

Botryosphaeria ribis on Apple
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For the past seven years *Botryosphaeria ribis* (G. & D.) has been recognized as an important pathogen on certain apple varieties. The organism has a wide host range on woody plants and is omnipresent. It is, however, weakly parasitic on most hosts and requires certain host predisposing factors for disease development. It is of potential economic importance throughout the apple growing regions as successful isolations have been made from apple wood lesions found in every area examined.

Varieties in Indiana have been found to vary with respect to susceptibility. Golden Delicious and Grimes Golden are very susceptible to the fruit rot stage; while Rome Beauty and its red sport, Gallia Beauty, are especially susceptible to the wood canker stage.

Wood infections vary from extensive deep cankers resulting in limb dieback on Rome Beauty, small circular lesions on Golden Delicious, hard raised pimples on Cortland, to extensive shallow non-girdling lesions on Ben Davis.

On Rome Beauty and Gallia Beauty, visible symptoms developing from new infections were observed from early June until September. New infections are expressed by the formation of a liquid filled blister. This enlarges and ruptures, releasing the viscous liquid over the limb surface. Growth of the organism usually extends rapidly through the wet area, forming a dark sunken lesion. Lesion extension ceases in early autumn and marginal splitting may occur. Stromatic bodies are formed under the periderm during autumn and winter. Mature conidia are produced as early as mid-April and are dispersed at periodic intervals throughout the summer. The ascospore stage, produced in July, is rarely found and is not considered important in the perpetuation of the organism. Wounds are necessary for successful infection.

Fruit infection has been found to occur at any time from first cover to harvest. Wounds or cuticle breaks are necessary for infection. Infections occurring prior to mid-July do not develop into visible lesions until fruits are mature. Apparently the organism remains in a latent state in the infection site until compounds favoring fungal growth are present in the fruit. Infections occurring after mid-July produce macroscopic symptoms within a short time. Most *B. ribis* rot symptoms present prior to harvest are apparently the result of infection during this period.

Fruit rot lesions on immature fruits develop slowly and a narrow red ring surrounding the lesion may be evident on yellow varieties. Rot lesions on mature fruits spread quickly, forming a series of light-colored ovoid spots regularly spaced around the middle or lower surface of the fruit. These coalesce to form a completely rotten light-colored fruit. Syrupy beads of exudate form on the surface of the fruit.

No single obvious factor apparently predisposes the host to infection. Controlled inoculation tests have indicated that any factor or

combination of factors which reduce tree vigor will favor disease development. These include moisture and nutritional deficiencies, winter damage, sunburning, and, with the fruit rot stage, the balance of concentrations of certain sugars and tannins. The possibility that *B. ribis* is a part of a disease complex involving other microorganisms (nematodes, root rot fungi, etc.) cannot be overlooked.

During the past five years representatives of all classes of fungicides have been tested for control of the wood canker and fruit rotting stages of *B. ribis*. These have been used as poultices, slurries, and sprays. Two materials, Chlorosulfane, (N-chloromethano-sulfon-N-trichloromethano-mercaptoanilide) and Panogen (2.2% methylmercury dicyandiamide) during spring and summer applications have shown promise as a control for the wood canker stage. Captan, Captan plus lead arsenate, Phaltan and Phaltan plus lead arsenate through the summer have been the most effective in controlling the fruit rotting stage.