



Why Fungicides Fail

Many factors may affect success of fungicide application. On certain occasions, fungicide applications fail to manage the targeted disease. The following are possible factors that affect fungicide application success or failure.

Diagnosis and Fungicide Selection

One reason for fungicide failure is inaccurate disease diagnosis. Common problems that may be misidentified as fungal diseases include insect damage, chemical injury, bacterial diseases, nematodes, and environmental damage. Fungicide applications do not affect problems due to these causes.

However, even if the problem is accurately diagnosed as a fungal disease, there are some fungicides that will not manage all fungal diseases. Without proper diagnosis, a fungicide may be selected that does not manage the targeted disease. Fungicide labels specify the disease organisms that are controlled by the specific fungicide.

Outdated or improperly stored fungicide materials may lose their activity and fail to work. Fungicides stored longer than 2 years or in inadequate conditions (such as freezing) may lose their activity. Some flowable formulations of fungicides tend to settle out in their containers over time. To help assure the proper dosage of active ingredient, containers must be thoroughly mixed before dispensing the fungicide into the sprayer.

Fungicide Rates and Proper Mixing

Fungicides should be used at recommended rates for effective disease management. Fungicide label rates are based on multiple year and location testing to establish the most effective rates under a wide variety of environmental conditions.

Treatment area and the amount of product to add to the mixing tank should be carefully calculated. Errors in calculation can result in ineffective disease control or excessive fungicide bills.

Mixing fungicides with too acidic or alkaline of water can reduce fungicidal activity, especially for water with a pH greater than 8.0. Ideally, water with a pH near 7.0 should be used for mixing pesticides. If water pH is not favorable, it can be corrected with pH buffers that are added to the water before mixing in fungicides.

Mixing multiple pesticides in a spray tank can save time but compatibility of products should be tested. Incompatibility can result in the formation of insoluble precipitates in the spray tank. Fungicide labels often contain information on mixing compatibility. If the label does not address compatibility, a small volume of the spray mix may be tested in a glass jar for 30 minutes; separation or settling of pesticides in the jar indicates incompatibility.

The order that pesticides of different formulations are added to the tank also may affect compatibility. Different formulations of pesticides should be added to the tank in the following order: wettable powders, flowables, solubles, powders, surfactants, and then emulsifiable concentrates.

Fungicides begin to lose their activity if they sit too long in the spray tank. Fungicide activity often declines within 12 hours after mixing, and this process is accelerated by poor water quality (sediment, high or low pH).

Sprayer Calibration and Application

The most common cause of fungicide-application failure is incorrect sprayer calibration. If a sprayer is not properly calibrated, too much or too little fungicide can be applied, which can result in fungicide toxicity or unmanaged disease. To avoid these problems, sprayers should be recalibrated after any modification to nozzles, pressure, or speed. Also, the fungicide should be applied in the recommended volume of water, at a constant speed, and at the recommended pressure. Spray pressure should be adjusted for the nozzles used. Excessively high sprayer pressures result in small droplets that may drift. Calibrating and adjusting a sprayer takes time and effort, but it can save money and make fungicide applications more effective. The boom width should be carefully measured and drive rows adjusted to avoid sprayer misses or overlap between field passes.

Environmental Considerations

Weather forecasts help predict success of a fungicide application. A general rule for length of time of application before rainfall: systemic fungicides need a minimum of 3 hours on the plant surface before a rain event; contact fungicides are always sensitive to rain removal, but more so before their drying on the plant surfaces.

Resistance

Fungicide resistance also is one cause of fungicide failure, but often may not be the most likely reason. The only way to be certain if there are fungicide-resistant pathogens in the field is to have the pathogens tested in a qualified lab. A more complete discussion of fungicide resistance is on page 12.



Ground applicator.

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