

INSIGHTS ON DISEASES AND INSECTS OF GLADIOLUS

Revised by J. Lee Miller and Cliff Hartline, August 2013

Gladiolus are easily grown and the average home gardener will experience little trouble if he or she will use the best planting stock and practice general good gardening care. At the same time we must recognize the fact that every living thing, including human beings, is attacked from time to time by varying illnesses or diseases. When that happens it is wise to have a prescription for treatment. Good health habits are also important. What follows is a guide from gladiolus experts in case trouble threatens. Because practices and chemicals change periodically, as we go thru this chapter we will direct you to websites, which you can browse to locate information on problems and cures available today. By no means do we recommend any particular chemical or guarantee its effectiveness. Some of the websites may have direct reference to gladiolus and others may not be so specific and use the word "ornamentals". The sub-chapter on weed problems will be particularly useful should one decide to expand to a commercial or semi-commercial scale.

Gladiolus, like most other plants, are attacked by several disease pathogens and insects. There are root and corm diseases as well as leaf and flower spots. Insects include cutworms that hide in the soil, other *worms* (caterpillars) that chew leaves and flowers, and sucking insects such as spider mites, thrips and aphids. Diseases can be reduced or even avoided by planting healthy corms in *clean* soil not contaminated by residue from previous gladiolus plantings and by fertilizing and irrigating properly. In small plantings, insects such as Japanese beetles or cut worms can be removed manually while mites can be washed off with a stream of water. Google Japanese Beetles and Spider Mites for life cycle and control.

Disease organisms and nematodes carried in corms survive in many soils. It is advisable to plant in clean soil each time. When planting your glads rotate them to an area of your garden that has not been planted to glads for a few years. When digging your gladiolus corms in the fall, removing gladiolus debris from your garden area lessens the chance of any carrying over of disease .

Acknowledgements: Some of this information was obtained from articles written previously by:

R.O. Magie, J.F. Price and G.J. Wilfret

DISEASE SYMPTOMS AND CONTROL METHODS

Corms that are ready to plant should be plump and clean with healthy (not dark) root swellings. Corms that are shriveled, stone-hard in spots, or mushy, should not be purchased or planted. Husks should be peeled from corms and any corms that are diseased should be discarded. It is a mistake to plant corms with sunken brown spots. If the rotten tissue fades gradually into the healthy tissue when the corm is cut, the rot is probably caused by *Fusarium* fungi. Corms that produce long thin leaves that bend like cowhorns should be removed and destroyed to reduce contamination of the soil. The *cowhorn* symptom is typical of corms with *Fusarium* disease. The internal rot is always located on the side opposite the direction of the bend .

A small grower can control *Fusarium* corm rot by carrying out the following suggestions. It is a difficult disease to control because corms may carry incipient or latent infections and the *Fusarium* fungi live in soil, corms, and cormels indefinitely.

1. Corms that you purchase are usually not treated. It is advisable to dust or dip them with a labeled fungicide. At this time we will direct you to websites that give you specific information on diseases and chemicals. Google “*Gladiolus* diseases”. There are multiple websites but the University of Minnesota may be especially helpful.
2. Plant corms in a sunny, well-drained soil where *gladiolus* have not been grown for several years and where *gladiolus* refuge has not been discarded. Do not put diseased *gladiolus* in the compost pile. Destroy diseased plants by burning or deep burial.
3. Use a soil test to analyze the soil pH and soil nutrients. Follow the directions in the soil test to raise the soil pH to 6.5 to 7. Use nitrate nitrogen instead of all ammonium sources and never place fertilizer or manure and animal waste under or near corms. Fresh organic sources of nitrogen can cause an increase in *Fusarium* disease. Fertilize *gladiolus* at four stages of growth: 1) at planting; 2) at the 3-4 leafstage; 3) just as the spikes emerge from the leaves; and 4) after spike harvest. Google “*Gladiolus* Nutrition” for multiple websites.
4. As the *gladiolus* plants emerge mulching the area will help to conserve moisture and suppress weeds. Completely composted material or peat moss can be used for this purpose. Do not use uncomposted material, such as grass clippings. As it deteriorates it will increase disease problems. Keeping the soil loose with a very shallow cultivation saves moisture and discourages weeds.
5. Irrigate to keep soil moist but not wet; less the first month or two, and more as flower spikes appear.
6. Pull up and destroy diseased plants promptly. Also destroy late bloomers that are stunted, crippled, or have darker green leaves or a deeper petal color. Discard disease susceptible cultivars.
7. Dig corms before leaves turn yellow or brown, or as soon as it frosts. Separate the daughter corm and cormels from the shriveled mother corm. Wash the corms to remove excess soil and then dip or soak them for thirty minutes in a labeled fungicide. Before planting dip the corms in a labeled pesticide. Be careful to follow the EPA recommendations for personal protective

equipment and clothing. Google “Gladiolus Diseases”, University of Minnesota Extension. For the backyard gardener with the few practices mentioned above, most of the problems listed below would be of lesser concern.

Two of the worst gladiolus diseases are caused by fungi that survive many years in soil after being introduced from infected corms. **Fusarium** is a problem in warm soils and **Stromatinia** is a problem in cool soils. **Stromatinia** cause neck rot and stunting of plants and brownish to black spots on the corms. Most of the spots are on and near the leaf scars that ring the corm. Spots merge to form large dry rot spots.

