

Gladiolus Diseases

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Plant Pathology

Gladiolus diseases are caused by fungi, bacteria, viruses, and nematodes. Since many disease-causing organisms are carried on the surface or inside corms from year-to-year, you must handle corms carefully to save them over winter. Even if you purchase new corms every spring, you should inspect them carefully and give them special treatment before planting.

SPRING CORM TREATMENT

Examine each corm for evidence of decay or storage rot (see figure 1). Remove the husk to make inspection easier since this does not injure the corm. Destroy any corms that are badly damaged--they will not produce satisfactory plants and will only contaminate the soil and spread the disease.

SUMMER PLANT CARE

You cannot control diseases which originate in infected corms with fungicidal sprays during the summer. Instead, dig up and destroy abnormally shaped, stunted or discolored plants. Scab and mosaic probably are transmitted from diseased to healthy plants by bulb mites and aphids. A general garden insect control program should help prevent the introduction and spread of these diseases. See AG-FO-0852, *Controlling Insects in the Home Vegetable Garden*.

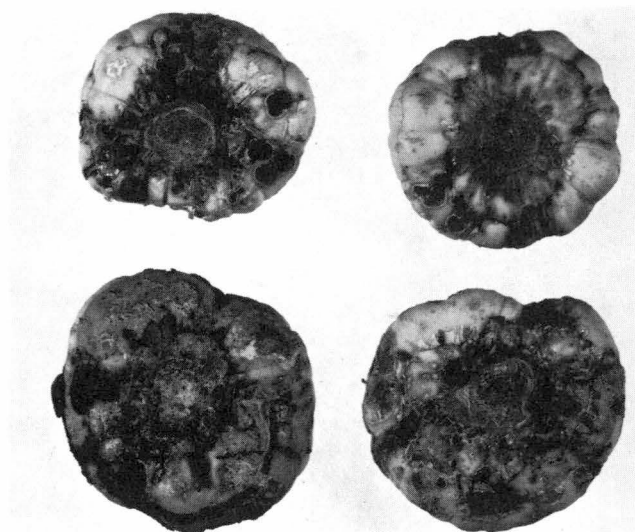


Figure 1. Scab-infected corms with characteristic sunken, circular lesions with raised margins.

Table 1. Registered fungicides and bactericides for Gladiolus.

Fungicide	Alternaria	Botrytis	Fusarium	Penicillium	Septoria	Stemphylium	Stromatinia	Pseudomonas	Xanthomonas
Benomyl (Benlate, Benomyl, Tersan 1991)		X	X	X	X				
Captan		X	X	X	X	X			
Chlorothalonil (Daconil 2787)	X	X			X				
DCNA (Botran)		X					X		
Fixed Coppers (Kocide, Champion)	X	X			X			X	X
Mamcozeb (Manzate 200)	X	X	X		X	X			
Mertect			X	X					
PCNB (Terraclor)							X		
Thiophanate (Topsin M, Cleary 3336)		X	X	X					
Thiram (Science Gladiolus & Bulb Dust)		X	X	X					
Vinclozolin (Ronilan, Ornalin)		X							

During rainy periods which last for several days, leaf blight diseases will develop. When these conditions bring on leaf blight diseases, you will have to use protective fungicides to prevent foliar or flower infections (see table). When spraying gladioli with protective fungicides, improved coverage and thus additional protection may be obtained by adding a spreader sticker or a detergent to the foliar sprayer.

FALL AND WINTER CORM TREATMENT

Dig corms about 4 to 6 weeks after flowering and preferably before the foliage normally turns yellow. Dig carefully to avoid injuring corms--*Penicillium* rot enters through wounds. Remove and destroy plant tops immediately.

Rapid drying is necessary when preparing corms for storage. Immediately after digging, place corms in shallow trays in a well-ventilated place, at 85 to 90 degrees, for 2 to 4 weeks. Sometime during this period, clean corms by removing dried parent corms and old roots. Sort out and destroy corms with rot or virus infection (see figures 1 and 2).

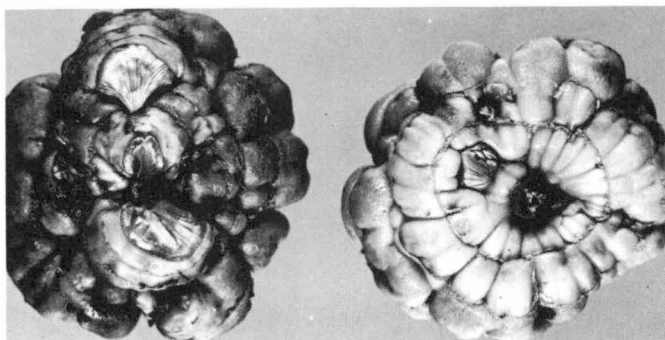


Figure 2. Warty appearance of corms infected with the white break mosaic virus.

