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

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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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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/cm<sup>2</sup> (100 lbs/in<sup>2</sup>). 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 <sup>a</sup> |
|------------|----------|-------------------------------|
| 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 <sup>a</sup> |
|----------------|--------------|-------------------------------|
| 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 <sup>a</sup> |
|---------|----------|-------------------------------|
| 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                             |

<sup>a</sup>Symptom responses are the same for both field and growth chamber tests.

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