Stromatinia dry *rot* is controlled by planting in non infested soil, by having the contaminated soil fumigated and by dusting the corms with a suitable fungicide. The dusting is done by shaking them in a dust-tight sack with just enough to cover them. In warm, rainy weather, oval brown spots may show up on young leaves and later be present on flowers and stems. If the spots penetrate to both sides of leaves, the disease is caused by the **Curvularia** fungus, In cool, rainy weather, a few large and many small, brown spots on the upper side of leaves only are caused by **Botrytis** fungus. The larger leaf spots and rotted florets develop a gray mold when moist. Both diseases can be controlled by preventive spraying, but adequate control is very difficult if either disease is allowed to spread before spraying is begun. Begin spraying as soon as the first spots are seen. If allowed to develop on plants, the diseases usually spread to corms, causing them to rot in storage. Disease spread can be reduced by avoiding the prolonged wetting of leaves. Sprinkler irrigation should be in the early morning when the wind and sun will dry the plants quickly, or water should be run between the rows to irrigate.

Root-knot nematodes attack roots and corms, stunting plants and making them more susceptible to root and corm rots. Nematode damage is much less in heavier soils than in the warm sandy soils preferred by large commercial flower and corm growers. Damage is reduced by rotating plantings and mulching the soil surface with tree leaves, pine straw, peat moss or other organic materials.

For large commercial gladiolus operations use of soil fumigation and nematicidal granules to control soil-borne disease, insects and nematodes is largely limited to people who are certified to purchase and use restricted-use pesticides and also to certified persons who are under the direct supervision of a certified applicator.

All of the diseases and nematodes previously mentioned can be carried in corms and cormels. Viruses are also carried in corms and cormels. Virus diseases may cause various symptoms such as yellow to white flecking and mottling of leaves and off-color blotching and streaking of flowers: Viruses are controlled by pulling and destroying affected plants promptly and by replacing affected cultivars with healthier and more tolerant ones.

INSECT AND MITE MANAGEMENT ON GLADS

There are many websites which will help you to control insects. Google “Bayer lawn and garden products” for information on thrip, and Japanese beetle, etc.. Google the specific insect.

Many companies list multiple insect control. Check the label for specific uses. We are not recommending any chemical or company, we are only directing you to websites for information. Google “Sevin” and “Orthene”.

Gladiolus growers want their flower spikes to be free of objectionable insects or mites or their damage. This can be achieved through applying several practical tactics of integrated pest control, such as practicing crop sanitation, planting pest-free corms, washing and hand picking pests from small plantings and scouting the crop weekly and applying pesticides as conditions warrant.

There are several insect or mite pests that regularly infest gladiolus. Since these may be expected in gladiolus production, growers should learn the practical methods to manage each and be prepared to take action as the season progresses. Below are presented the insect and mite pests that might be expected in a developing gladiolus crop.

Larvae of moths (Lepidoptera), such as the cabbage looper, corn earworm, and various armyworms, feed on foliage, spikes and florets of the gladiolus plant. The gladiolus is most vulnerable to attack when the plant is young and after the spike develops. When the florets are present, feeding of a single larva can render a spike useless. Hand picking *worms* from gladiolus can be a practical method of control when only a few plants are grown; otherwise, chemical measures may be required.

Japanese beetles can become serious pests, particularly in the North. These reddish-green beetles congregate on all above-ground gladiolus parts and in a short time can remove much of the plant's tender tissues. Traps for Japanese Beetles can be purchased at most garden centers. Gladiolus thrips often overwinter on corms and are taken to the field at planting or can overwinter in piles of discarded crop residues. These thrips then feed on foliage but cause their worst damage when they penetrate among the petals of developing florets and distort the tissue. Chemical treatment of corms before storage, hot water treatment of corms and destruction of old crop residues reduce chances of infestations during the growing season.

Flower thrips also attack gladiolus flowers but these thrips are not controlled by treating corms. Chemical control measures offer the only practical protection of a standing gladiolus crop from thrips.

Wireworms, larvae of click beetles, live underground, cut gladiolus roots and eat holes in corms. Soil fumigation for disease and

nematode pests usually eliminate problems from wireworms and other soil inhabiting insects.

In the spring and early summer a few winged aphids may arrive in gladiolus plantings. During the summer and throughout the year in the South, female aphids require no mates to produce young; all young produced are females. Aphids, having no egg stage outside the female's body, reach reproductive age very quickly. In moving among gladiolus plants aphids transmit viruses that cause mosaic diseases. In addition, aphid feeding distorts developing tissues and the aphid's honeydew excretions deposited on the host plant are unattractive and encourage growth of sooty mold fungi.

Numerous parasites and predators exist to control aphid populations, but too often, damage to the gladiolus spike occurs before adequate control takes place.

During warm dry periods mite populations may increase rapidly. Mites suck plant juices from cells and cause a loss of normal plant color and the collapse of petal and other tissues. Webs produced by spider mites, under outbreak conditions, may envelop the spike. Washing mites from gladiolus foliage may be practical in some circumstances, but more often is impractical.

Applying a granular systemic insecticide at planting will reduce the many insects that effect gladiolus and will reduce the number of sprays needed to provide adequate insect control. Many organic materials are available to control insects and disease. Use them wisely. Do not spray insect controlling materials on open florets or at times when pollinating insects are working the blooms.

When growers use any chemical on gladiolus for the first time, they should apply the material to a small portion of the planting and observe the gladiolus for several days. By this procedure, losses to phytotoxicity are minimized.

The pesticide label provides excellent information on the safe, effective and legal use of the product. Use only products that allow application to all ornamentals, all flowers or specifically to gladiolus; always follow label instructions.

Follow all information carefully on the websites mentioned above. We make no recommendations and websites should be checked periodically as use and safety recommendations can change at any time.

Acknowledgements: Some of this information was obtained from articles written previously by:

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