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Common Scab of Potato  
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# COMMON SCAB *of potato*

Cooperative Extension Service  
and the  
Agricultural Experiment Station  
MICHIGAN STATE UNIVERSITY



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POTATO SCAB was first identified in this country during the early 1890's. Since that time it has become one of the major disease problems in potato production.

## SYMPTOMS

Scab develops on tubers causing more or less circular lesions of variable depth depending upon the resistance of the potato variety infected. On susceptible varieties, lesions are often deep and may extend into the tuber one quarter of an inch. On more resistant varieties

they may be more shallow. At certain stages in tuber infection, lesions may have a raised appearance and be somewhat watery or soft.

Lesions on resistant varieties are superficial and may appear to be corky. Severe infection of resistant varieties may produce areas on the tuber which are leathery and rough.

Russet scab is a very superficial infection resulting in more or less russeted areas on otherwise white skinned tubers.

Infection of stems produces brown elongate lesions which may extend to

the woody tissue. Some roots may be killed, although root infection is not a commonly encountered symptom in the field.

Major loss from potato scab is reduced market quality because tubers are disfigured. Where severe, yields may also be reduced.

## CAUSAL ORGANISM

Common scab of potatoes is caused by a threadlike bacterium, *Streptomyces scabies*, which is capable of living in the soil. It grows on potato roots, underground stems, and tubers. It may survive on other plants and live in the soil for some time. This organism is extremely variable which may in some measure account for the differences in effectiveness of control measures at different locations and on different soil types.

Young, rapidly growing tubers are usually infected in areas where enlargement is most rapid. Scab infection commonly follows mechanical injury of tuber surfaces by insect larva.

## CONTROL

Control measures listed on this sheet have all been effective in some cases. Usually a combination of control practices should be adapted to the cultural methods used in the area.

## Resistant Varieties

Use of resistant varieties is the most effective control measure. Varieties with scab resistance have made it possible to produce a profitable crop under conditions that would not produce marketable potatoes with susceptible varieties.

Most early American potato varieties were susceptible to scab. Russet Burbank and Russet Rural were two excep-



Some varieties resist scab. See the deep scab on the Chippewa variety on the left, compared to the shallow scab on the typically scab resistant variety on the right.



tions as they had high to moderate resistance.

For the past 30 years, plant breeders in this country have been developing scab-resistant varieties with other good characteristics.

Here are some of the scab resistant varieties developed by the federal and various state breeding programs:

<i>Cayuga</i>	<i>Yampa</i>	<i>Early Gem</i>
<i>Seneca</i>	<i>Osage</i>	<i>Antigo</i>
<i>Ontario</i>	<i>Cherokee</i>	<i>Onaway</i>
<i>Menominee</i>	<i>Catoosa</i>	<i>Tawa</i>
<i>Superior</i>		

#### Slight to moderate resistance

*Sebago*    *Russet Sebago*    *Pungo*  
*Plymouth*

#### Crop Rotation

Scab-causing organisms may be present in soil where potatoes have never been grown. On the majority of potato soils, however, scab was probably introduced originally by using infected seed.

Scab tends to become more severe following frequent crops of potatoes or other plants which are susceptible to the scab organism. Sugar beets and red beets are the main offenders. Radishes, turnips, rutabagas, carrots, and parsnips are also susceptible to certain strains of the scab organism.

Rotations that contain such crops as rye, alfalfa, or soybeans have been reported to reduce the severity of scab.

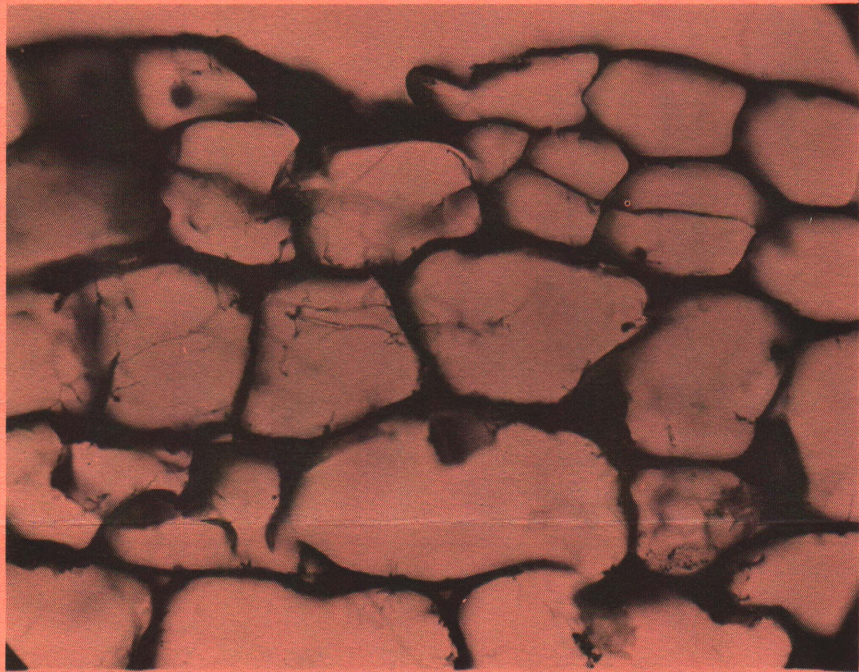
The length of time between potato crops has as great an influence in reducing potato scab as the particular crops grown in rotation. A rotation that separates potato crops by 3 to 5 years with non-susceptible crops provides satisfactory control in most localities.

#### Proper Soil Acidity

Scab is generally less severe in the more acid soils than it is in alkaline soils. Potato growers should avoid practices that increase alkalinity of potato land. When a grower needs to lime potato land for a legume crop or to correct some other soil condition, he should apply only the smallest amount of lime needed.

Generally a pH of 5.0 or slightly higher will control scab. The pH level at which potatoes grow satisfactorily and at which scab is reduced sufficiently will depend to a great extent on the soil type.

Sulfur applied to make soil more acid has had beneficial effects in many localities. Ammonium sulfate can also be used for this purpose.



Threadlike filaments of *Streptomyces scabies* in the cells of a potato stem.

**CAUTION.** Growers should be extremely careful to avoid making the soil too acid for growing potatoes or other crops. This warning is particularly important on lighter, sandier soils. (See your County Extension Agent for amount of sulfur to change pH.)

#### Other Soil Factors

Barnyard manure applied to the soil usually increases scab severity. The scab organism may persist for many years in fields that receive heavy applications of manure or in areas where barnyards had formerly been located.

Scab can attack tubers grown in soil with a temperature range of about 50 to 85° F. It is most severe in warm dry soil.

Generally scab is more severe in dry soils and becomes less severe in soils of higher moisture content. Exceptions have been pointed out by a number of investigators.

#### Soil Treatment

Besides sulfur, certain soil treating compounds will control scab. One of these materials is pentachloronitroben-

zene, sold under the trade name Terraclor.

This material has been used with some success in Europe and this country for the control of both *Rhizoctonia* and potato scab.

The rate of application presently allowed for potatoes is sufficient to control *Rhizoctonia* but not scab. It is anticipated that allowable rates will be increased when toxicity studies now being conducted are completed. Use only allowable legal tolerances as established by Food and Drug Administration.

#### Seed Treatment

Seed treatment for scab was tested intensively in the early part of the twentieth century. Results reported then were very promising. Field trials in the past 20 years have not given the same beneficial effects in reducing scab.

If a grower is planting a field that has never been used to grow potatoes or is known to be scab free he should use clean, scab free seed. This will help prevent the field from becoming infested with the scab organism.