A New Disease of Pinto Bean caused by Aphelenchoides ritzemabosi and its Associated Foliar Symptoms

Gary D. Franc and Colette M-S. Beaupre
University of Wyoming
Department of Plant, Soil and Insect Sciences
P.O. Box 3354
Laramie, WY 82071-3354.

Introduction

A new disease of pinto bean caused by Aphelenchoides ritzemabosi was recently described in Wyoming (2). Field observations made during August 1992 in north central Wyoming, following a cool wet period, revealed pinto bean plants (Phaseolus vulgaris L., cultivar Othello) with numerous dark, angular lesions on leaves and, occasionally, a superficial necrosis on the upper surface of the petiole (1). Microscopic examination revealed that a nematode was associated with symptomatic tissue. Koch's postulates were completed with P. vulgaris, cultivar Othello, and nematodes recovered from symptomatic tissue collected at two field sites.

Results and Discussion

Inoculated unifoliate and trifoliate leaves of pinto bean plants (cultivar Othello), grown in a growth chamber, developed angular lesions after ca. 11 days at 22 C that were similar in appearance to those observed in the field. The discoloration associated with angular lesions became more obvious 14 to 20 days after inoculation. The expansion of individual angular lesions was limited by leaf veins with most lesions ranging in size from several millimeters to ca. one centimeter. Occasionally, entire inoculated leaves became chlorotic or necrotic within 24 days after inoculation.

The nematode recovered from the original plant material and after two serial transfers through artificially inoculated plants was identified by A.M. Golden (USDA, ARS Nematology Laboratory, Beltsville, MD) as Aphelenchoides ritzemabosi (Schwartz, 1911) Steiner & Buhrer, 1932.

Significance

Diagnosis of this new disease is possible by relying on foliar symptom expression and the presence of the nematode in symptomatic tissue. It is likely that cool, wet environmental conditions increase the risk of infection and subsequent disease development.

Infection of pinto bean by A. ritzemabosi is likely to cause some degree of yield loss to growers since photosynthetic area of the leaf is damaged or destroyed by the nematode as it feeds and reproduces. This nematode has routinely been found in association with the alfalfa stem nematode, Ditylenchus dipsaci (Kuhn) Filipjev in alfalfa in Wyoming and other western states. Since alfalfa and

pinto bean production areas overlap in Wyoming, it is likely that alfalfa and pinto bean crop rotation may provide a mechanism through which the nematode is able to persist. Fields in which affected pinto beans were found had a recent history of alfalfa production.

Key Citations

1. Franc, G.D. and Colette M-S. Beaupre. 1994. Foliar Symptoms Associated with Infection of Pinto Bean by Aphelenchoides ritzemabosi in Wyoming. Phytopathology 83:1388.

2. Franc, G.D., C. M-S. Beaupre and J.L. Williams. 1993. A New Disease of Pinto Bean Caused by Aphelenchoides ritzemabosi in Wyoming. Plant Disease 77:1168.

WORKSHOP ON BEAN COMMON MOSAIC VIRUS

M. J. Silbernagel, Res. Plant Pathologist
USDA-Agricultural Research Service
G. I. Mink, WSU Virologist,
WSU-IAREC, Route 2 Box 2953A
Prosser, WA 99350-9687

About 50 researchers attended a two-day workshop on the Taxonomy of the BCMV Subgroup of Potyviruses, which was held July 26-27, 1993, in conjunction with the International Working Group on Legume Viruses in Montreal, Canada. The BCMV subgroup of potyviruses are seedborne in large-seeded legumes and include adzuki mosaic virus (AZMV), bean common mosaic virus (BCMV), blackeye cowpea mosaic virus (BlCMV), cowpea aphid-borne mosaic virus (CABMV), peanut stripe virus (PStV), soybean mosaic virus (SMV), and South African passionfruit woodiness virus (PWV).

Researchers presented evidence for interrelationships among these viruses using a wide range of biological, serological, and molecular techniques. Attempts were made to define criteria that can be used to define the viruses as well as distinguish strains, isolates, etc., within viruses. A preliminary proposal summarizing the group's suggestions will be presented to the plant virus subcommittee of the International Committee on Taxonomy of Viruses for their consideration.

A general consensus was reached on the need to consider the temperature-insensitive, necrosis-inducing strains of BCMV, such as NL-3, 5, 8, and TN-1, as a different virus species. Several names were discussed, but the final suggestion was to call that group bean common mosaic necrosis virus (BCMNV). BCMV and BCMNV differ radically in the temperature at which they can induce a hypersensitive lethal systemic necrosis of the vascular system, serologically, in particle morphology, in the kinds of inclusion bodies produced, in the coat protein peptide profiles, and at the molecular level. The BCMNV group seems to be endemic in southern and eastern Africa, and may have evolved on another host besides beans (*Phaseolus vulgaris* L.) that were introduced only about 400 years ago.