UNIVERSITY OF KENTUCKY College of Agriculture, Food and Environment

COOPERATIVE EXTENSION SERVICE
UNIVERSITY OF KENTUCKY COLLEGE OF AGRICULTURE, FOOD AND ENVIRONMENT

Plant Pathology Fact Sheet PPFS-VG-18

Blackleg & Bacterial Soft Rot of Potato

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Introduction

Blackleg and soft rot are bacterial diseases that cause heavy losses in Kentucky potato patches in some years. These diseases may result in missing hills when seed pieces are destroyed or the sprouts decay before they emerge from the ground. Serious rotting of tubers in potato hills and in storage can also occur.

Symptoms

Sprouts of infected tubers may fail to emerge from the soil following planting; sprouts that do emerge may show curled upper leaves, compact foliage, stunting, and fading from green to yellow-green. Infected plants later assume a distinct yellow color and gradually die as the lower stem rots away. When pulled, affected plants will have slimy, rotted, dark or inky black, mushy stems. These blackened stems (Figure 1) give blackleg its name. Soft rot occurs as a slimy rot of tubers (Figures 2 & 3) without the dark coloration.

Cause & Disease Development

Blackleg is caused by *Erwinia atroseptica* (synonym: *Pectobacterium carotovorum* subsp. *atrosepticum*) and soft rot is caused by *E. carotovora (*synonym: *Pectobacterium carotovorum* subsp*. carotovorum)*. These bacteria can live in soil, in decaying plant debris, and in seed tubers. Bacteria either enter seed potatoes and lower stems through wounds and injuries, or move directly from contaminated seed pieces to lower stems. Abundant moisture at the surface of the wounded tissue is needed for infection, and continued high humidity after infection favors spread of the disease in plants. Several kinds of insects may be involved in carrying the bacteria from decayed tubers to new seed pieces or shoots. The decay of seed pieces in the soil by fungi and other

Figure 1. A potato plant with a black, decaying stem typical of blackleg.

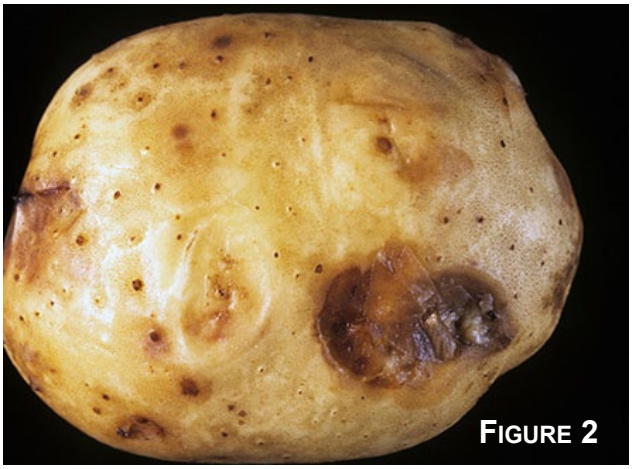

FIGURE 2. BACTERIAL SOFT ROT SYMPTOMS ON THE EXTERIOR OF A POTATO TUBER. **FIGURE 3**. A SLIMY INTERNAL DECAY OF TUBERS CAN OCCUR IN THE FELD AND IN STORAGE.

organisms may also provide conditions for blackleg disease to develop. Tubers harvested from plants that were infected during the growing season may develop a soft rot in storage.

Disease Management

Blackleg and soft rot are managed using a combination of cultural and chemical tools. Refer to ID-36 (commercial growers) and ID-128 (home gardeners) for more details on disease management strategies.

- Do not plant potatoes in the same location year after year.
- Plant in well-drained sites and avoid cultivation practices that allow water to stand in rows.
- Use quality seed pieces that are certified disease-free. Although seed certification programs do not screen specifically for blackleg, seed pieces free of other diseases may be at lower risk of developing blackleg in the field. Do not use saved seed.
- Plant whole seed tubers, if possible, to reduce seed-piece decay.
- Seed potatoes should be stored at 40° F; however, allow time for seed (whether whole or cut) to become physiologically active by warming at 65 to 70° F for 2 to 3 weeks before planting.
- Cut seed should be planted immediately into warm, moist soil.
- If planting is delayed, cut seed pieces should be allowed to cork-over before planting.
- Treat seed prior to planting with a recommended fungicide to control other seed-piece decay organisms (such as *Fusarium)* that can lead to blackleg.
- Maintain adequate levels of calcium in the soil during production. Tubers grown in low levels of calcium are more susceptible to soft rot in the field and during storage.
- Avoid bruising, wounding, and unnecessary exposure to the sun when potatoes are harvested.
- Potatoes that are washed should be dried before packing for storage. Wash in chlorinated water to reduce the amount of decay organisms on the tubers.

Additional Resources

The following University of Kentucky publications are available at county Extension offices, as well as on the Internet.

Home Vegetable Gardening in Kentucky, (ID-128) http://www.ca.uky.edu/agc/pubs/id/id128/id128.pdf

Vegetable Production Guide for Commercial Growers (ID-36)
http://www.ca.uky.edu/agc/pubs/id/id36/id36.htm

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Photos: Paul R. Bachi, University of Kentucky (figure 1); and Gerald Holmes, California Polytechnical State Universtiy, San Luis Obispo, Bugwood.org (figures 2 & 3)

Revised from the original fact sheets, *Blackleg Disease of Potato* and *Blackleg and Soft Rot Disease of Potato* (PPA-14), written by J.R. Hartman, W.C. Nesmith, and C.A. Kaiser

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