Peanut Stunt Virus in Arkansas

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ABSTRACT

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Peanut stunt virus (PSV) was found in beans in a breeding nursery in Fayetteville, AR, and in white clover surrounding the bean and cowpea breeding nurseries. PSV was not recovered from white clover or other perennial plants from three other locations in Arkansas.

In 1979, there was a high incidence of stunting, mottling, and distortion of plants in a bean breeding nursery at Fayetteville (Washington County), AR, indicating a probable virus infection. A strain of peanut stunt virus (PSV) had been isolated previously from bean (*Phaseolus vulgaris* L.) in this nursery and an antiserum had been prepared (H. A. Scott and J. P. Fulton, *personal communication*). PSV is a stylet-borne, aphid-transmitted virus that has been reported to overwinter in white clover (*Trifolium repens* L.) (7). White clover was prevalent in areas around the bean nursery and a nearby cowpea (*Vigna unguiculata* (L.) Walp.) nursery. This study was conducted to determine whether PSV was involved in this bean disease and occurrence of this virus in Arkansas.

MATERIALS AND METHODS

During the summer of 1980, 40 bean plants in the Fayetteville breeding nursery with mild or severe mosaic were indexed for virus. The bioassays were conducted by triturating leaves in 0.01 M phosphate buffer, pH 7.0, and rubbing the sap on Carborundum-dusted leaves of Bountiful bean and Monarch cowpea. Virus isolates were tested serologically by the Ouchterlony gel diffusion technique with antisera to alfalfa mosaic virus (AMV), bean pod mottle virus (BPMV), cowpea chlorotic mottle virus (CCMV), cucumber mosaic virus (CMV), and PSV.

In a preliminary evaluation, four samples of white clover showing mottling or chlorosis were collected near the bean breeding nursery in March 1980. The samples were assayed on bean and cowpea. Virus isolates were identified in Ouchterlony gel diffusion tests with antisera to AMV, CCMV, CMV, PSV, and southern bean mosaic virus (SBMV).

During April 1980, several plant species from four locations in the state were indexed for virus using bean and cowpea. Two bulked white clover samples were collected at Kibler (Crawford County) near a cowpea breeding nursery. Four ladino clover (*T. repens* f. *giganteum* Lagr.-Foss) samples showing mottling were collected from clover breeding plots near established cowpea and soybean (*Glycine max* (L.) Merr.) plantings at Hope (Hempstead County). One lespedeza (*Lespedeza* sp.) and two white clover samples with no symptoms were collected from a pasture in Warren (Bradley County). Samples from Fayetteville included one vetch (*Vicia* sp.), one violet (*Viola* sp.), six white clover samples from the border of the bean breeding nursery, and one vetch and seven white clover samples from the border of a cowpea breeding nursery on the same farm. Only the white clover showed symptoms.

RESULTS

Virus was recovered on both bean and cowpea from seven of 40 bean plants selected from the breeding nursery. Two plants with mild mosaic symptoms and five stunted plants with severe mosaic symptoms yielded virus. All seven isolates reacted positively with PSV antiserum; none reacted with AMV, BPMV, CCMV, or CMV antisera.

All four white clover samples taken from the border of the bean breeding nursery in March yielded virus that produced systemic symptoms in cowpea. Three of the isolates reacted positively with PSV antiserum; none reacted with AMV, CMV, CCMV, or SBMV antisera. PSV was also recovered from 10 of 13 white clover samples collected in April near the bean and cowpea breeding nurseries at Fayetteville. PSV was not isolated from white or ladino clover from Kibler, Hope, or Warren, nor from lespedeza, vetch, or violet.

DISCUSSION

This is the first report of PSV in Arkansas. Although sampling was limited, it was found in white clover in one of four locations and in bean. PSV has previously been found in white clover in Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, and Virginia (1–3,6–8,12). Barnett and Gibson (1) found PSV in 14 of 19 white clover pastures in a survey of southeastern states. PSV has also been found in bean in several states (7,9,11), Morocco (5) and Japan (13), and in soybean in several states (10).

The presence of PSV in western Arkansas extends the western fringe of reported occurrence, except for the western strain in Washington (11). The limited sampling reported here is not sufficient to determine prevalence of the virus throughout Arkansas. Because white clover is an important overwintering host for PSV in other areas (3,4,8,12) and seed transmission is not important in bean (4), infected white clover is probably the most important factor in recurrence of the disease in the Fayetteville bean nursery. Three aphid species that vector PSV (7) have been found in this area (University of Arkansas Entomological Reference Collection).

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