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Disease Reaction of Sorghum Hybrids to Infection by Maize Dwarf Mosaic Virus Strains A and B

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Disease Reaction of Sorghum Hybrids to Infection by Maize Dwarf Mosaic Virus Strains A and B

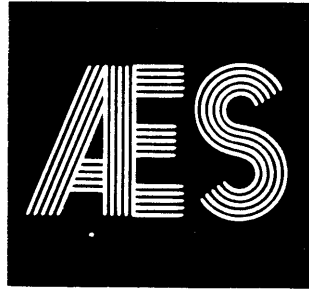
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Keeping
Up With
Research
90

October 1986

**Disease Reaction of Sorghum
Hybrids to Infection
by Maize Dwarf Mosaic Virus
Strains A and B**

**D. L. Seifers and Dave Karr
Fort Hays Branch Station**

Maize dwarf mosaic of sorghum, *Sorghum bicolor* (L.) Moench, is caused by maize dwarf mosaic virus (MDMV). Infection of sorghum by MDMV produces variable symptoms depending on virus strain, plant genotype, and temperature. Infection causes a yellow to dark green pattern (mosaic) and, on certain genotypes, a necrotic reaction (red-leaf) develops when the temperature drops below 21°C (69°F). Hybrids expressing the mosaic reaction when the temperature drops show less reduction in yield than plants with red-leaf symptoms. Immunity to MDMV is not present in commercially available hybrid sorghums.

Procedure

Studies were conducted at the Fort Hays Experiment Station. Sorghum hybrids were tested for MDMV-A disease reactions under both greenhouse and field conditions. Disease reaction to infection by MDMV-B was tested only in the greenhouse. In greenhouse tests, sorghum hybrids were planted in metal flats with 15 seeds/entry and 33 entries/flat. Seedlings were inoculated at the two-leaf stage with a Devilbiss atomizer (7.0 kg/cm²-100 lbs/in² air pressure). Inoculated

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Kansas State University, Manhattan
Walter R. Woods, Director

plants were maintained at $27 \pm 4^{\circ}\text{C}$ ($80 \pm 4^{\circ}\text{F}$) in the greenhouse. Control plants, inoculated with buffer and abrasive only, were maintained in the same environment.

The presence of mosaic symptoms was noted 14 days following inoculation. Test plants were then placed in a growth chamber at 15°C (59°F). Four days later, plants were returned to the greenhouse, and the presence of red-leaf symptoms was noted. Greenhouse tests were repeated three times.

Field-grown plants at the two- to three-leaf stage were inoculated with a Devilbiss EGA-502 spray gun attached to a 3.5L (1 gal) inoculum reservoir. Compressor line pressure was maintained at 7.0 kg/cm^2 (100 lbs/in^2). Notes on red-leaf development were recorded at weekly 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.

Results

Reactions of all hybrids tested are shown in the table.

Acknowledgements

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Disease Reaction of Sorghum Hybrids to Infection by Maize Dwarf Mosaic Virus Strains A and B

