CAES
The Connecticut Agricultural Experiment Station
Putting Science to Work for Society since 1875

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BLACK ROT OF GRAPES

Black rot is one of the most important diseases of grapes in commercial vineyards and home gardens. The disease attacks all above ground parts of grapevines including leaves, shoots, petioles, and fruit. Severe epidemics of the disease can cause significant yield losses due to fruit rot. If not effectively managed, the disease can be very destructive and cause complete crop loss in warm and humid weather conditions. Black rot is a major challenge to organic production of susceptible grape varieties.

SYMPTOMS AND DIAGNOSTICS

All new growth of the grapevine is susceptible to black rot during the growing season. The initial symptom of the disease on leaves appears as small brown spots with darker edges and yellow halo (Figure 1). As the disease progresses, many lesions merge to form irregular blotches on the leaf. On matured brown lesions, black fungal fruiting bodies (pycnidia) develop just inside the margin of the spot (Figure 2). On berries, the symptom first appears as small light or purple brown spots, and then the necrosis continuously expand until entire berry turns dark brown and rots (Figure 3). When infected berries dry, they shrivel into hard black mummies that firmly attached to the pedicels and covered with fungal fruiting bodies (Figure 4). When petioles and shoots are infected, symptoms appear as oval to elongated dark brown lesions that may girdle young shoots and result in stem diebacks.

DISEASE DEVELOPMENT

Black rot of grapes is caused by a fungal

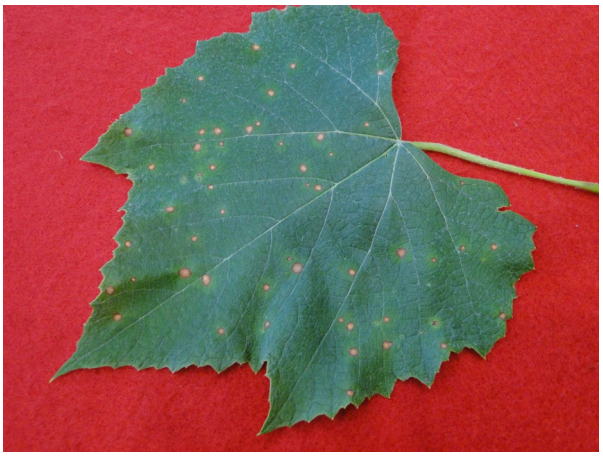

Figure 1. Brown spots with yellow hale on a leaf

Figure 2. Black fungal fruiting bodies on a brown lesion

Figure 3. Purple brown spots and rot on berries

Figure 4. Dried black mummy berries on pedicels

pathogen *Guignardia bidwellii*. The key factors that affect the level of the disease are the amount of overwintering inoculum and the current season's weather conditions. The fungus overwinters primarily on infected mummies within the vine and on the ground although it also can overwinter on diseased canes, tendrils, and leaves. In the spring, spores ooze out fungal fruiting bodies in rainy and wet weather conditions. Fungal spores are dispersed by wind and rain splash. Young leaves are highly susceptible to the disease as they unfold, but they become resistant as they finish expanding. Spore germination and infection require 24-hours of leaf wetness at 50°F. At the optimum temperature of 70-80°F, it only needs 6-7 hours of wetness for spores to germinate and infect green plant tissues. So, warm and rainy weather conditions, especially in late spring and early summer, favor the disease development. Spores that are released from infected leaves can serve as secondary inoculum for further infection of young berries and other tissues throughout of the season.

MANAGEMENT

Cultural practice: Sanitation is the first line of defense and critical for successful management of black rot. Remove diseased leaves, canes, spurs, and mummies that remain on the vines and/or have fallen on the ground, which can reduce the level of overwintering inoculum. In the early spring, apply new mulch to bury mummies on the ground and prevent spores released. Plant grapevines in the area that provides plenty of sun and good air circulation. Prune vines properly to promote air circulation. Avoid overhead irrigation. Remove infected fruit as it is discovered during the growing season.

Fungicide application: Correct timing of fungicide application is critical to effective management of black rot because most fungicide are preventative. Apply protectant fungicides from shortly before bloom through 4 weeks after bloom. Registered fungicides for commercial use only include azoxystrobin, difenoconazole, flutriafol, tetraconazole, kresoxim-methyl, pyraclostrobin, tebuconazole plus trifloxystrobin, and difenoconazole plus cyprodinil. The fungicide option for homeowners includes ferbam, fenarimol, mancozeb, myclobutanil, and ziram. For organic production systems, copper provides moderate control. Always read the label carefully and follow all directions.

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