

Horticulture  
Section  
Vol. II, No. 4

April, 1944  
Colorado State College  
Fort Collins, Colorado

Misc. Series Paper No. 237, Colorado Agricultural Experiment Station

NOTICE ON CERTIFIED AND WAR APPROVED SEED

W. F. McGee

The regulations governing certification and war approved seed are about the same in 1944 as they were in 1943. Applications for both war approved and certified seed can be obtained from the certified managers or county agents and should be sent to the county agent or certification managers before May 1, 1944.

THE EFFECT OF ENVIRONMENT ON RHIZOCTONIA OF POTATOES

L. A. Schaal, U. S. Potato Experiment Station,  
Greeley, Colo.

The rhizoctonia disease of potatoes is caused by a fungus that lives over the winter on the seed piece and in the soil. The black fungus bodies on the seed tubers can readily be seen if the tuber is heavily infected or if the seed piece is moistened. Seed showing these sclerotial bodies should be treated before planting.

Even more important is the effect of environment on the development of the disease. Cool, wet soils favor the growth of the rhizoctonia fungus. It is in the early planted crop that the most damage occurs on the stems of young potato plants. The organism grows best at temperatures of about 60°-70° F., and it is in the early crop areas and in the higher mountain valleys that rhizoctonia does its maximum damage. The fungus, being present in most soils, may start to grow on the young shoots and girdle them even before the young plants are above ground. If the fungus is present also on the seed piece in the form of the black sclerotia, the amount of fungus inoculum present is increased and the chances of the fungus girdling the stems are increased. Seed treatment does not kill the fungus in the soil, but it may delay infection of the young shoot by virtue of the disinfectant carried over on the surface of the seed piece acting as a repellent to the soil-borne fungus mycelium.

Since rhizoctonia develops most readily in cool soils, it is best to plant shallow and then, as the soil warms, cover the seed pieces deeper by successive cultivations. The sandy soils warm up more rapidly than do the heavier black soils, and a 3½- to 4-inch depth of planting is recommended. As the soil warms up, more soil thrown over the seed until it is covered to a depth of 5 to 7 inches has given the best cultural control of this stem lesion phase of rhizoctonia disease. In the late crop area where plantings are made around June 1 to 15, the soil is by that date quite warm and above that temperature favorable for the development of stem lesions. Therefore, less trouble is caused in the late crop by the stem lesion phase of the disease.

The prevalence of rhizoctonia in the soil varies greatly from season to season. Such factors as competition of other soil-borne organisms appear to limit the number of the organisms found in the soil. When the soil temperature rises above 70° F., very little infection occurs on the stems. The sclerotial

infection of the tubers, however, may take place at temperatures above 70°F, but only after the tuber has ceased to grow. Mature tubers should not be left in the soil, in either the early or late crop areas.

## THE COMMON CAUSES OF SEED PIECE DECAY

✓ W. A. Kreutzer

Seed-piece decay, while not a major problem, frequently has caused heavy losses in stand in the State. The following outline gives some of the major causes of seed piece decay, together with suggestions which should aid in the prevention of seed-piece rotting.

### A. Diseased seed

Any infected seed pieces, irrespective of treatment, may rot following planting. Seed pieces carrying ring-rot, late-blight, blackleg, rhizoctonia, or fusarium infection are likely to rot following planting. Do not plant seed pieces showing any visible rotting.

### B. Healthy Seed

Healthy seed pieces may rot if precautionary measures are not followed. The causes of decay of healthy seed pieces are as follows:

#### 1. Inadequate healing or corking over

- a. If seed pieces are planted immediately following cutting in soil which becomes excessively wet or waterlogged, rotting may result. In order for cut surfaces to cork or heal properly, aeration (oxygen) is necessary. Waterlogged soil contains little oxygen. Unhealed surfaces are readily infected by soil organisms.
- b. If seed pieces are cut ahead of planting time, care should be taken to insure proper corking or healing of the cut surfaces. Piling seed in cellars under conditions where aeration is poor prevents proper corking over or healing. In addition, such piling causes heating which may cause death of tissues in the cut surfaces (slimy rot).

Although high humidity favors corking, aeration is also very important.

