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SIZE OF SEED and WHOLE VS. CUT SEED

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Size of seed is very important in potato production. Many factors have an important bearing on the size that is most economical to plant in different sections. Soil, temperature, moisture, fertility, and other soil conditions must be considered in determining the size of seed necessary for best results.

The planting of small seed pieces does not produce maximum yields, and may result in a light set and the development of oversized tubers. The moisture supply during the period of germination has an important bearing on the size and kind of seed piece to plant. If there is a limited supply of moisture in the soil at the time of and immediately following planting, a small seed piece, particularly if there is much cut surface permitting a considerable loss of water, may contain insufficient moisture and available plant food to produce a strong plant and maintain its growth until it can derive its moisture from the soil.

Large seed pieces (2 ounces and more) generally produce strong plants with more tubers of a desirable size. Smaller seed pieces give good results only under the most favorable conditions. When seed of liberal size is used, strong, sturdy sprouts and plants develop because of the larger amount of water and plant food in the larger seed pieces. The sprouts depend entirely on the moisture and plant food in the seed piece for growth and development until the roots form.

Poor stands are usually caused by seed-piece decay, which is generally more severe as the cut-surface area increases. Therefore, seed cut from large tubers requires more care in handling than that cut from small tubers. A 3- or 4-ounce tuber cut in half is more desirable than a seed piece of the same size cut from a large tuber. Seed pieces cut from the stem ends of large tubers of some varieties frequently have no eyes, and some basal eyes produce weak plants.

Some growers in the irrigated sections plant whole seed. One argument in favor of whole seed is that there is less danger of its rotting or drying out in the soil before the sprouts are rooted than there is with cut seed. If the soil is likely to be very wet or very dry after planting, whole seed will give the best results. It is also quite possible that less fusarium-wilt infection from the soil occurs in fields planted with whole seed.

Probably one reason why whole seed has not been more widely recommended for planting where it is known to have its advantages, is that good whole seed is difficult to obtain. The most common source has been the small tubers from commercial fields. Planting this seed results in an increased amount of diseased plants, generally offsetting the benefits of whole seed. Only whole seed from

B. Healthy seed

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

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 dominence (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

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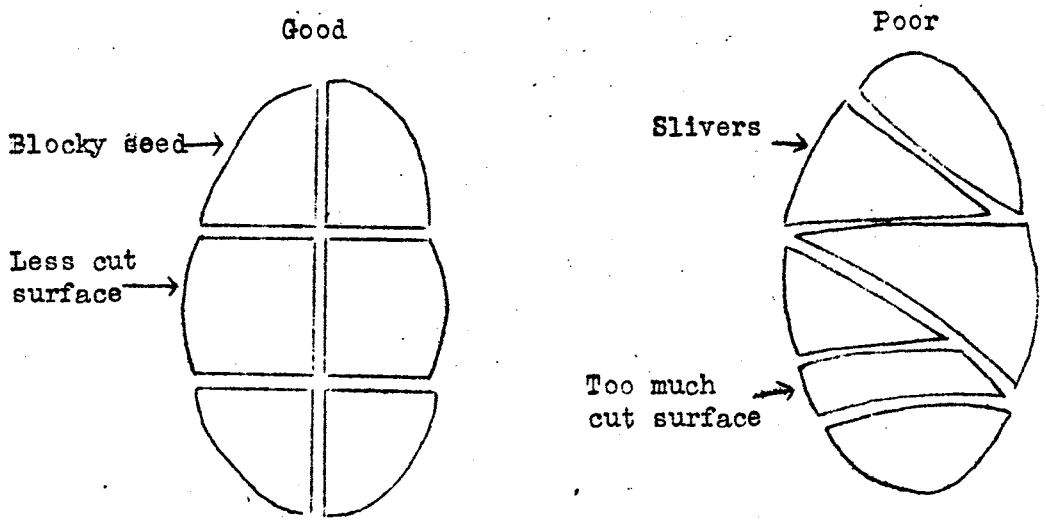
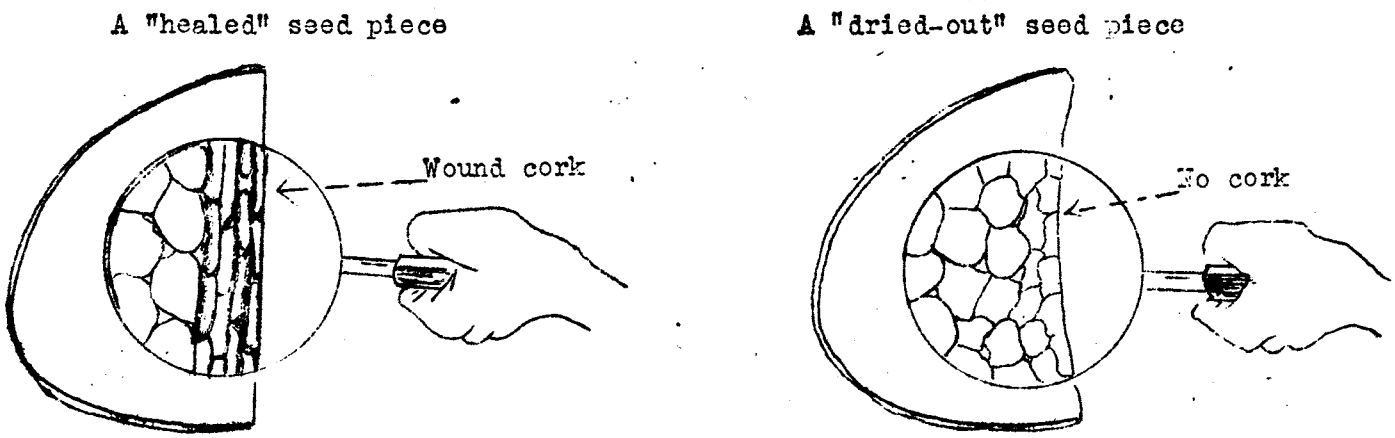
and spindle tuber. Recent work by Dr. LeClerg shows that for every percent of spindle tuber present, approximately one-half percent of the yield is lost.

