Plant Disease and Insect Advisory

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Phytophthora blight identified on watermelon

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Phytophthora blight, caused by *Phytophthora capsici*, is a devastating disease of cucurbits and peppers in the United States. Phytophthora blight was recently identified in a field of watermelons in southwestern Oklahoma where it caused a severe fruit rot (Fig. 1). The disease became readily apparent following the heavy rains from tropical storm Erin, although it first appeared before the storm in a low area of the field. Phytophthora blight is a stubborn disease that has become severe over much of the eastern United States during the last 10 years. On squash and peppers, it causes a crown rot that appears as an elongated, soft lesion that extends above the soil line causing the plants to wilt and die. On watermelons and cucumbers it mainly causes fruit rot. Fruit lesions become soft and covered with a white powdery growth (Fig. 2) that consists largely of asexual reproductive structures called sporangia (Fig. 3). Sporangia can act like individual spores, germinating directly, or in the presence of water, release numerous smaller, swimming spores called zoospores. Infested fields generally consist of 2 mating types (A1 and A2) that cross to form oospores. Oospores remain dormant in soil until another susceptible crop is planted when they germinate to produce sporangia. Oospores survive indefinitely in the soil and reports exist of disease developing following crop rotations of 5 to 10 years.

Fig. 1. Fruit rot of watermelon caused by *Phytopthora capsici*.

Phytophthora blight is a highly moisture dependent disease, and its development and spread is based almost entirely on surface water accumulation and movement. It generally develops first in low areas of a field where water collects, and spreads with surface water movement. In dry years the disease may not appear. However, in years when heavy rainfall occurs resulting in generally saturated conditions, entire fields can be totally lost to the disease.

Fig. 2. White powdery growth on watermelons affected by Phytophthora blight.

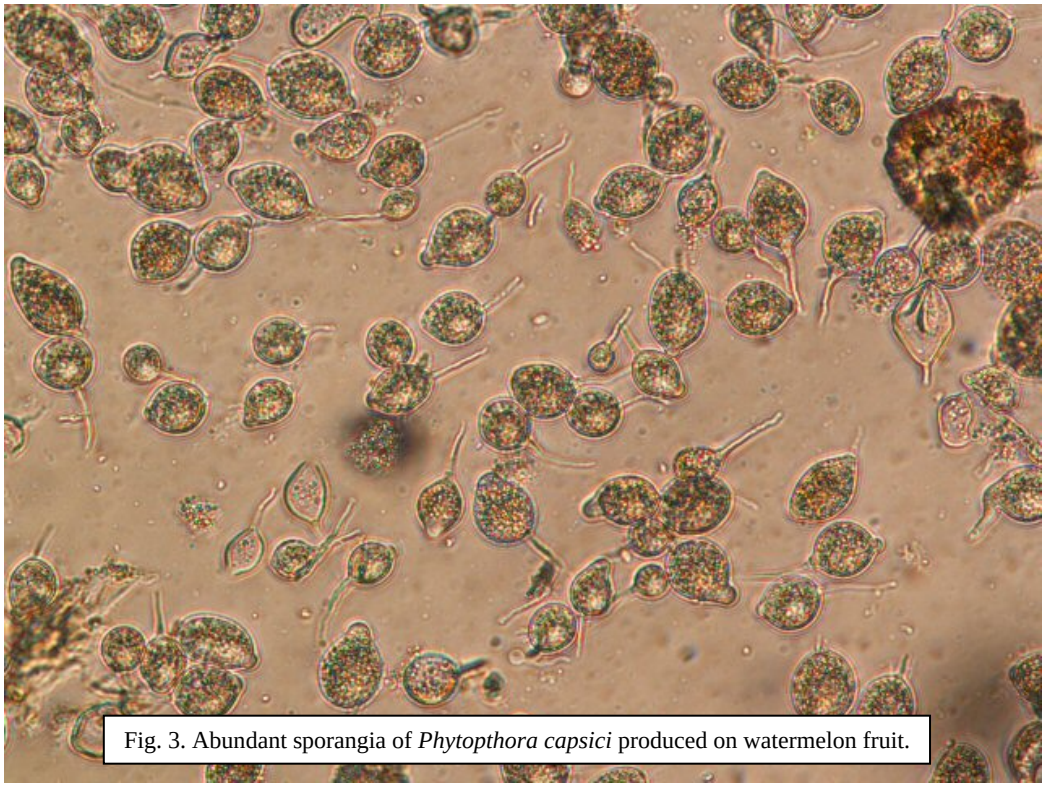

Fig. 3. Abundant sporangia of *Phytopthora capsici* produced on watermelon fruit.

The disease has proven difficult to nearly impossible to manage at a high level. Despite the most dedicated application of a management program consisting of recommended cultural and chemical strategies, unacceptable levels of disease may occur following periods of heavy rains. Therefore the most effective control strategy is to not plant susceptible crops in a field infested with *P. capsici.* Planting a susceptible crop in an infected field caries an inherent risk of crop failure. The following management strategies are recommended to reduce this risk:

Site selection: Avoid planting susceptible crops (cucurbits, peppers, tomatoes, and beans) in problem fields or in fields that receive drainage from a problem fields.

Cultural practices: Plant only in well drained sites and avoid planting in low areas such as terrace bottoms. Plant on raised beds and/or in fields constructed to rapidly and completely drain. Alternatively, use of no-till production systems following small grains helps promote water infiltration into the soil while the stubble minimizes splashing. Time irrigations to minimize puddling.

Sanitation: Avoid dumping culls from problem fields onto production fields. When irrigating with surface water, insure that the water source does not receive runoff from an infested field. Power-wash tractor tires and tillage implements after working problem fields and before entering clean fields.

Chemical control: Results have been mixed following the use of fungicide programs to control Phytophthora blight. Mefenoxam/metalaxyl (Ridomil Gold) has been applied preplant incorporated and as a foliar spray in combination with copper hydroxide (Ridomil Gold/Copper). Strains resistant to this fungicide have developed rendering it ineffective in many areas. Intensive foliar spray programs have mostly relied on Gavel (zoxium+mancozeb), Acrobat (dimethamorph), and Tanos (cymoxanil + famoxadone) applied alone or in combination with copper hydroxide (Kocide). Positive effects have been reported, but the degree of disease control is often low (50% or less) and inconsistent among trials conducted in various states.

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