PP-233

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Homeowner's Guide to Fungicides for Lawn and Landscape Disease Management[1]

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Homeowners are generally discouraged from using fungicide products to manage diseases of the lawn and landscape for the following reasons:

- Fungicide products only help manage some plant disease, not all.
- Selection of appropriate products is dependent on knowing what disease is being managed—and that is difficult to do, based on visual appearance alone.
- Timing applications is tricky—in many cases the window of time, when best performance is likely, is narrow and recognizing that window requires close observation of the plant and environment; in addition, for some diseases, once symptoms have developed there is no available curative treatment and fungicide applications will help only with preventing spread to other areas.
- Measuring, diluting, and applying products effectively and safely requires attention to detail, some specialized skills, and equipment.

That being said, many fungicides are packaged and marketed towards homeowners, and when used appropriately, these can help manage some lawn and landscape diseases.

What is a disease?

Plants die for many reasons, not all are diseases. Many environmental stresses cause disorders that mimic diseases. For example, drought stress can kill a plant; this isnt a disease. Disease occurs when a pathogen infects a plant and disrupts growth or kills that plant over time. The most common plant pathogens include fungi, bacteria, and viruses. What else do you need besides the plant host and a pathogen to get disease?

Disease Triangle

Environmental factors influence disease development in the landscape. When the environment favors the host plant disease is unlikely to occur. When environmental factors favor growth of the pathogen and infection of the host, disease is

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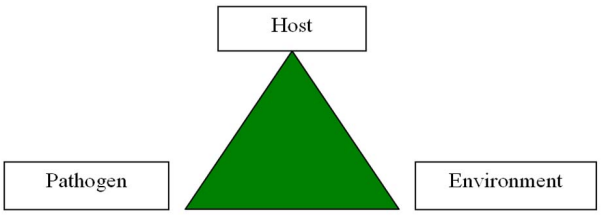
more likely to occur. All three sides of the disease triangle must be present for disease to occur: a susceptible host, a pathogen that can cause disease, and an environment favorable for infection and disease development.



Environmental factors affecting disease development include (but are not limited to) the following:

1. Temperature: fungal diseases occur over a wide range of temperatures.
2. Moisture: high relative humidity favors growth of fungal pathogens.
3. Wind: increases the spread of plant pathogens and the number of wounds on host plants.
4. Wounding: pruning and hedge trimming can create wounds where pathogens enter a plant.
5. Host: all plants are not susceptible to all pathogens, each pathogen has a host range.
6. Soil Type: sandy soils can stress plants because of a low moisture holding capacity while high clay levels can cause stress because of excessive water-holding.
7. Fertility: low fertility causes stress while excessive fertilizers can provide a flush of growth which is more disease susceptible.
8. Light: insufficient light can favor certain diseases.
9. Herbicides: can increase the severity of certain diseases.
10. Air Pollutants: can cause direct symptoms on the host and affect the pathogen.

Disease Diagnosis

Because of the wide range of problems that occur on the many plants in a landscape, determining which disease is affecting your plant or turfgrass is often difficult. Correctly diagnosing disease problems is critical because treatment recommendations are vastly different for different disease problems. To diagnose your plant disease problem you can:

- consult a lawn and landscape professional;
- consult a Master Gardener or other knowledgeable plant person;
- contact your county extension agent for help;
- submit a sample to the UF IFAS Extension Plant Disease Clinic (http://edis.ifas.ufl.edu/SR007).

Once you know what is causing the problem, you can determine how to manage and how to prevent the problem from occurring again.

Disease Prevention

A proper irrigation schedule, good fertilization regime, and planting the right plant for the right place reduces the chance of some diseases becoming a problem. Maintaining healthy and stress-free plants helps reduce the chance that your landscape will become diseased. Just like humans, plants are more capable of thriving and surviving an infection if they are healthy and not already plagued by stress. If new plants are being established in your landscape, take care to choose a strong and healthy plant that is not already infected with a pathogen. To do this, look for signs and symptoms of plant disease on the plant and root system. It is a good idea to only purchase plants from reputable and licensed nurseries. Inspect “bargain” plants carefully.

Even with the best cultural management regime, we cannot prevent all disease problems. Fungicides can be a very effective tool for disease management when the right product for the job is applied correctly and early enough in development of the disease. Plant diseases can spread to other susceptible plants in a landscape. Fungicides are most effective when used to prevent disease spread to healthy plants.

Fungicide Facts

Fungicides are chemicals which inhibit the growth of fungi. There are many different chemical active ingredients that work as fungicides. Some active ingredients are sold in several different products and formulations. After a homeowner has diagnosed the disease problem and has received a fungicide management recommendation, it is important to carefully consider pesticide safety and selection.

Fungicides can be classified by how they work on the fungus and how they work on the plant. Products that work in a similar way on fungi have the same mode of action (also referred to as chemical family or class). Contact fungicides are sprayed onto plants and act as a protectant barrier from pathogen infection. They prevent infections from occurring when applied before symptoms are visible, but infections that have already occurred will continue to develop. Systemic fungicides move into the plant to some extent depending on the chemical. Some systemic products exhibit curative action which means the disease is stopped at the current state of development.

