



SCAB OF CUCURBITS

Scab of cucurbits or vine crops is caused by the fungus *Cladosporium cucumerinum*. Scab is primarily a disease of cucumber, cantaloupe, honeydew melon, muskmelon, summer and winter squash, true and other pumpkin types, gourds, and West Indian gherkin. Watermelon, citron, and cassaba are highly resistant. In the absence of resistance, scab has resulted in 50 percent or greater losses in cucumbers during prolonged, cool and moist weather.

SYMPTOMS

Small water-soaked or pale green spots develop on the leaves. These spots, which are usually numerous, gradually turn white to gray and become angular. A yellowish halo may surround the lesion. The dead leaf tissue later cracks and tears away, leaving ragged holes in the leaves. Similar elongated spots (cankers) occur on the petioles and stems. Scab-affected leaves near the vine tips may be stippled with dead, yellow spots and stunted and crinkled. In cool (63°F or 17°C) moist weather the apical runner of young plants like melons can be killed.

The most conspicuous symptoms occur on the fruit. Small (1/8 inch), gray, slightly sunken, oozing, gummy spots develop that first resemble insect stings (Figure 1), later enlarge, and finally become distinct sunken cavities (Figure 2). When moist, the cavity is lined with a dark, olive green, velvety layer of spores (conidia) of the scab fungus. Some fruit cankers merge to form lesions one-half inch or more in diameter. On highly resistant fruits, especially on certain squashes and pumpkins, irregular, knoblike formations may develop. Affected fruits are often invaded later by soft-rotting bacteria that produce a mushy, foul-smelling decay. Scab is a common transit and storage decay of muskmelon and occasionally of late-planted squash.

DISEASE CYCLE

The scab fungus overwinters on the seed, in crop debris (especially squashes and pumpkins), and in soil in cracks about the greenhouse. The microscopic, mostly one-celled, cylindrical, ellipsoidal, spindle-shaped or subspherical, pale olive-brown conidia of the *Cladosporium* fungus—which form in long, branched chains—can remain viable after being blown long distances in moist air (Figure 3). Local dissemination occurs by means of insects, tools, farm equipment, and workers brushing against infected plants.



Cucumber scab on pickling cucumber (courtesy University of Minnesota).



Figure 2. Close-up of scab on cucumber fruit (courtesy British Ministry of Agriculture).

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Temperatures around 63°F (17°C) and alternating between 59° and 77°F (12° and 25°C), accompanied by moist weather, with frequent fogs, heavy dews, and light rains, are most favorable for scab development. The conidia germinate and penetrate susceptible cucurbit tissue humidity. Two or three 2-hour periods of 100 percent relative humidity on successive nights also favors infection. Upon exposure to spores, the number of new infections increases up to 30 hours of 100% relative humidity. Symptoms can appear 3 to 5 days after penetration has occurred. If moist, large numbers of spores may form in another day or two. Secondary disease cycles occur when these spores contact and infect susceptible cucurbit tissue.

CONTROL

1. Plant disease-free seed grown in arid areas of the Pacific Northwest. Treat seed with a protective seed treatment fungicide. Proper seed treatment also controls seedborne infections of the cucurbit diseases, including anthracnose, angular leaf spot, Alternaria leaf spot, Fusarium wilt, black rot or gummy stem blight, seed decay, and damping-off.
2. Wherever feasible, grow scab-resistant cucumber varieties. Most new varieties of pickling and slicing cucumbers now carry a single dominant gene for resistance. For more information on resistant varieties of cucumbers and other cucurbits check with your nearest Extension adviser for current copies of Circular 1373, Midwest Vegetable Production Guide for Commercial Growers and C1354, Illinois Homeowners' Guide to Pest Management. Both publications are revised annually. Also consult current seed catalogs and trade publications.
3. Plant in a warm, well-drained seedbed, free from surface run-off water.
4. Do not plant cucurbits in the same field or garden area more than once in 4 years. Rotate with unrelated crops. Avoid overcrowding. When possible, plant in fields where the temperature is relatively high and where good air drainage promotes rapid drying of the vines.
5. Follow a rigorous, weekly fungicide spray program to control scab in addition to anthracnose, downy mildew, and Alternaria leaf spot. Start spray applications before disease appears or when the vines begin to "run". Thorough coverage of all plant parts must be accomplished if desired control is to be achieved. Follow the spray programs outlined in Illinois Circular 1373. Try to apply sprays just before rainy periods when the majority of infections occur. Follow the manufacturer's directions regarding amounts to use, the interval between the last spray and harvest, and compatibility between fungicides and insecticides. Unfortunately, when weather conditions are optimum for scab infection, fungicides give relatively poor control.