Store clean corms at a temperature of about 40 to 45 degrees and a relative humidity of approximately 75 percent. Inspect corms several times during the winter and discard any with obvious signs of storage rot.

COMMON GLADIOLI DISEASES

Table 1 lists chemicals labeled for control for each disease discussed.

Scab

Scab infection on corm husks appears as elongated lesions with black rough margins. These lesions sometimes penetrate entirely through the husks. Lesions on corms are brown, approximately circular, and sunken, with distinct raised margins (see figure 1). A gummy exudate produced by the disease-causing bacterium *Pseudomonas marginata* may glue husks to the corms.

Fusarium Rot and Yellows

Corms infected with the fungus *Fusarium oxysporium* f. *gladioli* develop a dry rot in storage. Rot, not always visible externally, is often restricted to the corm base. When the corm is split in half, you might find radiating dark-colored streaks that extend from the corm base through the flesh. In severe cases the entire corm center is black and rotted.

Plants growing from infected corms may develop one or more of the following symptoms: bending or arching of young stalks, stunting, premature yellowing of leaves, and faded flower colors.

White Break Mosaic

Symptoms of this virus disease are most evident on flowers. Contrasting white or yellow streaking in normally dark-colored flowers is accompanied by crinkling, shrinking, and other deformations. In some varieties, corms are warty (see figure 1).

Plants developing from infected corms are stunted with spots (gray, yellow, brown, or gray to white and square shaped occurring between veins.) Symptoms, especially petal streaking, that are produced by feeding of insects (thrips), can be confused with the virus disease. But thrip damage usually occurs uniformly in a planting, while virus symptoms generally are evident on scattered plants only.

Penicillium Storage Rot

Wounded or scarred corms in storage can be attacked by the blue mold fungus, *Penicillium gladioli*. Corm surfaces sometimes are roughened by concentric wrinkles; rot appears as reddish-brown sunken spots. A green-blue mold grows over lesions.

Leaf Spots and Blights

The fungus *Botrytis gladiolorum* causes leaf spots, flower spots, stem rots, and corm rot. The leaf spots are small or large, irregular, and oftentimes have brown or gray centers covered with gray masses of spores. As the disease progresses, the tips of the leaves or the stem may turn yellow and die.

Infection of the stem near the soil line results in a basal stem and corm rot while the outer leaves of the above soil portion of the plant turn yellow and die. The fungus produces small, black, hard structures on dead plant tissue and on corms known as sclerotia. These sclerotia serve as survival structures for the fungus and can remain alive in the soil for years.

Infection of the flowers usually begins near the edges of the petals and appears as water-soaked spots. The spots enlarge rapidly and the flowers become slimy, turn a brownish color, and begin to droop. Under moist conditions the flowers are soon covered with a mass of gray spores.

Symptoms on infected corms include sunken, round, greenish-brown to dark-brown spots which may vary in size from pin-point to 1/2 inch in diameter. The corm may be partially rotted with brown strands radiating from the center of a cut corm. *Botrytis* may also cause punky, spongy decay of corms. Badly rotted corms are lightweight and often times covered with sclerotia.

Control of *Botrytis* involves applications of protective fungicides (see table 1). The plants should be sprayed during or prior to cool, rainy weather since these environmental conditions are conducive to disease development. Rouging of disease plants will help control the disease. Corm harvest should be done during dry weather as early as possible (see section on Fall and Winter Corm Treatments).

Stemphylium blight, caused by *Stemphylium* sp., is favored by high relative humidity with warm days and cool nights. Small light-green to yellow spots with a distinct red spot in the center form on leaves.

Bacterial leaf blight, caused by *Xanthomonas gummisudans*, is a problem in wet seasons. A sticky slime exudes from rectangular brown spots on leaves.

Stromatinia Corm Dry Rot

This corm disease, caused by the fungus *Stromatinia gladioli*, is more common during periods of cool, wet weather. Leaves produced by infected corms turn yellow prematurely and die. Small, reddish-brown, sunken lesions develop on the lower portion of infected corms. When an infected corm is cut in half, dark streaks can be seen radiating out from the core to the surface of the corm.

Stromatinia corm rot can be controlled by discarding infected corms, planting in well-drained soils, and harvesting corms during dry weather. Treating the soil and corms with Botran or Terraclor prior to planting will be beneficial.

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