#### 2. Cutting seed tubers with a contaminated knife.

It is not advisable to use an ordinary non-disinfected knife. In addition to spreading ring-rot infection, a contaminated knife may introduce soft-rotting bacteria into healthy seed potatoes. Under favorable conditions these soft-rotting bacteria will rot otherwise sound seed pieces. Always use a disinfected knife to cut seed potatoes.

#### 3. Treating cut seed in strong disinfecting solutions

The treatment of cut seed in strong disinfecting solutions such as acid-mercury (mercurinol) is not recommended. In fact, treatment of cut seed in any dip disinfectant is somewhat hazardous. If seed tubers show sprouting or are not dried out properly after such treatment, rotting of sprouts or the seed piece may result. If a cut surface is injured by the chemical

used in the dip, soft-rotting bacteria or molds may easily become established in the tissue killed by the chemical and may eventually rot sound adjoining tissues.

✓ **A FEW SUGGESTIONS ON CUTTING AND HANDLING SEED POTATOES**

J. G. McLean and W. A. Kreutzer

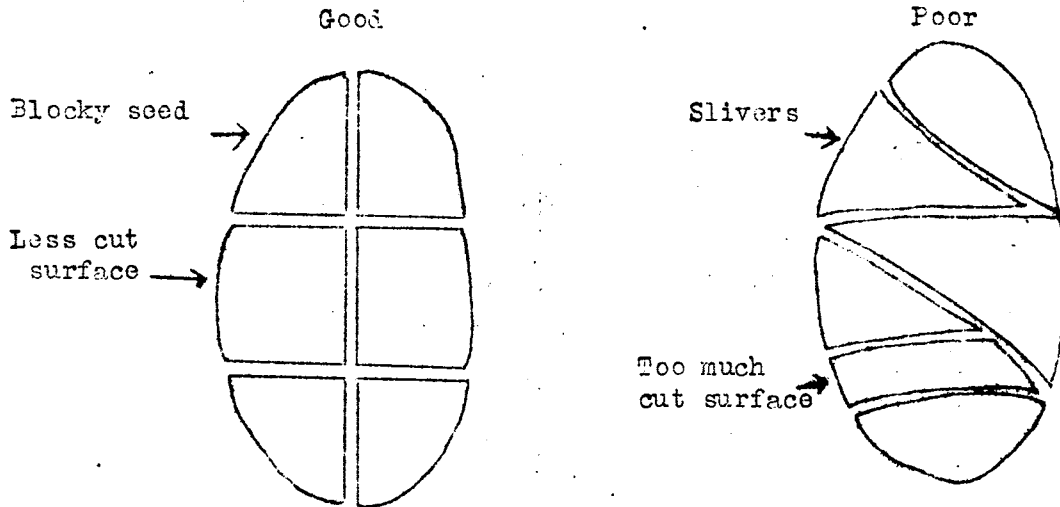
Reasons for cutting

In addition to the lack of enough whole seed to plant the potato acreage, cutting of potatoes has several advantages: (1) Cutting frequently speeds up germination so that the cut seed comes up several days sooner than whole seed; (2) Cutting breaks apical dominance (tendency of only one sprout to grow) in some varieties (Rurals and McClures).

Cutting seed

The disinfected knife should always be used to prevent the spread of ring rot and spindle tuber. Recent work by Dr. LeClerc shows that for every percent of spindle tuber present, approximately one-half percent of the yield is lost.

The most economical size of seed pieces has generally been considered 1 ounce to 1/10 of a pound. The seed pieces should be as square or blocky as possible. Slivers, or pieces with thin edges, don't heal properly. Seed pieces with too much cut surface are not advisable.



