Black Polyethylene Mulch and Phytophthora Blight of Pepper

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The emphasis on fresh market production in New Jersey and other areas has resulted in the adoption of numerous new cultural practices. In many instances, the effect of these practices on disease incidence has not been thoroughly evaluated.

Black polyethylene mulch is one of the new cultural practices being used by New Jersey pepper growers. Yields have exceeded 1,000 bu/A when the mulch is used together with healthy transplants, proper nutrition, trickle irrigation, and the high-yielding variety Harris' Lady Bell. However, this cultural system has significantly increased losses from Phytophthora blight (*P. capsici*).

During the past several years, Phytophthora blight has caused substantial losses in southern New Jersey's pepper crop. The disease occurs in two phases, with the crown and root rot phase appearing early in the growing season. Infected plants appear first in low, poorly drained areas of the field. Later, the disease may be observed spreading from the original site to higher areas in the field, particularly when plants are growing through polyethylene mulch. Additional plants succumb to the disease during each period of saturated soil conditions.

As temperatures increase and the plant canopy fills the row, the aerial blight phase of the disease may occur with any heavy, wind-driven rain. The stems and fruit are most frequently attacked, but the leaves may also become infected. Stem lesions are particularly destructive, since all portions of the plant above the lesion die rapidly.

The collar rot phase of the disease can be controlled with repeated applications of the experimental fungicide Ridomil 2E. Equally effective and easier to accomplish are ensuring proper drainage in the field and growing plants on raised beds or ridges; these must be high enough to make certain roots and crowns of the plants are above any standing water. The aerial blight phase is effectively controlled with Difolatan 4F. Applications of 3 pt/A are begun when conditions become favorable for this phase of the disease and are repeated every 10 days, for a maximum of five applications. New Jersey has received an emergency exemption for this use pattern.

Application of Soil Fumigant by Overhead Irrigation System

Working in cooperation with P. B. Adams of the USDA Soil-Borne Disease Laboratory in Beltsville, MD, we evaluated the effectiveness of using a commercial overhead irrigation system to apply Vapam (32.7% solution) to the soil. Vapam was metered into the system with an injector pump and dispensed during the entire irrigation period. Generally, 1–1.5 acre inches of Vapam solution was applied to wet the soil to a depth of at least 8 in., resulting in a uniform concentration of Vapam in the soil profile. The field was not disturbed for 14–21 days; the soil was then worked into suitable planting conditions and the crop planted.

The procedure has been evaluated for control of lettuce drop (*Sclerotinia minor*) and onion white rot (*Sclerotium cepivorum*). Control was better with 25 gal/A of Vapam dispensed by the overhead irrigation system than with 75–100 gal/A applied with conventional soil injection procedures. Similar successful results with the overhead application method have been reported from the Pacific Northwest for Verticillium wilt of potato.

Fungicides for Lettuce Drop

Routine fungicide testings for control of lettuce drop have been done in New Jersey for many years. During the past 2 years we have investigated the effectiveness of various biological control agents, with and without supplemental fungicide treatments.

Of the many control strategies examined, chemical measures are the only consistently effective ones. Sclex, a discontinued experimental fungicide, provided season-long control with one application early in the season. All other fungicides performed best with three applications, the first a few days after thinning or transplanting, then two additional applications 10 and 20 days later.

Benlate 50WP (2 lb/A), Topsin M 70WP (3 lb/A), Rovral 50WP (2 lb/A), and Ronilan 50WP (1.5 lb/A) have performed very well in New Jersey. We are fortunate to have received an emergency exemption for the use of Ronilan on lettuce for the fall crop in New Jersey. We are hopeful that Ronilan and some of the other effective fungicides will receive full registration to assist growers in all areas of the country.