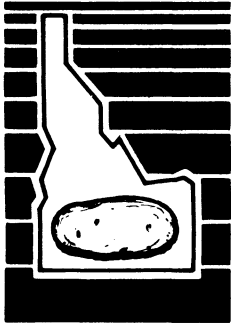




University of Idaho  
 College of Agriculture  
 Cooperative Extension Service  
 Agricultural Experiment Station

Current Information Series No. 262  
**LIBRARY** January 1975  
 APR 17 1975  
 UNIVERSITY OF IDAHO



# POTATO RING ROT

Arthur J. Walz, Earl F. Spencer  
 Harry S. Fenwick, Richard E. Ohms

Potato ring rot, caused by the bacterium *Corynebacterium sepedonicum*, can be one of the most disastrous diseases for both the certified seed potato grower and the commercial potato grower. The disease causes tuberrots, reduces yields, and saleable volume, increases grading and processing costs, and production costs per unit, and may render a crop unmarketable because of tuber decay by harvest time, during storage or in transit. The disease is regarded as so serious that one diseased plant in a field of potatoes grown for seed certification is cause for rejection regardless of the size of the acreage.

When ring rot is found in a seed lot, all potatoes grown that year by the individual from that lot of seed shall be rejected for certification even if grown in different fields.

## Symptoms

Ring rot symptoms vary in different varieties and within a variety. Symptom expression will also vary from year to year; with different temperature, soil fertility and

### To Avoid Ring Rot

1. Plant only certified seed or seed cleared for re-certification.
2. Clean all equipment with soap and water, then disinfect all potato equipment with live steam or a chemical. See Table 1.
3. Disinfect storage facilities. Remove all soil, potato refuse, sacks, etc. from cellar before disinfecting. If the cellar floor is dirt, remove 2 to 3 inches of soil, then disinfect. See Table 1.
4. Sterilize or destroy all sacks that may be used in your operation.
5. Destroy all volunteer plants that grow from the affected lot. Disinfect all tools and shoes before using them in a "clean" potato field. Lysol in pressure cans is good for disinfecting clothing and shoes.

S  
53  
E.322

moisture conditions; with different concentrations of organisms; with age of plants, and with time of season. Some infected plants do not exhibit any symptoms and they may or may not produce decayed tubers.

The Russet Burbank exhibits many different symptoms throughout the growing season. Plant symptoms may develop any time from soon after emergence until the end of the growing season. However, most infected plants break down after midseason.

### Leaves and Stems

Early symptoms are expressed in the leaflets and stems. The leaves may show a slight yellowing or mottling and may roll slightly upward. One or more stems in a hill may be dwarfed because of the short distance between the leaf nodes while the other stems are normal. Leaflets on the dwarfed stems appear rosetted, delicate, refined and velvety, and tend to be twisted or to form a half swirl. As the season progresses, the rosetted leaflets will become thin or will show marginal burning. Eventually they will wilt and die. This rosette formation may develop in the apical part of one or more stems any time during the season.

After midseason, plants that showed no early symptom will suddenly wilt and die. The fast wilt may affect one or more stems, or the entire plant may collapse. All the leaves on an affected stem seem to become thin and collapse simultaneously.

Infected plants or stems are hard to pull out of the ground. The stems are a dark green while the stems of healthy plants are a yellowish green. This deep green color in the stem remains evident for several days after the stems have collapsed and the leaves have turned brown. A creamy, cheesy ooze can be forced from the underground stem when it is cut at the junction of the stem and seed piece. The ooze should not be confused with bubbles that can be forced from healthy stems. The bubbles will disappear when the juice contacts the knife blade or thumbnails or when allowed to suck back into the stem. Ooze from ring rot stems will continue to show on the knife blade or thumbnails after repeated squeezes.

### Tuber Symptoms

Usually tuber symptoms are not detected until the stems begin to wilt. An infected plant may produce some

**Table 1. Suggested materials to use in preventing or cleaning up ring rot. All the materials listed below will destroy the ring rot bacteria if properly used.**

Chemical	Amounts to use for:		
	10 gallons	50 gallons	100 gallons
Quaternary Ammonium, Roccal, Hyamine, etc. 10% solutions	1.6 cups	2 qts.	10 gal.
Chlorine Chlorox, Purex, BK, etc. 5% solution	1 gal.	5 gal.	10 gal.
Lysol 50% solution in soap	1 gal.	5 gal.	10 gal.
Formaldehyde 40% solution	3.2 cups	2 gal.	4 gal.
* Copper sulfate	2 lb.	10 lb.	20 lb.

\* Copper sulfate is corrosive to metal so it should be used for disinfecting storage facilities only.

**Trade names are used only to identify chemicals as they are known in the marketplace. This does not imply endorsement by the University of Idaho or the USDA to the exclusion of other products that may also be available.**

tubers that are completely decayed, some that are partially decayed, some that are infected with no decay, and some that are not infected. Infected tubers when cut are less turgid and less crisp than healthy tubers.

The first tuber symptom is a slight softening in the vascular area in the stem end. This can be detected with a knife blade. Later, a whitish-yellow discoloration will develop in the vascular ring. This will become darker and more pronounced with time, and the decayed area will become cheesy. Pressure on the side of the tuber will force tissue out of the vascular area resembling toothpaste pressed from the tube. In advanced cases, the inside of the tuber will be completely decayed leaving only a shell. The inside may be cheesy, crumbly or a mass of slime.

Advanced tuber breakdown is usually accompanied by an irregular cracking of the skin when exposed to the air. The skin may also become slightly pinkish or somewhat brown. In storage, there is often a complete separation by a dark brown or black decayed area between the region inside the vascular ring and that outside.

Infected tubers that exhibit no symptoms are a source of contamination to healthy tubers during all handling, cutting and planting operations. Therefore any lot of potatoes infected with any ring rot should not be used for seed.

### ***Perpetuation of Ring Rot***

The bacteria causing potato ring rot live from season to season chiefly in tubers but can also survive in dried slime on grading tables, planting and harvesting equipment, potato sacks, storage bins, cutting knives and equipment. Ring rot bacteria do not live through the winter in soil but can survive in infected potatoes left in the ground which come up as volunteer plants the following season.

The primary source of spread is from tuber to tuber. Spread is mainly from contaminated machinery, cutting knives and storage bins. Dirty sacks can also carry the bacteria and they should be sterilized if they are to be used. The bacteria enter the potatoes through wounds and freshly cut surfaces.

### ***Control Recommendations***

In potato seed growing areas, sanitation is most important. All potato handling areas and equipment must be clean and sterilized. Plant only seed stocks with a continued clean record.

In commercial potato growing areas use only certified seed. Receive it in a clean, sterilized area and cut only on clean equipment. Steam clean all equipment at the end of the use period before storing for the season.

#### **The Authors**

Arthur J. Walz is Extension area potato specialist at Parma. Earl F. Spencer is assistant manager, Idaho Crop Improvement Association, Inc., at Idaho Falls. Harry S. Fenwick is Extension plant pathologist, headquartered at Moscow, and Richard E. Ohms is Extension potato specialist headquartered at Twin Falls.

Issued in furtherance of cooperative extension work in agriculture and home economics, Acts of May 8 and June 30, 1914, in cooperation with the U. S. Department of Agriculture, James L. Graves, Director of Cooperative Extension Service, University of Idaho, Moscow, Idaho 83843. We offer our programs and facilities to all people without regard to race, creed, color, sex, or national origin.