Purple Spot Disease of Asparagus

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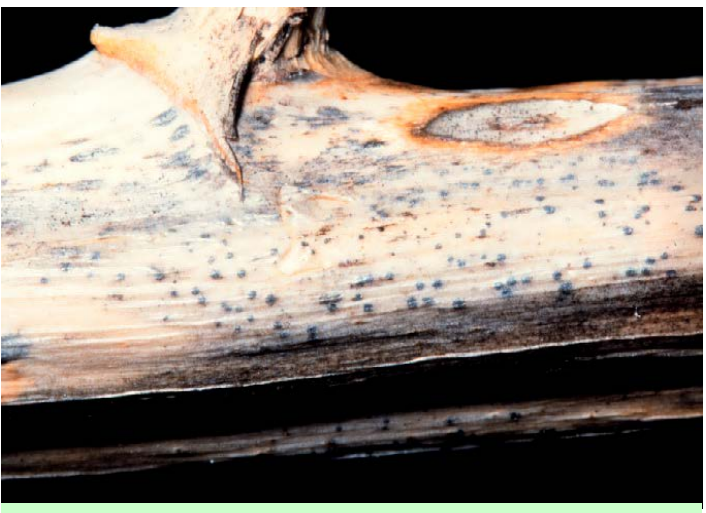
The Pathogen:

The fungus *Stemphylium vesicarium* causes purple spot disease of asparagus spears and fern in many growing regions of the world, including Michigan. The sexual stage of the organism (referred to as *Pleospora herbarium* in this state) produces overwintering structures (pseudothecia) that contain and release sexual spores (ascospores) in the spring. These structures appear to the eye as small, black dots on asparagus plant debris from the previous season. They are responsible for releasing ascospores via rain splash and wind and cause the primary infection for the new growing season. Following initial infection, the fungus progresses in its asexual state (*S. vesicarium*) and produces multiple spore (conidia) cycles throughout the growing season. These conidia cause secondary infections by entering plant tissue through wounds and stomata (the pores of a plant used for gas exchange) under favorable environmental conditions.



Pseudothecia overwintering on asparagus debris.

The Disease:

Purple spot disease was named for the sunken, purple, oval-shaped lesions that develop on asparagus spears. During seasons that experience heavy disease pressure (60-90% infection), spears may be rejected for fresh-market sales. More damaging, however, is the infection on the plant fern and cladophylls (needle-like branches), which appear as tan to brown lesions

Purple spot on asparagus stems.

that may expand, merge together and cause defoliation. Premature defoliation of the asparagus fern limits the photosynthetic capability, thereby decreasing carbohydrate reserves in the crown for the following year's crop. This can reduce spear quality and marketable yield. Infection of asparagus fern in

Conidia of *Stemphylium vesicarium*.

Purple spot lesion with visible spore production.

Asparagus field with severe purple spot disease.

Michigan can be attributed to the adoption of a no-till cultural system, which allows the previous year's plant debris to remain in the field and become the primary source of ascospore dispersal the following spring.

Management:

Management tactics differ in Michigan compared to warmer asparagus-producing regions. Burying plant debris at season's end is not practiced in order to minimize damage to crowns that may lead to Phytophthora and Fusarium root rot infection. Current practices focus on using cover crops to reduce spear wounding from windblown sand and applying fungicides in conjunction with the TOM-CAST disease forecasting system. Currently, fungicides containing chlorothalonil or azoxystrobin, a reduced risk product, are approved for use on asparagus and provide disease control when used as protectants. Based on research results, TOM-CAST has become a standard in most commercial asparagus production systems in Michigan. This disease forecaster alerts growers to spray only when the environmental conditions are favorable for purple spot (extended dew or rainy periods accompanied by warm temperatures) which can reduce the number of spray applications per season. Effective fungicides applied according to TOM-CAST can allow growers to manage the disease, while saving money and preserving the environment.

Asparagus spears with purple spot.

Asparagus ferns with severe purple spot.

Management Strategies

- Minimize plant debris.
- Avoid wounding buried crowns.
- Plant cover crops to prevent sandblasting.
- Use the TOM-CAST disease forecasting system to time spray applications.
- Apply fungicides with chlorothalonil or azoxystrobin as the active ingredient.