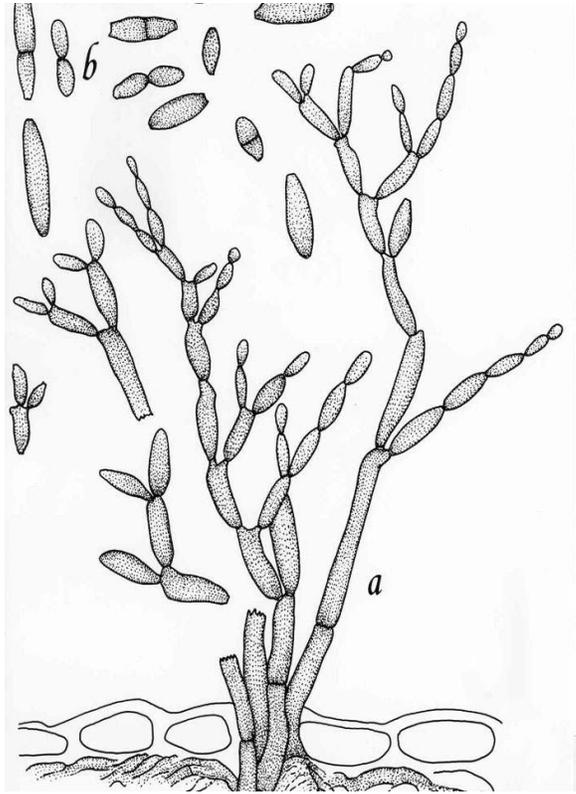


Figure 3. Cucurbit scab fungus, *Cladosporium cucumerinum*, as it would appear under a high-power microscope. (a) Four conidiophores have emerged through a stomate on a leaf, two bearing chains of conidia; (b) conidia. (Drawing by L. Gray).

6. Control all weeds, especially wild and volunteer cucurbits. Avoid cultivating or handling plants when they are wet with rain or dew. For current weed control recommendations refer to Illinois Circular 1354.
7. In the greenhouse, keep the vines dry by (1) maintaining the night temperature higher than that outside, (2) not sprinkling the foliage and overwatering, (3) keeping the day temperature in the 80's when feasible, and (4) keeping the air moving by fans, opening vents, etc. A temperature of 75°F (24°C) or above allows corking-over of scab lesions.
8. Where feasible, collect and burn or plow down all infected plant debris after harvest.
9. Control cucurbit insects by spraying at regular intervals with insecticides recommended by Illinois Entomologists in publications mentioned above.
10. Scab and other fungal storage rots of cantaloupe, muskmelon, squashes, and other cucurbits (caused by species of *Alternaria*, *Fusarium*, and *Rhizopus*) can be prevented by washing the fruit for 2 minutes in 2.5 percent Borax (sodium borate) solution at 110°F (43°C) or a 0.2% sodium hypochloride (Clorox) solution at 100°F (38°C). Fumigation for 5 hours in nitrogen trichloride is also effective.

Publications mentioned are available at your nearest Extension office or ITCS, P345 University of Illinois, 1917 S. Wright St., Champaign, IL 61820.