THE OHIO STATE UNIVERSITY EXTENSION

Extension FactSheet

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Bacterial Ring Rot of Potatoes

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Bacterial ring rot is an important disease of potatoes and is one of the main reasons for rejection of seed potatoes from certification programs. This disease is particularly serious because it has the potential to spread quickly throughout a farm and may lead to severe losses if left unchecked. Ring rot was originally found in Germany in the late 1800's. The causal bacteria were introduced into the United States in the early 1930's and by 1940 were found throughout the country.

Symptoms

Severe ring rot can result in wilting of leaves and stems along with yellowing and death of leaves. Lower leaves usually wilt first, are slightly rolled at the margins, and are paler green than healthy leaves. As wilting progresses, leaf tissues between veins become yellow. In the later stages of disease, margins of lower leaves die and become brittle, and eventually entire stems yellow and die. Frequently, only one or two stems in a hill will develop symptoms and, in some cases, there are no above-ground symptoms at all. Ring rot derives its name from a characteristic breakdown of the vascular ring within the tuber. This often appears as a creamy-yellow to light-brown, cheesy rot. The symptom is most frequently observed when a diseased tuber is cut crosswise at the stem end. In severe cases, the vascular ring may be separated, and a creamy or cheesy exudate can be forced out from this tissue when the tuber is squeezed. On the outer surface, severely diseased tubers may show slightly sunken, dry, cracked areas. Infected tubers are often invaded by secondary decay organisms which may lead to complete breakdown. Symptoms of ring rot in the vascular tissue of infected tubers are often less obvious than described above, appearing as only a broken, sporadically appearing dark line, or as a continuous, yellowish discoloration. Because of this, laboratory tests should always be performed to confirm a diagnosis of ring rot.

Causal Organism

Ring rot is caused by the bacterium *Clavibacter michiganense* subsp. *sepedonicus*. Ring-rot bacteria survive between seasons mainly in infected seed tubers. They are also capable of surviving 2–5 years in dried slime on surfaces of crates, bins, burlap sacks, or harvesting and grading machinery, even if exposed to temperatures well below freezing. Survival is longest under cool, dry conditions. Ring-rot bacteria do not survive in soil in the absence of potato debris, but can survive from season to season in volunteer potato plants. Wounds are necessary for penetration of the bacteria into seed pieces. The pathogen is easily transmitted from diseased tubers to healthy seed pieces during the seed-cutting process. A knife that cuts one infected tuber can spread these bacteria to the next 20–100 seed pieces. Likewise, the bacteria may be spread during planting, particularly if a picker-type planter is used. Ring-rot bacteria can be moved in irrigation water and by chewing insects, such as Colorado potato beetles and flea beetles. After the bacteria become established in a plant, they multiply and move throughout the plant via the water-conducting tissues. Fortunately ring-rot bacteria are capable of causing disease only in potato, although they may be able to colonize roots of sugar beets.

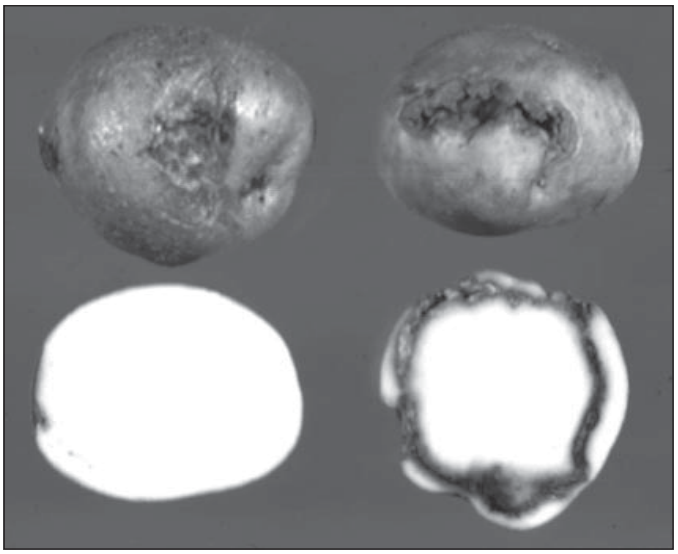

Figure 1. Brown, cheesy decay of the vascular ring of a potato tuber characteristic of ring rot. Severely diseased tubers may show slightly sunken, dry, cracked areas on outer surfaces.

Management

1. Plant only certified disease-free seed tubers. In the U.S. and Canada, certified seed potatoes are produced under regulations mandating zero tolerance for ring rot. Although use of certified seed tubers will not guarantee total freedom from ring rot bacteria, it is the best assurance.
2. Discontinue use of any lot of seed tubers in which ring rot is found. Seed lots known to be contaminated with ring-rot bacteria should never be planted.
3. Before handling seed tubers, all containers, tools, knives and mechanical cutters, planters, and other equipment should be thoroughly washed with a detergent solution, rinsed, and then sanitized with a disinfectant (for current recommendations, see the Ohio Vegetable Production Guide, OSU Extension Bulletin 672). When cutting seed tubers, the cutting tool should be periodically washed and sanitized. It is essential that this be done before cutting seed tubers from a different source. To be effective, disinfectants must be present for a minimum of 10 minutes (preferably 20–30 minutes) on any surface being treated. It is much easier to disinfect metal surfaces than wood or burlap.
4. If ring rot is confirmed to be present, a thorough cleanup must be undertaken. Dispose of all infected tubers away from potato production areas. Clean all surfaces of storages and equipment to remove all mud, dirt and debris and then wash with a strong detergent in hot water applied by a high-pressure washer. **After cleaning,** sanitize all storages and equipment with a disinfectant. Do not plant potatoes for two seasons in any field in which ring rot has been found.

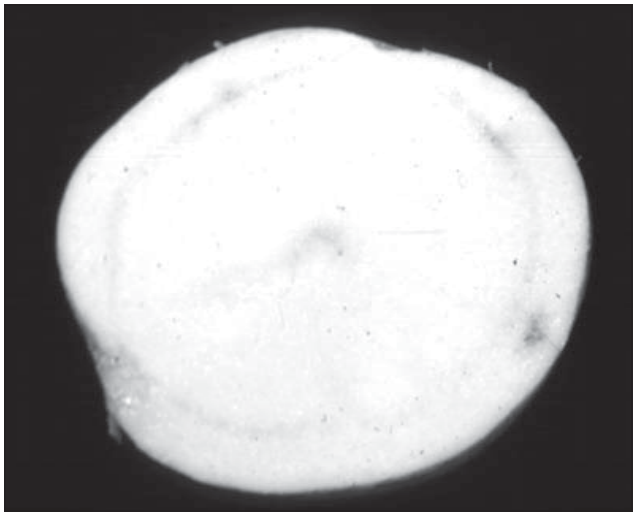

Figure 2. Ring rot symptoms of the vascular ring often appear only as a broken, sporadically appearing dark line or a continuous, yellowish discoloration.

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