Brand	Hybrid	Disease Reaction		Brand	Hybrid	Disease Reaction	
		A ¹	B ²			A ¹	B ²
Agripro	TEK 1055R	M ³	RL ³	Fontanelle	5583	M	RL
Agripro	TEK 1094R	M	RL	Fontanelle	6651	M	RL
Asgrow	Bugoff	M	RL	Fontanelle	6652	M	RL
Asgrow	Chaparral	M	M	Funks	G-499GBR	M	RL
Asgrow	Colt	M	M	Funks	G-550	M	RL
Asgrow	Corral	M	RL	Funks	G-522A	M	RL
Asgrow	Mustang	M	RL	Funks	G-522DR	M	RL
Asgrow	Nugget	M	M	Funks	G-611	M	RL
Asgrow	Opal	M	RL	Funks	G-1400	M	RL
Asgrow	Sierra	M	M	Funks	G-1550	M	M
Asgrow	Topaz	M	RL	Funks	G-1660	M	RL
Asgrow	GS 712	M	RL	Funks	G-1711	M	RL
Asgrow	GS 75311	RL	RL	Garrison	SG-686	M	RL
Asgrow	H 8204	M	M	Garrison	SG-688	M	RL
Asgrow	H 8206	M	M	Garrison	SG-Y850R	M	RL
Asgrow	H 8208	M	M	Garrison	SG-922	M	RL
Cargill	30	M	RL	Garrison	SG-925	M	RL
Cargill	40	M	RL	Garrison	SG-932	M	RL
Cargill	55	RL	RL	Garst	5319	M	RL
Cargill	60	M	RL	Garst	5511	M	RL
Cargill	70	M	RL	Garst	5517	M	RL
Cargill	80	M	RL	Garst	5521	M	RL
Cargill	575	RL	RL	Garst	5525	—	RL
Casterline	SR 313	M	RL	Garst	5715	M	M
Casterline	SR 323	M	RL	Golden Acres	T-E Y-44R	M	M
Casterline	SR 325	M	RL	Golden Acres	T-E Y-45G	M	RL
Casterline	SR 327	M	RL	Golden Acres	T-E Y-60	RL	RL
Conlee	Pronto	M	RL	Golden Acres	T-E Y-75	M	M
Conlee	Rawhide	M	RL	Golden Acres	T-E Y-77	M	RL
Conlee	Tophand II	M	RL	Golden Acres	T-E Y-101G	M	RL
Corlee	Tophand TA	M	RL	Golden Acres	T-E Dinero	M	RL
Conlee	Wrangler	RL	RL	Golden Acres	T-E Dinero E	M	RL
Cross	C1-85A	M	RL	Golden Acres	T-E Tuff	M	M
Cross	C1-100A	M	RL	Golden Harvest	H-408B	M	RL
Cross	C1-112A	M	RL	Golden Harvest	H-505BW	RL	RL
Cross	C1-120A	M	RL	Golden Harvest	H-510B	M	RL
Cross	C1-125A	M	RL	Golden Harvest	H-514B	M	RL
Cross	C1-125R	M	RL	Gold Tag	475	M	RL
Cross	C1-303A	M	RL	Gold Tag	565	M	RL
Cross	C1-322A	M	RL	Gold Tag	585	M	RL
Cross	C1-330A	M	RL	Growers	GSA 1180	M	M
Cross	C1-300D	M	RL	Growers	GSA 1212	M	RL
Cross	C1-344A	M	RL	Growers	GSA 1310A	M	RL
DeKalb	DK-18	RL	—	Growers	GSC 1188	M	RL
DeKalb	DK-28	RL	—	Growers	GSC 1299	M	M
DeKalb	DK-38	M	RL	Growers	GSC 1313	M	M
DeKalb	DK-39Y	M	RL	Growers	GSC 1443W	—	RL
DeKalb	DK-41Y	M	RL	Hoegemeyer	GT 622	M	RL
DeKalb	DK-42Y	M	RL	Hoegemeyer	GT 657	M	RL
DeKalb	DK-46	M	M	Hoegemeyer	GT 662	—	RL
DeKalb	DK-58	M	RL	Hoegemeyer	GT 665Y	M	RL
DeKalb	DK-59E	M	RL	Hoegemeyer	GT 679	M	RL
DeKalb	DK-61	RL	RL	Hoegemeyer	GT 688	M	RL
DeKalb	DK-64	RL	RL	Horizon	101G	M	RL
DeKalb	DK-69	M	RL	Horizon	104G	RL	RL
Delange	DS-A121	M	RL	Horizon	114G	M	RL
Delange	DS-A131	M	RL	Jacques	308	M	RL
Delange	DS-A143W	M	RL	Jacques	377W	RL	RL
Delange	DS-G686	M	RL	Jacques	397W	RL	RL
Delange	DS-G922	M	RL	Jacques	404	M	RL
Delange	DS-G932	M	RL	Jacques	408	M	RL
Farm Bureau	FB 145	M	RL	Jacques	505	M	RL
Farm Bureau	FB 155A	M	RL	Jacques	606	M	RL
Farm Bureau	FB 301	M	RL	Keltgen	KG 57T	M	M
Farm Bureau	FB 301A	M	RL	Keltgen	KG 60T	M	M
Farm Bureau	FB 601	M	RL	Keltgen	KG 63T	M	RL
Farm Bureau	FB 611	M	RL	Keltgen	KG 64T	M	RL
Fontanelle	2233	M	M	Keltgen	KG 70B	RL	RL
Fontanelle	3345	M	RL	Keltgen	KG 70T	M	RL
Fontanelle	4455	M	RL	Keltgen	KG 71D	M	RL
Fontanelle	5546	M	RL	Keltgen	KG 72D	M	RL

