Diseases of Potato: Common Scab
Best Management Practices for Potatoes
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BEST MANAGEMENT PRACTICES FOR POTATOES

Diseases of Potato: Common Scab

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INTRODUCTION

Common scab of potatoes, caused by the filamentous bacterium *Streptomyces scabies*, is found throughout the potato growing areas of Michigan. Although the disease rarely causes significant yield reduction in the field, large losses may occur due to downgrading and subsequent rejection of infested tubers. Once the disease has infected a field, however, scab likely will affect more and more of successive crops. Growers can begin to minimize the impact of scab by using the control practices suggested in this bulletin.

SYMPTOMS

The disease can express itself on tubers in three basic forms: Russet scab, shallow or raised surface scab, or deep pitted scab. The type of symptom expressed depends on the variety, pathogen virulence, and various cultural and environmental factors. In addition to causing tuber symptoms, *S. scabies* can infect roots, stems and stolons.

The first indication of scab is the appearance of small, brown lesions on young tubers. These lesions can then develop into one of the advanced symptoms. Russet scab is a superficial cork-like roughening of the tuber surface. Surface scab is expressed as more severe roughened patches on the tuber surface that form shallow depressions or slightly raised areas (Fig. 1). Surface scab lesions are typically corky in texture and usually similar in color to the rest of the skin. Pitted scab is expressed as lesions up to ¼-inch deep, and are often dark-brown to black. Scab lesions on the tuber tend to be roughly circular in shape, averaging about ¼-inch in diameter. Any of these lesions may coalesce to form larger, more irregularly shaped lesions.

Infection of young, rapidly expanding tubers occurs through immature lenticels or through stomata of tubers that have not yet begun to form a protective periderm (skin). Wounds, such as those caused by the feeding of insect larvae, can also serve as sites of infection. Once the periderm has matured, the tuber is no longer susceptible to infections, provided it remains unwounded. The disease does not develop further in potatoes in storage.

Fig. 1. Different types of scab (clockwise from top center): Russett scab, surface scab, surface scab, pitted scab, pitted scab.

SPREAD

Streptomyces scabies is a common soil inhabitant. Although most spread of the disease has probably come from the planting of infected seed, there is evidence that the pathogen, which will survive on decaying plant material in the soil, has been present in some areas prior to the introduction of potatoes.

CONTROL

Like many plant diseases, scab probably cannot be completely eliminated from an infested field. Despite the lack of a single cure-all for scab, a combination of cultural practices is usually effective for control.

1. Resistant varieties. Use of resistant varieties is by far the best control for the disease. Resistant cultivars express very mild scab symptoms when

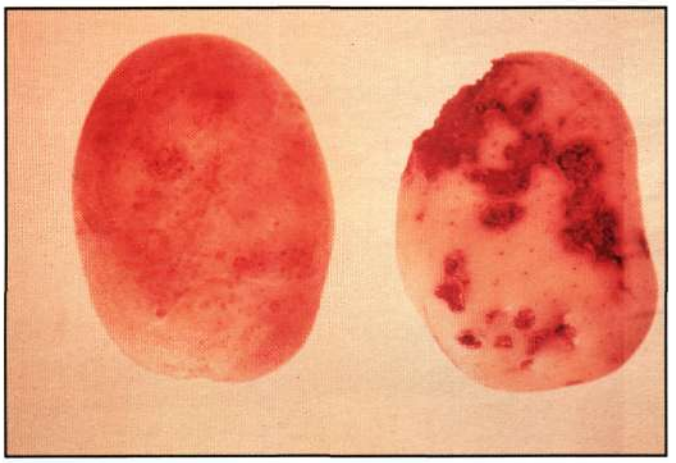

Fig. 2. A scab-resistant cultivar (left), grown in the same soil as a scab- susceptible cultivar (right).

compared to a susceptible cultivar (Fig. 2). Plant the most resistant variety that meets your needs. However, if the field has a high population of the pathogen, even the most highly resistant potato varieties may exhibit symptoms if conditions are favorable for disease. MSU Extension bulletin E-2222, "Selecting Potato Varieties for Michigan," provides information on cultivars resistant to scab.

2. Cover crops and crop rotation. Use of rye winter cover as a green manure prior to planting potatoes has been effective in reducing scab. In addition, rotations that separate potato crops by several years will help control the disease. Do not rotate potatoes with red beets or sugarbeets, radishes, carrots, turnips, rutabagas or parsnips, as these crops are also susceptible to scab. Avoid planting red clover prior to potatoes, because this can also increase scab severity.

3. Soil pH. Common scab does not generally occur in acidic soils that are at pH 5.0 to 5.3. Scab can be a serious problem, however, in soils at pH 5.5 to 7.5. Using an acid-forming fertilizer such as ammonium sulfate will help acidify soil and may decrease the severity of the disease. If lime needs to be added to a field, use only the smallest amount necessary, and apply following potatoes in the rotation.

4. Soil moisture. Scab is generally much more severe under dry, warm conditions. Since the scab pathogen attacks only the young, developing tubers, it is critical to maintain adequate soil moisture levels during early development. Using irrigation as necessary, keep moisture levels below 45 cb of tension (measured with a Tensiometer), from the start of tuber initiation (when stolon tips begin to swell) until the point when tubers have completed their initial formation and are beginning to put on size. This usually takes six to nine weeks, depending on the variety and environmental conditions.

5. Chemical control. No chemical control is available at this time.

6. Seed quality. Avoid planting scabby seed. This is especially important if you are planting into land that has been free of the disease.

7. Other factors. Do not use barnyard manure on potato fields - it tends to increase the severity of the disease. Do not dump scabby culls back into the fields.

For more information on potatoes, consult the following publication, available at your local Cooperative Extension Service office: *E-2222, "Selecting Potato Varieties for Michigan."*

This is one of a series of **Best Management Practices for Potatoes** bulletins designed to assist Michigan potato growers. These bulletins, a joint effort of the MSU Cooperative Extension Service and the Michigan Agricultural Experiment Station, are based on information and recommendations made possible through research supported wholly or in part by the Michigan Potato Industry Commission.

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