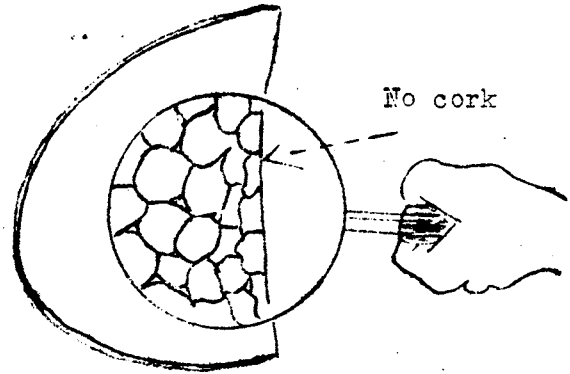
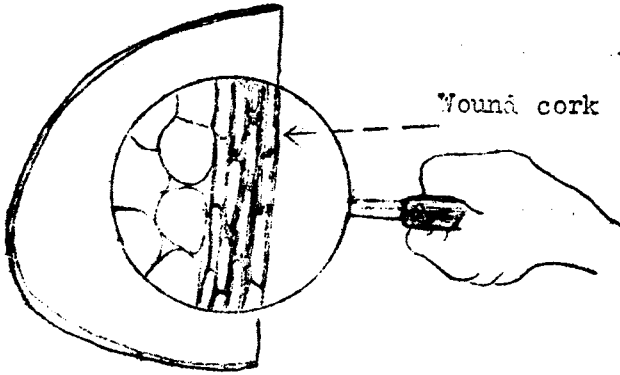
What happens to cut seed

If freshly cut seed is stored in a damp place at 70°-75° Fahrenheit and the bags are spaced so that air can circulate between them, the seed pieces will heal over. If the temperature is above 80° F or the seed is stacked too closely for ventilation, the seed pieces "heat" and show slimy rot which will continue in the ground. If the seed pieces are "dried out," they have a hard starchy surface but are not properly healed. A well-cared-for seed piece is as sound as a whole

potato. (Cut seed should be watched and turned or poured from one sack to another if there is any tendency to heat.)

A "healed" seed piece

A "dried-out" seed piece



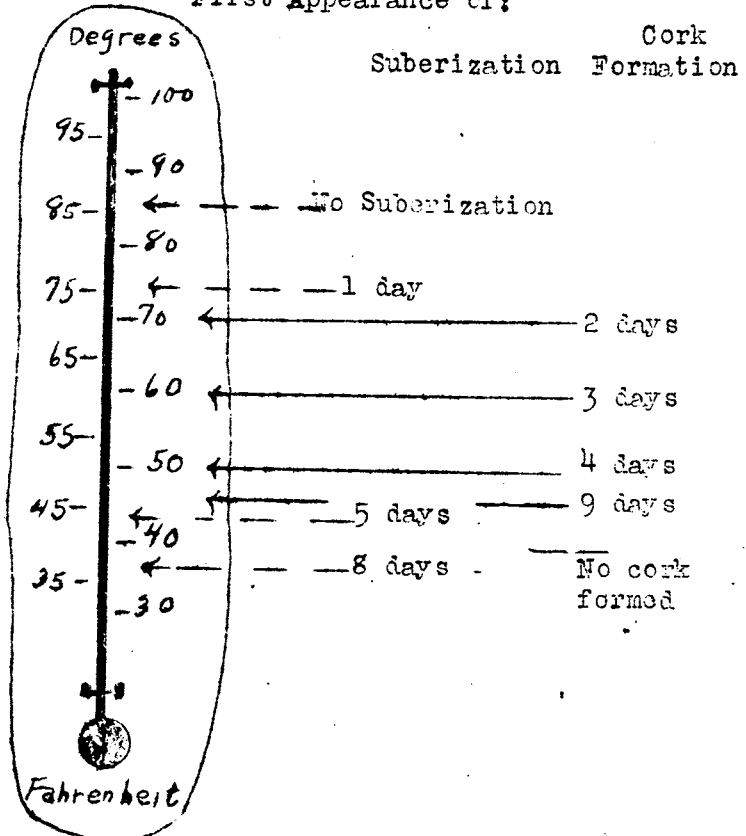
The well-cared-for seed piece first develops a waxy substance called suberin in the cells next to the cut surface. Then wound cork appears which is similar to the normal skin of the potato. These two processes of "healing" are necessary to protect the seed piece in the ground from rot fungi and bacteria.