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Brand	Hybrid	Disease Reaction		Brand	Hybrid	Disease Reaction	
		A ¹	B ²			A ¹	B ²
Keltgen	KG 75T	RL	RL ³	Pioneer	8501	M	M
Lynks	555GBT	M ¹	RL	Pioneer	8515	M	RL
Lynks	595GBT	M	RL	Pioneer	8585	M	M
Lynks	600GBT	M	RL	Pioneer	8680	M	M
McCurdy	M51YG	M	RL	Pioneer	8790	M	M
McCurdy	M57YG	RL	RL	Pioneer	8855	M	M
McCurdy	M637	M	RL	Ring Around	RA 433A	M	M
McCurdy	M687	M	M	Ring Around	RA 787	RL	RL
McCurdy	M737	M	M	Ring Around	RA 808	RL	RL
McCurdy	M747	M	RL	RS	610	M	RL
MFA	GS10	M	RL	Seed Tec/WAC	652G	M	RL
MFA	GS103	M	M	Seed Tec/WAC	672G	M	RL
MFA	GS301A	M	RL	Seed Tec/WAC	694G	RL	RL
MFA	GS384	RL	RL	Seed Tec/WAC	D701 G	M	RL
NC+	157	RL	RL	Seed Tec/WAC	710 DR	M	RL
NC+	160	M	RL	Seed Tec/WAC	716 DR	M	RL
NC+	163	M	RL	Seed Tec/WAC	1002	M	M
NC+	165	RL	RL	Stauffer	530G	M	RL
NC+	172	M	RL	Stauffer	535G	M	RL
NC+	174	M	RL	Stauffer	657Y	M	RL
NC+	178	M	RL	Stauffer	677G	RL	RL
NC+	271	RL	RL	Stauffer	708G	M	RL
Northrup King	1580	M	M	Stauffer	734G	M	RL
Northrup King	2030	M	M	Stauffer	S9533G	M	RL
Northrup King	2244	M	RL	Stauffer	S9736	M	RL
Northrup King	2456Y	M	RL	Stauffer	S9740Y	RL	RL
Northrup King	2656	M	RL	Stauffer	S9750	M	RL
Northrup King	2660	M	RL	Terra	HT 45G	M	RL
Northrup King	2665	M	RL	Terra	HT 124	M	RL
Northrup King	2778	M	RL	Terra	HT 125G	M	RL
Northrup King	2779	M	RL	Terra	HT 126DR	M	RL
OHLDE	GS134	M	RL	Terra	HT 128DR	M	RL
OHLDE	GS138	M	RL	Triumph	TWO 54YG	M	RL
OHLDE	GS139	M	RL	Triumph	TWO 64YG	M	RL
ORO	E ORO XTRA	M	M	Triumph	TWO 70-D	M	RL
ORO	G XTRA	M	RL	Triumph	TWO 80-D	M	RL
ORO	Pronto	M	RL	Warner	W-628	RL	RL
O's Gold	GS 709	M	RL	Warner	W-628DR	M	RL
O's Gold	GS 712	M	RL	Warner	W-630DR	M	M
O's Gold	GS 5100	M	RL	Warner	W-655T	M	RL
PAG	2285	M	M	Warner	W-685DR	M	RL
PAG	3339	M	RL	Warner	W-839A	M	RL
PAG	3385	M	RL	Warner	W-839DR	M	RL
PAG	4462	RL	RL	Warner	W-851A	M	RL
PAG	5514	M	RL	Warner	W-851DR	M	RL
PAG	5572	M	RL	Warner	W-864T	M	RL
PAG	5665	M	RL	Warner	W-866DR	M	M
PAG	6670	M	RL	Warner	W-876DR	M	RL
Paymaster	1022	M	RL	Weather Master	GS 56 YGR	M	RL
Paymaster	1091	M	RL	Weather Master	GS 61 YGR	M	RL
Paymaster	1099	M	RL	Weather Master	GS 66 YGR	RL	RL
Paymaster	DR1125	M	RL	Wilson	614 G	M	RL
Paymaster	1195	M	RL	Wilson	617 G	M	RL
Pioneer	8222	M	RL	Wilson	619 GX	M	RL
Pioneer	8300	RL	RL	Wilson	621 G	M	RL
Pioneer	8333	RL	RL	Wilson	623 T	M	RL
Pioneer	8493	M	M				

¹Disease reactions are the same for both field and greenhouse tests

²Disease reactions based on greenhouse tests

³M=Mosaic RL=Red Leaf

Agricultural Experiment Station, Manhattan 66506



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