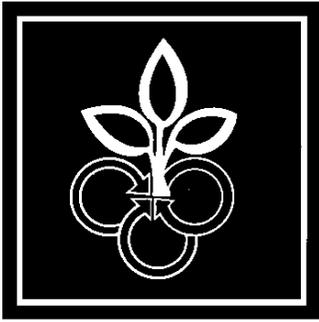


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PURDUE UNIVERSITY • WEST LAFAYETTE IN

Vegetable Diseases

Purdue University
Cooperative Extension Service

Mature Watermelon Vine Decline and Similar Vine Decline Diseases of Cucurbits

*Daniel S. Egel, Extension Plant Pathologist and Richard Latin,
Professor of Plant Pathology
Department of Botany and Plant Pathology
Purdue University
West Lafayette, IN 47591*

Since the mid-1980s, outbreaks of a disease known as mature watermelon vine decline (originally known as sudden wilt) have occurred in watermelon fields in southwestern Indiana. The disease was a limiting factor in many watermelon fields in 1989, 1995, and 1999. In 2000, it was especially severe, affecting more than 50% of watermelon acreage in Sullivan, Knox, and Gibson counties, and resulted in total estimated yield losses of 20%.

This bulletin describes characteristics of mature watermelon vine decline (MWVD) and addresses features that distinguish this disease from more common watermelon diseases that have similar symptoms. Current research at Purdue University's Southwest Purdue Agricultural Program in Vincennes is designed to investigate and identify factors that contribute to MWVD outbreaks. Until the cause has been determined, standard watermelon production practices are recommended, especially the selection of well-drained fields without a history of the disease and rotation with non-cucurbit crops.

MWVD

Initial symptoms of MWVD include the wilt and collapse of affected vines (Figure 1). Root systems of symptomatic plants are generally sparse, with necrotic primary roots and few secondary roots (Figure 2). Symptoms first appear on mature plants, in low, poorly drained areas of a field (Figure 3). Under certain conditions, disease incidence will increase through the summer, often resulting in the collapse and decline of large portions of affected fields (Figure 4). The vine collapse limits fruit production and enlargement, prevents normal ripening, and exposes fruit to sunburn. MWVD-affected plants often yield no marketable fruit.

(MWVD continued on back page)



Figure 1



Figure 2



Figure 3



Figure 4

(MWVD continued)

Since outbreaks were first noted in the mid-1980s, we have made several consistent observations associated with this disease.

- All watermelon cultivars appear to be equally susceptible.
- Muskmelon and other cucurbits are not affected by MWVD.
- Outbreaks have been observed in fields only where plastic mulch was used.
- Soil fungicides and biological control agents were not effective in preventing symptom expression in limited field experiments in 2000.
- MWVD has been observed in fumigated watermelon fields.
- It appears that no soilborne organism is singly responsible for the damage.

Fusarium Wilt

Fusarium wilt is caused by a soilborne fungal pathogen (*Fusarium oxysporum* f. sp. *niveum*). This disease is easily identified in our laboratory. Although plants affected by Fusarium wilt eventually collapse and die (Figure 5), there are some distinct differences between this disease and MWVD. Fusarium wilt results in necrosis of vascular tissues and stem lesions near the crown of the plant (Figures 6 and 7). Also, watermelon varieties differ in their susceptibility to Fusarium wilt. Finally, the wilt disease outbreaks often occur among clusters of plants and rarely destroy an entire field.

Root Knot Nematode

Both MWVD and root knot nematode can cause the collapse and decline of watermelon plants over a broad area. However, root knot nematode affects a range of plants including muskmelon and tomato. MWVD has only been observed on watermelon. While roots of plants affected by MWVD may be discolored and rotten, roots of plants affected by root knot nematode have clearly distinguishable galls (Figure 8). Root knot-affected plants also are normally clustered in a field, and usually exhibit stunted growth. In most cases, the decline of plants caused by MWVD is much more rapid than that caused by root knot nematode.

Bacterial Wilt

Bacterial wilt is caused by *Erwinia tracheophila*, a pathogenic bacterium that is spread by striped and spotted cucumber beetles. Bacterial wilt also causes a rapid wilt and collapse of infected plants (Figure 9). However, the essential difference between bacterial wilt and MWVD is the fact that bacterial wilt occurs on muskmelon and cucumber, but does not affect watermelon.

Descriptions of watermelon and muskmelon diseases in the Midwest are well described in the Purdue CES publication *Diseases and Pests of Muskmelon and Watermelon* (BP-44). It is available through the Media Distribution Center by calling 1-888-EXT-INFO.



Figure 5



Figure 6



Figure 7



Figure 8



Figure 9