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.)



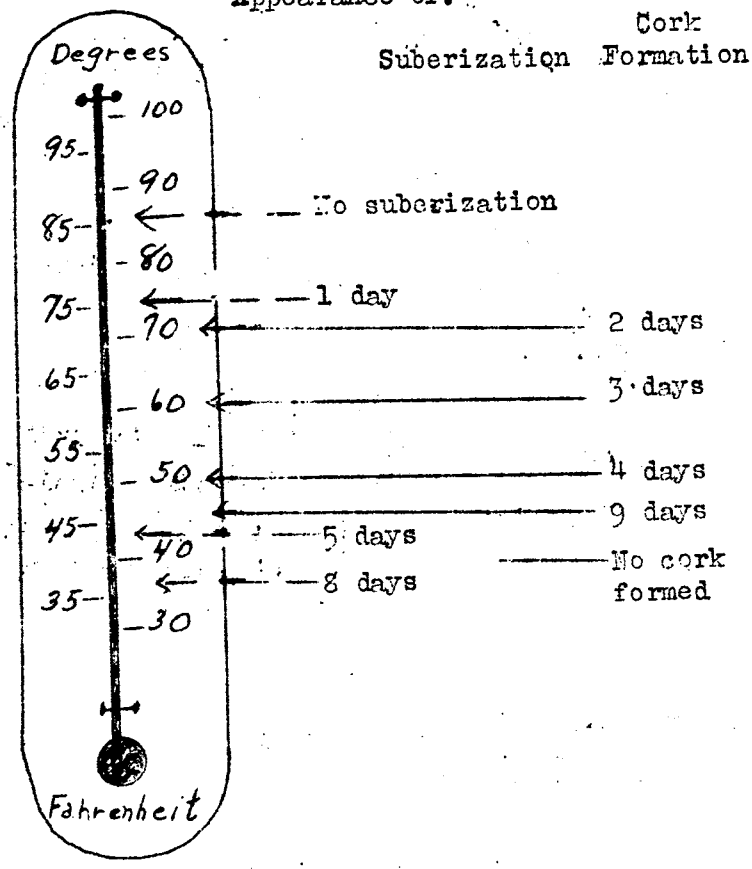
The well-cared-for seed piece first develops a waxy substance called suberin in the cells next to the cut surface. Then wound cork appears which is similar to

