A. Standard fertilizer, herbicide and insecticide practices were followed. Flumetsulam/s-metolachlor (23 fl oz/A), s-metolachlor (5.1 fl oz/A) and lambda-cyhalothrin (1.7 fl oz/A) were sprayed using a backpack sprayer applying 25 gal/A. The trial was inoculated twice, 90 and 97 days after planting (DAP), by stapling green infected leaves to the border rows of the plots. The experimental design was a split plot with four replications. The main effects were fungicide treatment, i. e. product and rates, with 2-application and 3-application programs as the subplots. Plots were 8 rows wide, with 4 rows receiving the fungicide applications. The two center rows of each plot were harvested, with a harvest length of 16 ft. Fungicides were applied with a battery-operated-pressured backpack sprayer, Lurmark hollow cone ceramic (ATR80), with a horizontal spray-boom with two nozzles spaced 20 in. apart. Full cover sprays of 20 gal/A at 3 bar pressure was applied row. The first application was made at growth stage R1, 69 DAP, with subsequent applications 22 days apart. Soybean rust was rated as a percentage of leaf area affected within the center two rows of each plot on each date of evaluation and used to produce an area under disease progress curve (AUDPC). Data were not transformed since preliminary analysis indicated it was not warranted. Plots were harvested 157 DAP on 21 Apr 05, and yields were calculated as bu/A at 13% moisture.

Soybean rust was first observed in the plots 93 DAP, after the second fungicide application had been applied, thus all treatments were applied as a protectant. There were significant differences among the treatments for AUPDC, 1000 seed weights and yield. All fungicide treatments had significantly lower disease severity and greater 1000 seed weights than unprotected control. All fungicides had greater yields than the unprotected control, but the four treatments with the lowest yields were not significantly different from the control. Nineteen of 22 treatments did not differ from the highest yielding treatments. There were no differences between the means of the 2-application and 3-application programs for 1000 seed weights or yield but there was a significant difference for AUDPC, the 2-application program had a higher AUDPC than the 3-application program. The fungicide treatment by application program interaction was not significant for AUDPC, 1000 seed weights or yield. No phytotoxicity was observed in any treatments but there was damage due to the herbicide that was not recorded.

	Soybean rust severity (AUDPC)[z]			1000 seed weight (g)			Yield (bu/A)		
	Application program			Application program			Application program		
Fungicide, rate per acre	2	3	Mean[y]	2	3	Mean[y]	2	3	Mean[y]
Folicur 3.6F, 3 fl oz	573	560	567 EFG	164	177	171 ABCDE	58.7	59.6	59.2 A
Headline 250EC, 9.2 fl oz[x]	667	641	654 BCD	179	181	180 A	58.2	58.4	58.3 A
Caramba 90SL, 8.2 fl oz	584	551	568 EFG	182	181	181 A	58.6	55.4	57.0 AB
Caramba 90SL + Headline 250EC, 9.2 + 4.1 fl oz	534	557	545 FGH	170	182	176 ABC	52.8	60.0	56.4 ABC
SA 120 201EC, 6.9 fl oz	560	520	540 FGH	178	170	174 ABC	59.2	52.8	56.0 ABC
Caramba 90SL + Headline 250EC, 8.2 + 4.8 fl oz	521	481	501 GH	177	180	178 A	60.9	50.8	55.9 ABC
Quilt 200SE, 13.7 oz[x]	680	662	671 BCD	167	174	170 ABCD	55.3	55.9	55.6 ABC
Tilt 250EC, 7 oz	674	632	653 BCD	177	168	173 ABC	55.3	55.2	55.3 ABC
Quadris Xtra 280SC, 4.1 oz[x]	490	500	495 GH	177	175	176 AB	53.8	56.6	55.2 ABC
Punch EC, 3 fl oz	564	530	547 FGH	177	173	175 ABC	53.9	53.9	53.9 ABC
Domark 230ME, 5.1 fl oz	586	541	563 EFG	171	182	176 AB	53.4	54.2	53.8 ABC
Punch EC, 4.3 fl oz	560	530	545 FGH	174	182	178 A	60.0	47.3	53.6 ABC
Caramba 90SL + Headline 250EC, 7.8 + 3.6 fl oz	537	424	481 H	167	181	174 ABC	54.2	52.3	53.2 ABC
Stratego 250EC, 8.4 fl oz[x]	567	591	579 DEFGH	186	169	177 ABC	42.5	63.8	53.2 ABC
Caramba 90SL +Headline 250EC, 6.1 + 3.6 fl oz	588	541	564 EFG	178	181	180 A	53.3	51.4	52.4 ABC
Impact 125SC, 6.9 fl oz	550	510	530 GH	166	176	171 ABCD	55.7	49.0	52.4 ABC
Folicur 3.6F, 4 fl oz	565	540	552 EFGH	169	172	171 ABCD	54.8	48.4	51.6 ABC
Echo 720 F, 27.4 fl oz	773	629	701 BC	165	161	163 CDE	48.3	54.2	51.2 ABCD
Rubigan EC, 11 fl oz [x]	653	753	703 B	177	172	174 ABC	48.8	52.5	50.6 ABCD
Stratego 250EC, 12 fl oz[x]	674	579	627 CDE	159	169	164 BCDE	48.0	49.4	48.7 BCD
Tilt 250EC, 10 oz	627	586	607 DEF	162	176	169 ABCD	48.4	47.4	47.9 CD
No fungicide	943	1003	973 A	155	147	151 F	45.1	40.9	43.0 D
Application program mean[y]	627 x	603 x		171 x	173 x		48.3 x	49.2 x	

[z] Area under the disease progress curve.
[y] Significant differences between treatments when 2-application and 3-application data were combined, (p=0.05) means with the same letter are not significantly different by Students LSD
[x]. 0.125% NIS was included in the treatment.
[w] Differences between the means of the application programs were not significant by Students LSD (p=0.05).