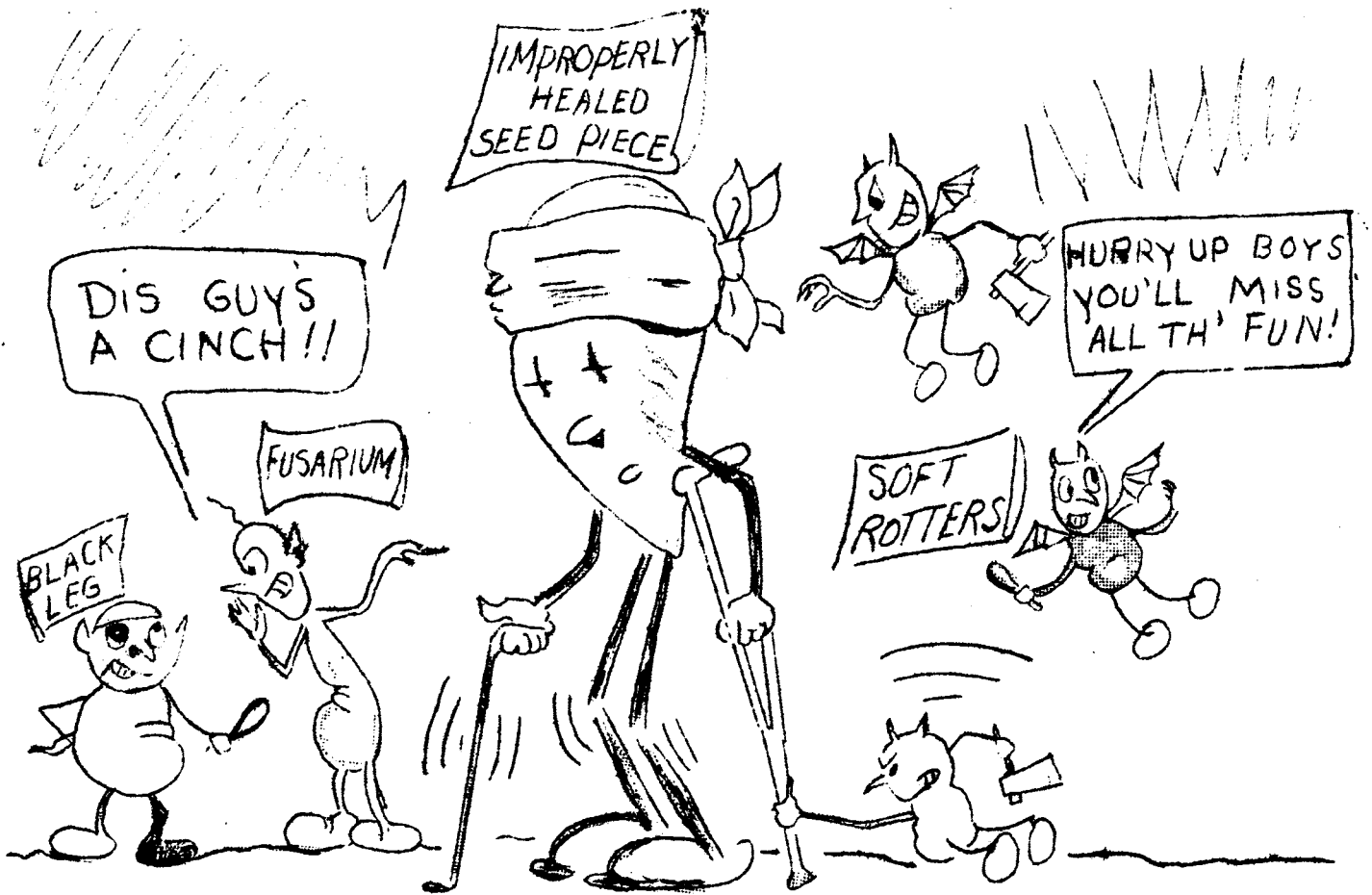
Freshly cut seed can be planted if the soil is moist and the temperature is favorable (see thermometer). In dry or cold soil, however, no corking will take place and more seed pieces will rot. Freshly cut seed should never be left in the sun or at temperatures above 80° F.

Time of healing

Irish Cobbler - Time Required for First Appearance of:

The time required for proper healing of tubers varies with the temperature, humidity, and the variety of potatoes. For Irish Cobbler cork formation has started in 2 days. Healing is rapid in Triumph and Cobbler but is slower in some of the other varieties. The Rural and McClure require 5 to 6 days for healing even with ideal temperature, moisture, and aeration.





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