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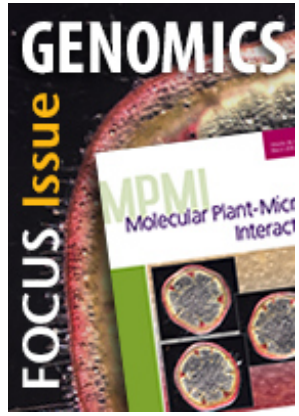
Disease Notes

First Report of Transmission of *Soybean mosaic virus* and *Alfalfa mosaic virus* by *Aphis glycines* in the New World

J. H. Hill, Department of Plant Pathology, Iowa State University, Ames 50011; **R. Alleman**

and **D. B. Hogg**, Department of Entomology, University of Wisconsin, Madison 53706; and **C. R. Grau**, Department of Plant Pathology, University of Wisconsin, Madison 53706



The recent discovery of the soybean aphid, *Aphis glycines* Matsamura, in the North Central region of the United States is significant because it is the first time that a soybean-colonizing aphid has been detected in the New World. Although the aphid has the potential to cause physiological loss of up to 52% on soybeans (4), it can also transmit *Soybean mosaic virus* (SMV). Transmission of *Alfalfa mosaic virus* (AMV) has not been reported. SMV, and less commonly AMV, are found in soybeans in the North Central states and are transmitted by numerous aphids in a nonpersistent manner (2; Grau, *unpublished*). For SMV, potential exists for specificity of transmission between virus strain and aphid species (3). For these reasons, it was important to determine if an endemic isolate of these viruses could be transmitted by this introduced species of aphid in the North Central region. Transmission experiments were conducted as described (3), using 3, 5, and 10 aphids per plant. Ten plants of the soybean cultivar Williams 82 were used for each treatment. To preclude confounding results by possible seed transmission, plants used in all tests were grown from seeds harvested from virus-indexed plants grown in the greenhouse. For experiments involving SMV, the aphid-transmissible field isolate Al5 (GeneBank Accession no. AF242844) and, as a negative control, the non-aphid transmissible isolate N (GeneBank Accession no. D500507) were used. For experiments involving AMV, a field isolate of AMV, confirmed by ELISA and host range, was used. The aphid species *Myzus persicae* was maintained on broad bean and *A. glycines* was maintained on virus-free soybean. The protocol for transmission studies of AMV was identical to that used in the SMV study, except only *A. glycines* was tested. For experiments, plants were periodically observed for symptom development and tested by ELISA 4 to 5 weeks after inoculation access. No transmission of SMV-N occurred in any tests, which together involved 180 aphids each of *M. persicae* or *A. glycines*. For the Al5 isolate, transmission efficiencies of 30, 50, and 50% were obtained with 3, 5, and 10 individuals, respectively, of *M. persicae* per plant. Efficiencies for *A. glycines* were 30, 40, and 40%. Transmission levels by the two aphid species did not differ significantly (*t*-test, $P = 0.01$). For AMV, corresponding transmission efficiencies were 0, 0, and 20%. The data suggest that the introduced *A. glycines* can be an efficient vector of SMV, but a less efficient vector of AMV, in the North Central region.

Transmission of AMV by *M. persicae* has been documented (1) but was not examined in this study. Transmission of SMV and AMV by *A. glycines* is of concern because it may increase SMV and AMV incidence. With the recent outbreak of *Bean pod mottle virus* (BPMV) in the region, the potential for synergism of SMV and BPMV is increased (2).

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