



Botrytis Blight of Tulip: *Botrytis tulipae*

Introduction

Botrytis blight or gray mold is a fungus disease which infects a wide array of herbaceous annual and perennial plants. There are several species of the fungus *Botrytis* which can cause blights; the most common is *Botrytis cinerea*. Botrytis infections are favored by cool (60°F or 15°C), rainy spring and summer weather. Gray mold can be particularly damaging when rainy, drizzly weather continues over several days. A Botrytis blight fungus with a strict host preference is *Botrytis tulipae* which infects tulip causing the disease known as tulip fire.



Figure 1: Tulip planting.

Symptoms and Signs

Tulip fire symptoms include leaf malformations and/or large, light tan patches on leaves. These patches are most noticeable on light-colored varieties. On leaves these infections are somewhat sunken, yellow to light tan, and surrounded by a water-soaked area. On colored petals the spots appear white and on white petals they appear brown. These spots can coalesce to blight entire

flowers or leaves. On stems the infections appear gray to brown and zonate or target-like; infected stems collapse.

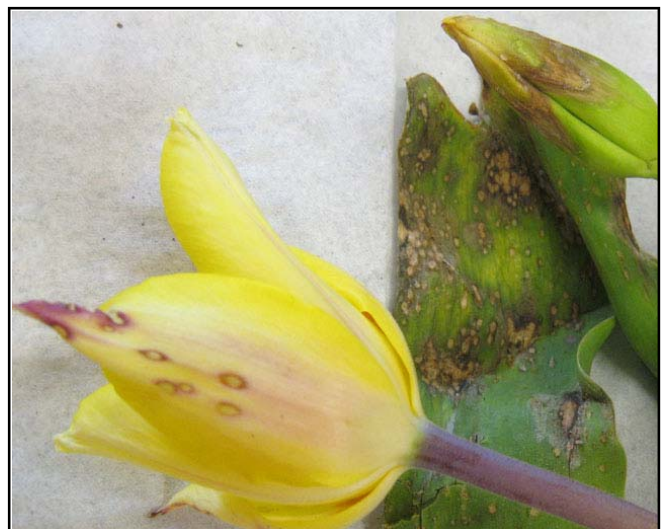


Figure 2: Spots on infected petals and leaves (provided by S. Jensen, Cornell University)



Figure 3: Close-up showing gray fungus on infected petal (provided by S. Jensen, Cornell University)

Outer bulb scales may also become infected and show yellow to brown, somewhat sunken, circular lesions. Small, shiny black sclerotia, resting structures of the fungus, may be found develop on rotting leaf, flower, stem, and bulb tissue.



Figure 4: Leaf tip symptom that may indicate infection of the root system and/or bulb (provided by S. Jensen, Cornell University)



Figure 4: Botrytis mold and sclerotia on infected roots of potted plants (provided by S. Jensen, Cornell University)



Figure 6: Close-up of sclerotia on infected bulb (provided by S. Jensen, Cornell University)

