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SYMPTOM RESPONSE OF SORGHUM HYBRIDS INFECTED BY SUGARCANE MOSAIC VIRUS STRAIN MDMV-B

D. L. Seifers and K. D. Kofoed

Fort Hays Branch Experiment Station

Sorghum [*Sorghum bicolor* (L.) Moench] infected by sugarcane mosaic virus strain MDMV-B (SCMV-MDMV-B) (formerly maize dwarf mosaic virus strain B) expresses variable symptoms depending on plant genotype and temperature. Infection causes a yellow to dark green pattern (mosaic), and a necrotic reaction (red-leaf) develops on certain genotypes when the temperature drops below 21°C (69°F). Hybrids expressing the red-leaf symptom show greater reduction in yield. Immunity to SCMV-MDMV-B is not present in commercially available hybrid sorghums.

Procedure

Studies were conducted at the Fort Hays Branch Experiment Station to determine symptom response of sorghum hybrids infected by SCMV-MDMV-B both under field conditions (2 years of testing) and in growth chambers. Sorghum seed was planted in 6.1 m rows. When at the two- to three-leaf stage, plants in half of each row were inoculated, and plants in the remaining half of the

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Kansas State University, Manhattan
Marc A. Johnson, Director

row served as healthy controls. Plants were inoculated with a Devilbiss EGA-502 spray gun attached to a 3.5 L (1 gal) inoculum reservoir. Compressor line pressure was maintained at 7.0 kg/cm² (100 lbs/in²). Symptom notes were recorded at biweekly intervals during the growing season beginning 2 weeks after inoculation. Planting was delayed until late June to assure cool temperatures for induction of red-leaf necrosis.

In growth chamber tests, sorghum hybrids were planted in metal flats with 15 seeds/entry and 33 entries/flat. Seedlings were inoculated at the two-leaf stage (on second leaf) with a Devilbiss atomizer at the same pressure used for field inoculations. Inoculated plants were maintained in growth chambers at 27 ± 2°C (80 ± 2°F) with 14 hr of fluorescent light. Control plants, inoculated with buffer and abrasive only, were maintained in the same environment. The presence of mosaic symptoms was recorded 14 days following inoculation. The temperature of the growth chambers then was decreased to 15°C (59°F). Four days later, plants were rated for the presence of red-leaf necrosis. Growth chamber tests were conducted once.

Results

Reactions of hybrids are shown in Table 1. SS = inoculated leaf and two to three leaves above the inoculated leaf have necrotic streaks and spots that often coalesce and cover 1–25 percent of a leaf. New leaves above these show few or no symptoms, so that at maturity, no symptoms of any type occur in the upper leaves. RL1 = seedling and juvenile plants have a necrotic red-leaf reaction consisting of various widths of streaks that often coalesce and cover 25–50 percent of a leaf. At maturity, the flag leaf and the subtending 3–4 leaves have a few necrotic streaks covering 1–10 percent of a leaf. RL2 = seedling and juvenile plants have a severe necrotic red-leaf reaction, not in streaks or spots, but continuous necrosis covering 80–100 percent of a leaf. In plants that survive to maturity, any new leaf will develop a like necrosis with onset of cool temperatures. M = plants having only a mosaic reaction. Current data indicate that plants with the M reaction suffer less yield loss than plants developing necrosis (RL types).

**Table 1. Reactions of Sorghum Hybrids to Infection by
Sugarcane Mosaic Virus Strain MDMV-B**

Brand	Hybrid	Symptom Response ^a
Agrigene	AG2470W	SS
Agrigene	AG2725	RL2
Agripro	AP 9250	SS
Agripro	AP 9830	SS
Agripro	AP 9850	M
Agripro	ST 686	M
Agripro	ST D701G	RL2
Asgrow	A504	SS
Asgrow	Madera	M
Asgrow	Osage	M
Asgrow	Seneca	M
Asgrow	Topaz	RL2
Cargill	1099	RL2
Cargill	575	SS
Cargill	607E	SS
Cargill	618Y	M
Cargill	630	SS
Cargill	837	SS
Cargill	847	M
Casterline	SR 305	M
Casterline	SR 314EC	RL2
Casterline	SR 315E	RL2
Casterline	SR 319E	RL2
Casterline	SR 324E	RL1
Dekalb	DK-39Y	RL2
Dekalb	DK-40Y	SS
Dekalb	DK-41Y	SS
Dekalb	DK-48	SS
Dekalb	DK-56	M
Dekalb	DK-66	RL2
Dekalb	M-572	RL2
Delange	DSA 117	M
Delange	DSA 121	SS
Delange	DSA 131	RL2
Delange	DSA 141C	SS
Delange	DSA 922	RL2
Deltapine	1506	RL2
Deltapine	G-1492	SS
Deltapine	G-1616	SS
Deltapine	G-550E	RL1
DyNA	DN 31	RL1
Fontanelle	5550	RL2
Fontanelle	5590	RL2
Fontanelle	W 5000	SS
Garrison	SG-651	SS
Garrison	SG-821	SS
Garrison	SG-942	RL2
Garst	5319	RL2
Garst	5392	M
Garst	5503	M
Garst	5511	RL2

