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Kern County Vegetable Crops

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COMMON SCAB OF POTATO

Common scab is a deforming disease of potato tubers that occurs in all the potato-growing regions of California. The scab does not affect total yields but the surface blemishes reduce the potato tuber quality and economic losses occur from the blemished tubers being unmarketable. Common scab is more of a concern for table stock varieties since appearance is important for this market. Superficial scab lesions do not really affect the marketability of processing potatoes; however, deep pit scab can increase peeling losses and impacts appearance of the processed product. The occurrence and severity of potato scab varies by season and from field to field. Cropping history, soil moisture, organic matter residue, and soil texture can affect the occurrence and severity of potato scab.

Common scab is caused by a widespread pathogen *Streptomyces scabies* (Figure 1). *S. scabies* is a common soil inhabitant of most soils. It can build up its population in the soil with successive host crops such as carrots, radish, spinach, and turnips. Potato scab lesions can be easily confused with powdery scab, which is a disease caused by an entirely different pathogen, the fungus *Spongospora subterranean* (Figure 2).

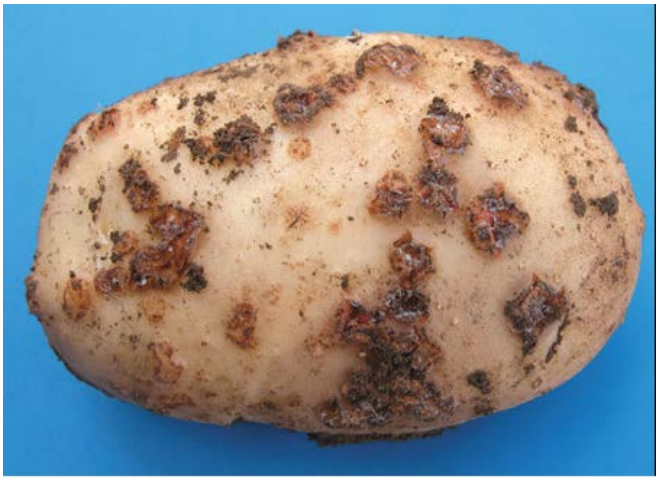

Figure 1 Common scab

Figure 2 Powdery scab

Infected tubers have brown, rough, irregularly shaped lesions that are quite variable and remarkable. The lesion can vary from a superficial corky area (russet scab) (Figure 3a) to a raised corky area (erumpent scab) (Figure 3b) to shallow or deep pits (pitted scab) (Figure 3c). The lesions may affect a part of the tuber or can almost completely cover it. The type of lesion that develops on the tuber surface is influenced by cultivar, strain of the pathogen, time of infection, and environmental conditions.

Figure 3 a. Superficial corky tissue **3 b. Raised corky area** **3c. Pitted scab**

Scab is more likely to be problematic in soils with pH 5.5-7.5. Common scab caused by *S. scabies* is controlled or greatly suppressed at soil pH levels of 5.2 or lower. Acid scab caused by *S. acidiscabies* seems to have a more limited distribution and occurs in soils below pH 5.2, as well as at higher levels. Common scab can be easily managed by lowering the soil pH but acid scab is only controlled by crop rotations. Lesions caused by common and acid scab are similar in appearance.

The pathogen infects potato tubers early in the tuber initiation phase (tubers are just developing). The pathogen enters the tubers through lenticels or occasionally through wounds on the tuber surface. As the tubers grow, the lesions expand and become more noticeable and develop into scab. Although the damage is usually not noticed until near harvest, the infection actually occurred early on. Inoculum from infected tubers can survive in soils and can infest the crop in successive seasons.

There are several management guidelines that can be followed to limit the damage and further spread of potato scab.

1. Use of resistant varieties: Potato cultivars differ on their resistance to scab and no variety is completely resistant. However, some varieties are more tolerant to potato scab than others. The resistance levels are usually listed in the variety descriptions. If possible, try to use resistant varieties in fields where scab is a problem. Ask your local farm advisors or other experts for variety recommendations.
2. Avoid planting seed potatoes infected with potato scab to prevent introduction of the pathogen into the field. Also, use seed treatments on all seed. Seed treatments do not eliminate the pathogen but will provide some disease suppression.

3. Careful crop rotations with nonhost crops will help to lower the level of the pathogen and will prevent the buildup of *Streptomyces scabies* in the soil. Use small grains, corn, or alfalfa in rotations to lower the population of the pathogen.

4. Maintain a proper soil moisture during tuber development. Keep the soil moisture just below field capacity during the 2 to 6 weeks following tuberization. Do not allow the soil to become dry at this time. Other bacteria will out complete *Streptomyces scabies* on the tuber surface if the soil has adequate moisture just below field capacity. This does an excellent job of controlling potato scab. Carefully monitor soil moisture conditions in the field during this growth phase as over watering can cause another set of problems for potatoes.

5. Maintain soil pH levels between 5.0 and 5.2 by using acid-producing fertilizers such as ammonium sulfate. Try to avoid lowering the soil pH below this level because nutrients can become unavailable if the pH level is too low. Also, avoid or limit the use of such alkaline-producing amendments as lime and manure, as these tend to increase the soil pH.

Although potato scab is a major problem when it occurs in a potato field, but by following proper strategies, it can be managed to a great degree.

Jaspreet Sidhu, Farm Advisor
Vegetable Crops
jaksidhu@ucanr.edu
Cell 661-304-8870
Office 661-868-6222

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Introducing Shulamit Shroder, your new information source for CDFA grants

Shulamit Shroder is the newest member of the Kern County UC extension office. Though based out of Bakersfield, her area also includes Tulare and Kings Counties. She specializes in the climate smart agriculture initiatives from the California Department of Food and Agriculture. She can help with the grant application process for the SWEEP, AMMP, and Healthy Soils Program grants.

- The State Water Efficiency and Enhancement Program (SWEEP) encourages farmers to install more efficient irrigation systems that decrease their water consumption as well as their greenhouse gas emissions. You can apply for a SWEEP grant for up to $100,000.
- The Alternative Manure Management Program (AMMP) awards funds - up to $750,000 - to livestock producers who decrease their methane emissions by changing the way that they manage manure.
- The Healthy Soils Program incentivizes the implementation of conservation agriculture techniques that decrease erosion and greenhouse gas emissions, like cover cropping, compost,
- crop rotation and mulching. For this grant, there is $75,000 available per project.

Keep an eye out for future announcements about grant deadlines - they have all passed but should reopen within the next year, pending further funding.

For more information about these programs and for help applying for these grants, contact Shulamit Shroder at: sashroder@ucanr.edu or 661-868-6218.