

SPRAYER + SPRAYEE ≠ SPRAYING

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Two plus two does not equal five. The device or machine for spraying plus the person hired for spraying do not necessarily equal spraying. Spraying is to scatter or let fall in the form of a spray or more precisely is the application of a suspension or solution of pesticides.

Disease control measures are aimed at breaking the disease triangle on one of the three basic sides. First, the host is made resistant or immune; second, the environment is made less favorable for the causal organism and more favorable for the host; and third, the causal organism is killed or prevented from reaching the host and producing disease. This last area includes application of fungicides. Remember, however, that "All the fungicides on the golf course do not substitute for a poor turf management program". I don't believe that the Minnesota Golf Course Superintendents have an over reliance on fungicides, however, the following thoughts may be helpful to you.

Fungicides can be applied before the disease strikes or after the disease starts. Fungicides can be contact or systemic. Fungicide action occurs on the surface of the host "protectant" and some must enter the causal organism to be effective. The ability to enter the fungal cell is "permeation" and the ability to damage the cell after entering is called "toxicity". When the fungicide damages the host cell, it is "phytotoxic". Fungicide action may also occur in the host. These systemic materials must not be phytotoxic but fungitoxic. The study of mechanisms by which fungicides kill fungi or inhibit their growth is difficult but required before use. This was done by the manufacturer and tested in many locations. This valuable information is digested and presented for your information on the label. Read the label! You will find directions regarding rate, interval, compatibility with other chemicals and what hosts it is to be used on.

The sprayer is important in the application of any pesticides. I use and suggest five gallons of spray solution per one thousand square feet which is adequate to wet the grass blades, thatch and top layer of soil. The solution must be uniformly divided over the entire area. The solution should not be applied with high pressure as it tends to create small droplets which drift and do not penetrate. In many cases, the multi-nozzle boom with applications equally divided in two directions is the best way to apply. Remember, it is important to get uniform coverage of the grass.

Contact fungicides such as Daconil, Thiram and Maneb are applied to prevent fungi from infecting turf. They must be reapplied frequently to protect newly emerging portions of the leaf. Most contact fungicides are relatively stable to chemical changes. The contact fungicide is also called a "protective" fungicide. The protective fungicides seldom kill the fungus in the leaf tissue which means they do not stop the spread of existing infections. Contact fungicides, however, are effective against a wide range of pathogens which may attack the grass plant. Contacts do not adequately protect roots and crowns of turf because coverage is limited, and if they did enter the host as systemic materials can, they probably would be phytotoxic. The contact-protective fungicide must resist removal and/or chemical change by water and other environmental factors and still remain toxic to fungi. This is a big order which few chemicals fulfill completely.

CONTINUED ON BACK COVER

Systemic fungicides are designed to be taken up by the plant, therefore, they are not phytotoxic at recommended rates, however, overdoses may still result in plant injury. Most systemics have lower human toxicity than contacts. By nature of the systemic action, they can protect roots and crown tissue from disease and may require less frequent application. Foliar application requirements, however, may be as high as contact types. Since systemics penetrate the host tissue and stop infections are already in progress; i.e., act curatively, applications may be delayed until symptoms of foliar disease appear. Commonly used systemics, however, are not effective against *Helminthosporium*, *Pythium*, and rust causing fungi. Some diseases, especially *Helminthosporium*, may become more severe where systemics are the predominant part of the fungicide program. As expected, some fungi became resistant to systemics as they inhibit only one event in the metabolism of the fungus and a simple mutation of one gene can lead to a strain of the fungus that is resistant. The preferred use of systemics is a single curative material. Optimal efficiency with either systemics or contacts requires a uniform distribution of the fungicide.

When was the last time you checked the sprayer, calibrated it and discussed spraying with the sprayee?

NECROLOGY

It is with deep regret that we inform you of the February deaths of Pat Johnson of Bradenton, Florida and Kenneth Graves of Luck, Wisconsin. Both were Life Members and long time supporters of the M.G.C.S.A.

Minnesota Golf Course Superintendents' Association



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**HOLE
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