Brand	Hybrid	Symptom Response ^a
Garst	5522Y	SS
Garst	5681	SS
Golden Acres	T-E 76	M
Golden Acres	T-E 77-E	RL2
Golden Acres	T-E Dinero	RL2
Golden Acres	T-E Eden	M
Golden Acres	T-E Rio	RL2
Golden Acres	T-E Wahoo	SS
Golden Acres	T-E Y-60	SS
Golden Acres	T-E Y-75	M
Golden Acres	T-E Y-101G	RL1
Golden Harvest	H-388W	SS
Golden Harvest	H-444W	SS
Golden Harvest	H-514B	RL2
Golden Harvest	H-515E	SS
GRI	890111	RL2
Groagri	GSC 3146	M
Groagri	GSC 3148	M
Groagri	GSC 3150	RL2
Groagri	GSC 3605	RL1
Hoegemeyer	6636	RL1
Hoegemeyer	671	SS
Hoegemeyer	6744	SS
Hoegemeyer	6878	RL2
Hoegemeyer	688	RL2
Horizon	200Y	SS
Horizon	213Y	SS
Horizon	216G	M
Horizon	76G	M
Hyperformer	1255 DR	RL2
Hyperformer	Honcho	RL2
Hyperformer	HSC 1289C	M
Hyperformer	HSC Cherokee	M
Jacques	211	M
Jacques	377-W	SS
Jacques	411	M
Jacques	606E	RL1
NC+	270	RL1
NC+	371	SS
NC+	472	SS
NC+	7B81	SS
NC+	7C49	SS
NC+	Y363	SS
Northrup-King	2656	RL2
Northrup-King	KS-383Y	SS
Northrup-King	KS-555Y	SS
Northrup-King	KS-710	RL2
Northrup-King	KS-714Y	SS
Northrup-King	KS-737	SS
Northrup-King	S-9740Y	SS
Northrup-King	S 9750	RL2

Brand	Hybrid	Symptom Response ^a
Ohlde	120C	SS
Ohlde	134	SS
Ohlde	139A	RL2
Ohlde	140W	SS
Ohlde	246y	RL1
Oro	Alpha	M
Oro	Amigo	RL2
Oro	Baron	M
Oro	Edge	M
Oro	G XTRA	RL2
Oro	Hombre	M
Oro	Ivory	SS
Oro	Ultra	RL2
Pioneer	8231Y	RL1
Pioneer	8260	SS
Pioneer	8358	RL1
Pioneer	8379	SS
Pioneer	8500	SS
Pioneer	8536Y	SS
Pioneer	8557Y	M
Pioneer	8601	RL1
Pioneer	8696Y	M
Pioneer	8699	M
Pioneer	8771	M
SSI	SBP001	RL1
SSI	SBP005	RL1
SSI	SBP011	SS
Stine	SM 68 BR	RL2
Stine	SM 69	M
Stine	SM 74	RL2
Stine	SM 75R	RL2
Terra	TR 4580	RL1
Terra	TR 4620	RL2
Terra	TR 4637Y	SS
Triumph	TR 46	M
Triumph	TR 50yG	M
Triumph	TR 58Y	SS
Triumph	TR 60-G	M
Triumph	TR 65-G+	RL1
Triumph	TR 74CR	SS
Triumph	TWO 64yG	RL2
Triumph	TWO 80-D	RL2
Warner	W-624-Y	RL2
Warner	W-625-Y	RL2
Warner	W-902-W	M
Warner	W-917-E	M
Wilson	515W	SS
Wilson	522W	SS
Wilson	535Y	RL2
Wilson	622E	M

^aSymptom responses are the same for both field and growth chamber tests.

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Agricultural Experiment Station
Kansas State University
Manhattan 66506-4008

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