All pesticides sold in the United States are required by law to have a label; the label contains a wealth of information about the product including instructions for use, application and storage, the plants the product can be applied to legally, and the diseases the product is effective against. Any use of a pesticide that is not in accordance with its label is illegal.

Some fungicide products are labeled for bedding plants, shrubs, trees, and other ornamental plant uses in the landscape but not turfgrass and vice versa. As older active ingredients are re-examined by the EPA, uses that include residential turfgrass are often scrutinized and removed from labels of products. Existing stock of product is usually allowed to be sold for a few years after label adjustment. During these transitions, both old and new products (with different sites on the labels) could be available in the marketplace. Situations like this are confusing and reinforce the need for users to carefully read and follow product labels.

Fungicides available at local garden center retailers are available to the general public and are marketed towards the homeowner or private pesticide applicator. Lawn and landscape care companies who offer fungicide services, do so under the supervision of certified pesticide applicators. Some professional products are illegal for homeowners to apply; others are packaged and marketed such that they are not available to the general public because of package price and availability. Not all products are safe to apply to all plants. Check the labels of products for instructions on how to determine safety on your plants.

Employing a lawn and landscape service for fungicide applications is the best choice for all homeowners. For those determined to make their own applications, please use caution and make informed decisions.

Table 1. Fungicide products marketed toward homeowners for control of landscape plant diseases are listed below. Availability varies. These products are generally available at reasonable prices and in small quantities, but often contain some of the same active ingredients as products marketed toward professional pesticide applicators (see Table 2).

Common Name	Brand Name*	Turf**	Orna.
Captan	Hi-Yield, Bonide	X	X
Chlorothalonil	Ortho, Hi-Yield, Bonide, Monterey, Dexol, Fertilome		X
Chlorothalonil + Diazinon	Fertilome		X
Copper Ammonium***	Fertilome		X
Copper Hydroxide	Fertilome, Hi-Yield	X	X
Copper Sulfate	Hi-Yield, Dexol, Bonide		X
Fosetyl-Al	Monterey	X	X
Lime Sulfur	Bonide, Hi-Yield		X
Maneb	Hi-Yield		X
Myclobutanil	Spectracide	X	X
Neem Oil	Bonide, Green Light		X
Phosphorous acid	Monterey	X	X
Potassium bicarbonate	Bonide, Monterey		X
Propiconazole	Fertilome, Bonide		X
Quaternary Ammonium	Hi-Yield, Parkway	X	X
Sulfur	Green Light, Fertilome, Hi-Yield, Safer, Bonide		X
Tebuconazole	Bayer Advanced		X
Thiophanate Methyl	Green Light, Fertilome, Scotts, Bonide		X
Triadimefon	Green Light, Hi-Yield, Bayer Advanced, Bonide	X	

*Name of the company that produces the fungicides, the company assigns one or more trade names to the individual product based on the chemical composition and intended use
**Products without turf sites on the label may not be applied to lawns.
*** Copper products may burn turf and ornamental plants, check the labels.

Table 2. The fungicide products below are marketed toward professional pesticide applicators and have residential sites (ornamentals or turf or both) on the label. These products are sold in larger quantities (at much higher unit prices) than those in Table 1. Homeowners are prohibited from using some of these products on their labels. However, lawn and landscape professionals may be able to offer applications of these products as a disease management service to homeowners.

Common Name	Trade Names*	Turf**	Orna.
Azoxystrobin	Heritage	X	X
Captan	Captan 50W	X	X
Chlorothalonil	Daconil Ultrex, Chlorostar VI F, Concord DF, Manicure, Chlorothalonil DF, Echo 720		X
Chlorothalonil +Thiophanate Methyl	Spectro 90WG, Consyst WDG		X
Chlorothalonil + Zinc	Daconil Zn		X
Copper Hydroxide***	Champion WP, Kocide 2000 TNO		X
Copper Hydroxide + Mancozeb	Junction		X
Copper Sulfate	Basicop		X
Fludioxonil	Medallion	X	X
Flutolanil	Prostar 70 WP, Contrast 70 WP	X	X

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Iprodione	Chipco 26019, 26 GT	X	X
Mefenoxam	Subdue Maxx, Mefenoxam 2	X	X
Myclobutanil	Eagle 40WP, Systhane WSP	X	X
Neem Oil Extract	Triact 70		X
Phosphorous Acid	Magellan, Alude	X	X
Potassium Bicarbonate	Armicarb, Kaligreen	X	X
Propamocarb hydrochloride	Banol	X	X
Propiconazole	Banner Maxx, Propiconazole Pro	X	X
Sulfur	Sulfur 6L	X	X
Thiophanate methyl	3336 WP	X	X
Triadimefon	Bayleton 50, Strike 50 WDG	X	X
Trifloxystrobin	Compass	X	X
Triflumizole	Terraguard 50		X

* Where multiple trade names are listed, consult the label to be certain the fungicide is applied to the appropriate plant and site

****** Products without turf sites on the label may not be applied to lawns.

*** Copper products may burn turf and ornamental plants, check the labels.