



Alfalfa Mosaic Virus (AMV) Infections in Garbanzo Beans

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Introduction

AMV was first identified on lucerne in the USA and now poses a significant threat to worldwide production of garbanzo beans. AMV has infected garbanzo beans in Arizona and California. In April of 2018, a number of garbanzo fields in central Arizona were heavily infected by AMV and resulted in near complete crop failure. Depending on virus-cultivar combination and the stage of growth at infection, severe symptoms can be caused by infection with AMV and yield loss can vary from complete crop failure to decreases in grain yield and quality.

Pathogen

Alfalfa mosaic virus (family *Bromoviridae*, genus *Alfamovirus*).

Host Range

AMV infects over 600 plant species in 70 families, including a number of horticultural and vegetable crops (pulses such as beans and peas, potato, and tomato), pasture legumes and perennial weeds.

Spread

Long distance by contaminated seeds; short distance or locally by common aphid species (more than 20 species of aphid capable of transmitting AMV).

Symptoms And Diagnosis

Symptoms include yellowing, stunting, wilting, shoot tip necrosis and dieback. A laboratory test is required for definitive diagnosis. Entire symptomatic plants should be uprooted and wrapped in a dry paper towel, placed in a plastic bag, and shipped OVERNIGHT to the University of

Arizona's extension plant pathology laboratory in Tucson. All submissions should be accompanied by completed [Plant Disease Diagnostic Form](#).

Conditions Can Be Confused With

Fusarium wilt. To differentiate AMV from Fusarium wilt, cut lower portion of a stem including taproot longitudinally and observe any discoloration in the vascular tissue: Fusarium wilt will tend to have black staining in the center, while AMV discoloration is often brown in the outer bark.

Management

There is no in-season management option recommended for this virus. Studies have shown that chemical spray for aphid control was not cost effective. The most effective measure is resistant variety. Cultural practices to minimize risk of AMV spread include: 1) plant AMV-free seeds. Ask your seed supplier whether seeds have been tested for AMV. If you retain seed, it should be selected from plants without virus symptoms or evidence of aphids; 2) manage weeds to reduce aphid population; 3) keep garbanzo fields away from alfalfa fields; and 4) plant early to reduce the chance of aphid moving through the crop. Late infections appear to be not as damaging as early infections.

References

Jones, R.A. and Coutts, B.A. 1996. Alfalfa mosaic and cucumber mosaic virus infection in chickpea and lentil: incidence and seed transmission. *Ann. Appl. Biol.* 129:491-506



AMV-infected garbanzo bean field



Yellowing (chlorosis) AMV-infected garbanzo bean



Tip necrosis and wilting



Garbanzo bean field heavily infested with AMV



Wilting and death of AMV-infected garbanzo bean



Garbanzo bean field heavily infested with AMV



Necrosis on root bark



Yellowing and stunting



Healthy garbanzo bean root (white vascular tissue)



Root of AMV-infected garbanzo bean (brown discoloration in the vascular tissue)



Root of garbanzo bean infected with Fusarium wilt (black staining in pith)



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