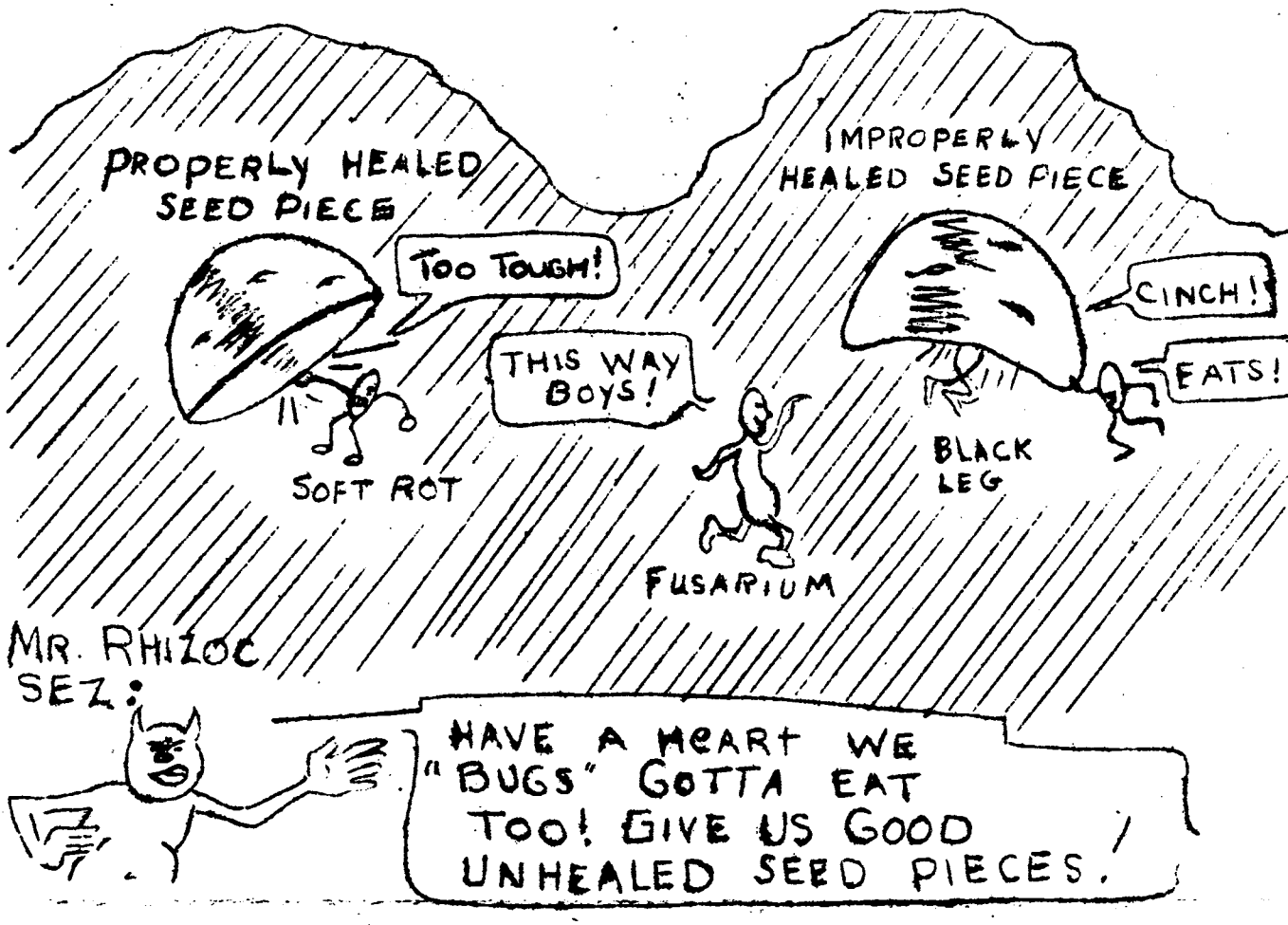
the normal skin of the potato. These two processes of "healing" are necessary to protect the seed piece in the ground from rot fungi and bacteria.

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

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. Rural and McClure potatoes require 5 to 6 days for healing even with ideal temperature, moisture, and aeration.





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