

Contact vs. systemic fungicides

► Contact fungicides are an older type of fungicide also known as protectants that intercept a fungus and prevent it from attacking or getting inside a grass plant. They don't penetrate plant tissues but inhibit fungi by interfering with the growth and development of fungi in a number of ways, i.e., multiple site inhibitors. This creates a very low risk that fungal resistance will develop.

► For a fungus to develop resistance, it needs to change its DNA. But contact fungicides are toxic to many different fungi, including many non-target fungi that are beneficial to your turf, and they must be applied frequently.

► Systemic fungicides "move" once applied to the turf and redistribute inside the plant. Some fungicides are locally systemic; meaning they only move a few cells away from the point of entry. A carrier is a material upon which the active ingredient is loaded, for the application and the carrier itself can have fungicidal activity and can greatly affect how the active ingredient reacts and enters a plant.

► Generally systemic fungicides require 3 to 5 days to become fully effective. To be effective, the disease severity at the time of application must be low, so it is important to scout your turf and look for the start of disease. — *Hank Wilkinson*

CONTACT FUNGICIDES^a

Common name	Trade name	Chemical class
captan	Captan	carboximide
chloronebb	Terraneb SP	chlorinated aromatic
chlorothalonil	Daconil	nitrile
etridiazole (ethazole) ^b	Terrazole, Koban	triazazole
mancozeb	Fore, Manzate	ethylene bis-dithiocarbamate
PCNB (quintozene) ^b	Turfcide, Terraclor	chlorinated aromatic
thiram	Spotrete	dithiocarbamate

a Also known as "protectant" fungicides. Contact fungicides remain on plant surfaces and don't penetrate into tissues. All are multi-site inhibitors and have low risk for supporting fungal resistance development.

b Purported to have some systemic activity.

COURTESY OF R.T. KANE AND H.T. WILKINSON

Why fungicides fail in ornamentals

By Bal Rao, Ph.D

Generally, fungicides fail because of the conditions to which they're exposed. Unreasonable expectations can also cause someone to call a fungicide application a failure. By following label specifications and using the process of elimination, you should be able to narrow down or identify the cause(s) of disease management failures. This will help you develop effective disease management strategies and correct or improve future failures.

Some of the following factors may be responsible for poor disease management on ornamentals.

- Not following label specifications
- Not knowing the disease or plants well through improper identification or not understanding resistance, plant sensitivity, disease characteristics or pathogen life cycle.
- Product failure due to improper selection, slow activity, low concentration, failure to penetrate surface, solvent causing phytotoxicity,

product age or photodegradation or other breakdown, incompatibility of products, limited activity, short residual effect, label limitations or heavy disease pressure.

■ Misunderstanding treatment methods by miscalculating active ingredient, improper or faulty mixing/cleaning, failure to add surfactant or other agents, failure on application, failure to water in, improper equipment or calibration, no follow-up applications, poor plant uptake, rain wash-off, wind drift, soil conditions, improper storage.

■ Poor timing in application related to pathogen's life cycle, degree days, extended cool and moist periods favoring disease developments, activity after residual is gone or multiple flushes of pathogen growth.

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