

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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