Disease Cycle

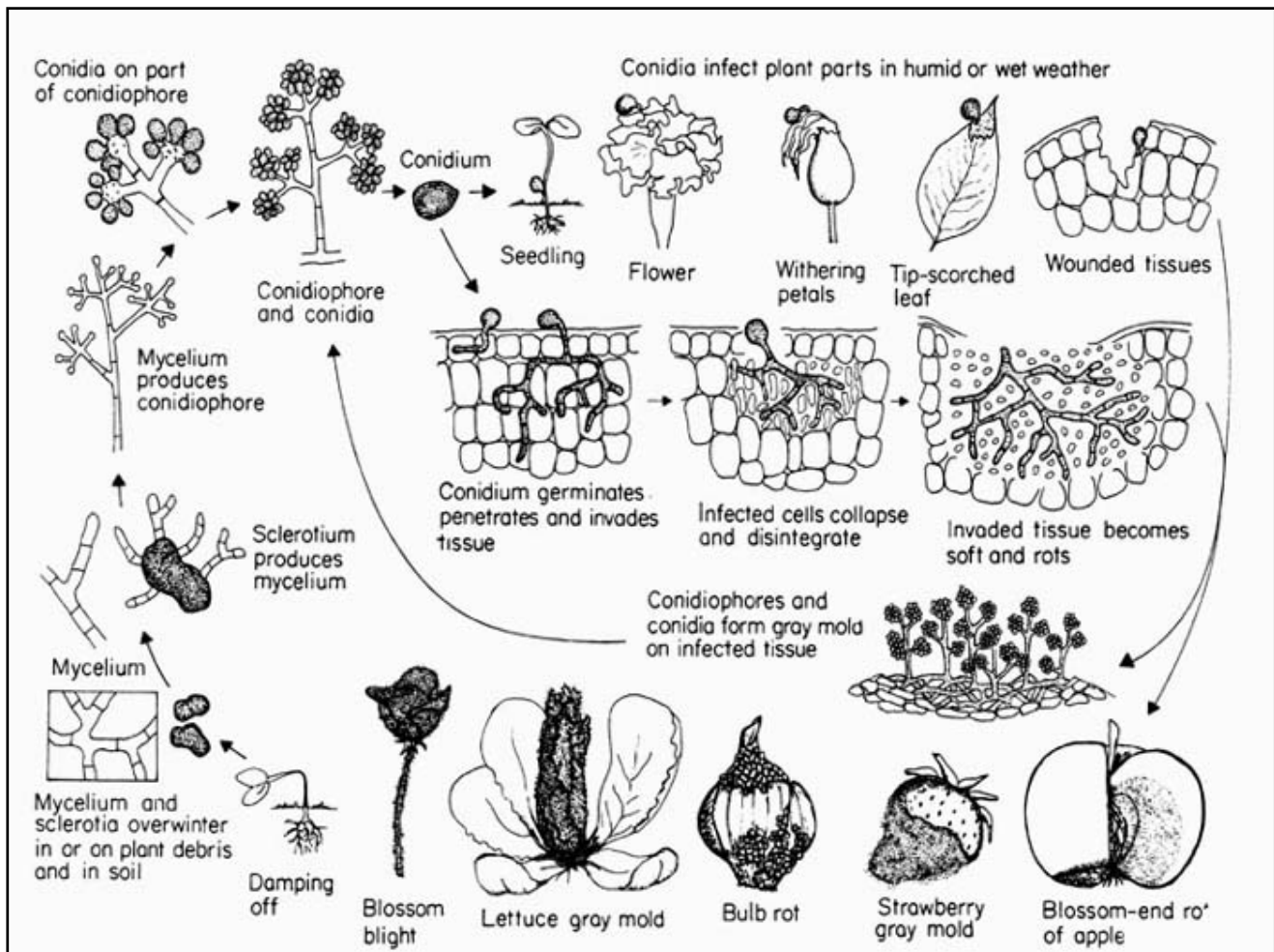
The fungus infects tulip leaves as they emerge in the spring. Patches of infected tissue turn tan, and spores are produced in these infected areas that will cause additional infections on leaves, petals, and stems. The fungus overwinters as sclerotia in infected plant debris.

Management Strategies

The best way to manage this disease is by inspection and sanitation. While inspecting plants carry a paper bag for sanitation. Remove faded or blighted flowers, blighted leaves, or entire plants infected at the base and place them in the paper bag so that they may be discarded with the trash or burned. It is best not to do any sanitation when plants are wet with dew or rain since this could spread fungal spores during conditions which favor infection. Likewise avoid overhead watering, syringing, or misting plants especially if Botrytis blight has been troublesome in the past. To promote rapid drying of plants space them to allow good air circulation.

Fungicide sprays may also help by protecting plants from infections. Apply these when spring weather is continuously cool and wet or if Botrytis blight has been a problem the previous year. Fungicides registered in New York State to try to manage tulip fire or Botrytis blight may include some copper products and some products containing the active ingredients neem oil or *Bacillus subtilis*. Other fungicides may be registered for use on different plants or groups of plants, so always make sure the plant which will be treated is also listed on the label of the product purchased. The label also contains information on how to apply the fungicide as well as any precautions. Additional products may be available for use in commercial plant production. Commercial applicators should refer to the appropriate pest management guidelines for more information.

When tulip fire is a problem, cut and remove fading flowers before petal fall, and cut and remove foliage at ground level when it yellows. Remove plant debris from the garden destroy or discard it. Apply the first fungicide spray when leaves are four inches high.



Development of Botrytis gray mold diseases.
 (provided by George Agrios, Plant Pathology 4th Edition)

With continuous inspection and careful sanitation gray mold can be effectively managed. Keep an eye out for the silvery-gray mold and/or tiny black sclerotia which are sure signs of this disease.

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READ THE LABEL BEFORE APPLYING ANY PESTICIDE! Changes in pesticide regulations occur constantly. All pesticides distributed, sold, and/or applied in New York State must be registered with the New York State Department of Environmental Conservation (DEC). Questions concerning the legality and/or registration status for pesticide use in New York State should be directed to the appropriate Cornell Cooperative Extension Specialist or your regional DEC office.

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