

Purple spot and Stemphylium leaf spot of asparagus

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For several years, California asparagus growers have noticed purple spots that develop near the base of the spears before harvest. The condition is worse following cool, wet weather and was more severe during 1982 and 1983 than in previous years, resulting in higher rejection rates during cutting and packing.

In 1982, the fungus, *Stemphylium vesicarium* Wallr., that causes this disease, purple spot, was first isolated from spears in a field in the San Joaquin Delta. It produces elliptical, slightly sunken lesions $\frac{1}{2}$ to $\frac{3}{8}$ inch across and up to $\frac{1}{4}$ inch long with a purple margin and a brown center especially in larger lesions. The internal tissue of the spear is not affected. During the 1983 harvest, the same fungus was isolated from spears in several other fields in the Delta, Salinas Valley, and coastal southern California but not from asparagus fields in the desert areas of southern California.

In all of the fields in which purple spot occurred, debris from the previous summer's fern growth was lying on the soil surface. Close examination revealed many small ($\frac{1}{4}$ inch in diameter) black spots (pseudothecia) on the surface of the debris. This is the sexual stage, *Pleospora allii* (Rabenh.) (es & de Not.), of *Stemphylium vesicarium*. It is thought to be the main means by which the fungus overwinters and is also the main source of wind-borne ascospores causing spear infection during the spring.

Work at Davis in 1983 showed that purple spot was worse during the early part of the harvest season following wet weather and when air temperatures varied between 34° and 68°F (1.1° and 20°C). As rainfall ceased and air temperatures increased, the incidence of the disease decreased to nil.

Stemphylium vesicarium was also isolated from green fern on plants in a nursery block left to grow for a second

year in the Salinas Valley. Large elliptical lesions ($\frac{1}{4}$ to $\frac{3}{8}$ by $\frac{3}{8}$ to $\frac{1}{2}$ inch) with a dark margin and light brown to gray center were present on stems and branches of the fern. This disease, known as *Stemphylium* leaf spot, is also recognized as a disease of asparagus in Michigan, Japan, and New Zealand. In New Zealand, tests of fungicides for the control of *Stemphylium* leaf spot have shown that captafol at $\frac{1}{2}$ quart active ingredient (1 quart Difolatan 50 percent active ingredient) in 120 gallons of water per acre sprayed over the fern at two-week intervals from the first sign of the disease provided good control. Work is presently under way to obtain a registration for the use of captafol on asparagus in California.

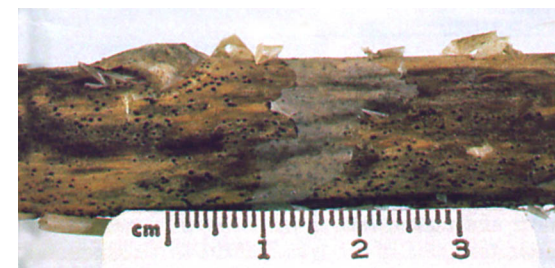
Using fungicides on spears to protect against purple spot seems impractical. No systemic fungicides have been found effective against *Stemphylium*, and it would not be feasible to keep a protective cover on all tissue surfaces, because new spears are emerging every day. Furthermore, fungicide application so close to harvest would leave a residue. Results from elsewhere have shown that removal of dead fern during the winter significantly reduced the incidence of purple spot. Complete burial of fern debris during winter cultivation or burning dead fern would be the best methods of eradicating the overwintering form and therefore reducing the incidence of purple spot in the spring.

Work will continue at Davis to study the conditions under which purple spot occurs in the field. We are also cooperating with researchers in New Zealand in the development of resistant asparagus varieties.

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Purple spot lesions occur mainly on lower half of asparagus spear. Internal tissue is not affected. *Stemphylium* leaf spot causes large elliptical lesions on summer fern (left). Lesions have a dark margin and light brown to gray center.



Small black spots (pseudothecia) on previous summer's fern growth are source of wind-borne ascospores for spear infection during spring.