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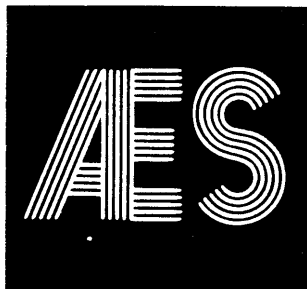
# Disease Reaction of Sorghum Hybrids to Infection by Maize Dwarf Mosaic Virus Strains A and B

## **Keywords**

Keeping up with research; SRL 142 (Sept. 2011); Sorghum; Hybrids; Maize dwarf mosaic virus; Disease reaction

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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/cm<sup>2</sup>-100 lbs/in<sup>2</sup> 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  $15^{\circ}\text{C}$  ( $59^{\circ}\text{F}$ ). 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  $7.0 \text{ kg/cm}^2$  ( $100 \text{ lbs/in}^2$ ). 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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KAES Contribution 87-78-S

**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 <sup>1</sup>   | B <sup>2</sup>  |                |              | A <sup>1</sup>   | B <sup>2</sup> |
| Agripro     | TEK 1055R  | M <sup>3</sup>   | RL <sup>3</sup> | 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 <sup>1</sup>   | B <sup>2</sup>  |                |           | A <sup>1</sup>   | B <sup>2</sup> |
| Keltgen       | KG 75T     | RL               | RL <sup>3</sup> | Pioneer        | 8501      | M                | M              |
| Lynks         | 555GBT     | M <sup>1</sup>   | 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               |                |           |                  |                |

<sup>1</sup>Disease reactions are the same for both field and greenhouse tests

<sup>2</sup>Disease reactions based on greenhouse tests

<sup>3</sup>M=Mosaic RL=Red Leaf

**Agricultural Experiment Station, Manhattan 66506**



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