

Leather Rot in Ohio Strawberries

M. A. ELLIS and G. G. GROVE, Department of Plant Pathology, Ohio State University, Ohio Agricultural Research and Development Center, Wooster 44691

ABSTRACT

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Leather rot of strawberry, caused by the fungus *Phytophthora cactorum*, was observed throughout Ohio during 1981. In six 10- to 20-acre plantings surveyed, 20–30% of the crop was lost to leather rot. In seven plantings surveyed during 1982, losses due to leather rot ranged from 5 to 30%.

Leather rot of strawberry (*Fragaria* × *ananassa* Duch.), caused by the fungus *Phytophthora cactorum* (Leb. & Cohn) Schroet., has been reported from many regions throughout the United States (1,2,4). In Ohio, the disease was not reported previously and was not considered economically important until 1981. Excessive rainfall during May, June, and early July 1981 resulted in heavy disease losses to Ohio's strawberry crop of about 1,500 acres. Several growers reported as high as 50% crop loss primarily to fruit rots.

Although grey mold, caused by *Botrytis cinerea* Pers. ex Fr., was common throughout Ohio in six 10- to 20-acre plantings surveyed in Knox, Lorain, Sandusky, Tuscarawas, Warren, and Wayne counties, 20–30% of the crop was lost to leather rot. It is important to note that most growers did not recognize leather rot. They assumed the fruit was either rotted by *B. cinerea* or was simply overripe.

Leather rot was also observed throughout the state in 1982 but disease incidence was much less. In seven 10- to 20-acre plantings surveyed in Coshocton, Geauga, Knox, Sandusky, Stark, and Wayne counties, losses ranged from 5 to 10%. In Sandusky County, a 10-acre planting received localized heavy rainfall during late bloom and the grower lost 30% of his early-bearing crop (cultivar Earlyglow) to leather rot. All cultivars surveyed appeared susceptible to leather

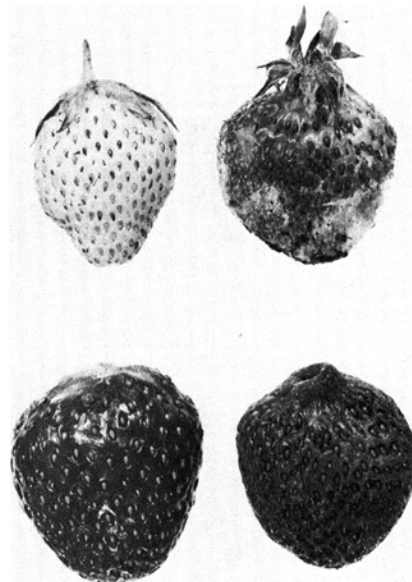


Fig. 1. Leather rot symptoms on a green (immature) and mature strawberry fruit inoculated with *Phytophthora cactorum*. Fruits on the left are uninoculated controls.

rot. These included Earlyglow, Guardian, Klondike, Marlate, Midway, Pochahontas, Red Chief, Robinson, Scott, and Vesper.

The disease was observed most commonly in poorly drained areas of the field and on berries that were in contact with soil. The disease was also prevalent, however, in well-drained areas and on fruit without soil contact.

Symptomatology. *P. cactorum* infected berries at all stages of development. Infection of green fruit was common. On green berries, diseased areas were dark brown or natural green outlined by a brown margin. As the decay spread, the entire berry became brown, maintained a rough texture, and was leathery (Fig. 1). In time, infected berries dried into hard brown mummies.

On fully mature berries, infection often resulted in little color change but discoloration ranging from brown to

dark purple was observed (Fig. 1). When diseased berries were cut in cross section, a marked darkening of the xylem tissues of each fruit was often observed. In later stages of decay, mature fruit also became tough and leathery. Occasionally, a fine white growth of mycelium could be observed on infected fruit.

Berries affected by leather rot had a distinctive unpleasant odor and taste. At one planting in Tuscarawas County, the unpleasant odor of leather rot could be detected up to a quarter of a mile away from the planting. Even the healthy tissue on a slightly rotted berry was bitter. This represented a special problem to growers in "pick-your-own" operations, which account for most of Ohio's production. An infected mature berry with little color change may appear normal and be picked and processed with healthy berries. Consumers have complained of bitter tasting jam and jelly made with berries from fields where leather rot was a problem.

Isolation and pathogenicity tests. Infected fruit were collected from several fields throughout north central Ohio. Tissue sections from diseased berries were placed on pentachloronitrobenzene-benomyl-neomycin-chloroamphenicol (PBNC) medium (3) and incubated in continuous light at 23 C. *P. cactorum* was easily isolated from all diseased berries. Identification of the fungus was verified by Dr. A. F. Schmitthenner, Ohio Agricultural Research and Development Center, Ohio State University, Wooster. Isolates were purified on PBNC media, transferred to slants of V-8 juice agar (3), and stored at 5 C.

Immature (green) and mature berries inoculated with either agar plugs or zoospore suspensions prepared from these isolates developed typical leather rot symptoms within 3 days (Fig. 1). *P. cactorum* was recovered from all inoculated fruit.

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