

Barley Yellow Dwarf Disease in Natural Populations of Dominant Tallgrass Prairie Species in Kansas

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The grasses *Sorghastrum nutans* (Indian grass), *Schizachyrium scoparium* (little bluestem), *Panicum virgatum* (switchgrass), and *Andropogon gerardii* (big bluestem) are four of the most common plant species present in a tallgrass prairie (1). Infection with *barley yellow dwarf virus* (BYDV, family *Luteoviridae*) is of interest in these species because of the potential effects of the virus on tallgrass prairie plant communities and the potential for tallgrass prairie to function as a reservoir of the virus for infection in wheat or barley fields. In a previous inoculation experiment, an unidentified strain of BYDV transmitted by the aphid species *Rhopalosiphum padi* was reported to infect *S. scoparium* but none of the other three grass species (2). We sampled for the presence of five virus strains in at least 50 blooming plants of each grass species in a natural tallgrass prairie stand in August 2000. Samples were collected in watersheds that were designated 1B, 1D, K1A, 20B, and 20C at Konza Prairie Biological Station in the Flint Hills near Manhattan, KS. To detect the virus, we used enzyme-linked immunosorbent assay (ELISA) with antibodies purchased from Agdia (Elkhart, IN). For the PAV, MAV, RMV, and SGV strains, we used double-antibody sandwich ELISA with alkaline phosphatase label. For *Cereal yellow dwarf virus* (RPV), we used compound direct ELISA with alkaline phosphatase label. The scoring of ELISA results was based on comparison with infected and uninfected control plants of the same species. Symptoms of infection in the field were difficult to interpret visually, since plants in this natural environment often showed multiple symptoms of stress. None of the five strains were detected in 51 individuals of *S. nutans*. For 50 individuals of *S. scoparium*, the incidence of infection by the different strains was 4% for MAV, 0% for PAV, 2% for RMV, 0% for RPV, and 58% for SGV. For 51 individuals of *P. virgatum*, the incidence of infection was 31% for MAV, 0% for PAV, 0% for RMV, 0% for RPV, and 4% for SGV. For 64 individuals of *A. gerardii*, the incidence of infection was 59% for MAV, 0% for PAV, 0% for RMV, 0% for RPV, and 3% for SGV. The impact of BYDV on these tallgrass prairie species

remains to be determined. The PAV strain is the most commonly reported strain in wheat in Kansas but was not recovered from these grass species.

References: (1) C. C. Freeman. The flora of Konza Prairie: A historical review and contemporary patterns. Pages 69–80 in: Grassland Dynamics. A. K. Knapp et al., eds. Oxford, 1998. (2) W. N. Stoner. Plant Dis. Rep. 60:593, 1976.