

WHAT TO EXPECT AND WHAT NOT TO EXPECT FROM LAWNGRASS FUNGICIDES

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There are over 150 species of fungi and 50 species of nematodes that parasitize lawn grasses. In addition, grasses are subject to infection and colonization by viruses, bacteria, and mycoplasma. All of these organisms do not affect the same grass species. Also, the ones that affect the same grass are not active during the same season nor do they occur or in the same locality. However, there is a major disease for every species of grass in every geographic region for every month of the year. Every stand of grass in the world, then, always carries some measure of disease--and the season never ends for grass diseases.

Since diseases have the potential to completely nullify all management efforts to produce and maintain a premium stand of grass, it is important that the professional lawn applicator be knowledgeable concerning the ones that could significantly lower the quality of the lawns under his care. It is also important that he have a realistic view of how well his company's method of operation can provide effective control programs for these problems.

A Thorough and Accurate Diagnosis of the Problem is Essential

In order for a disease control program to be effective, the diagnosis of the problem must be accurate. The art of diagnosis is based on a knowledge of what diseases can occur in a stand of grass at the time in question and the range of symptoms for each.

Some of the primary symptoms of certain lawn grass diseases can overlap. For example, nine of the fourteen known patch diseases of lawn grasses are capable of producing the so-called "frog-eye" pattern of circular areas of dead grass with center tufts of green, apparently healthy plants. Also, the symptom patterns of some grass diseases are subject to the prevailing weather conditions. When the air temperatures are in the high 80's for example, the leaf lesions so characteristic of *Helminthosporium* leaf spot (incited by *Drechslera sorokiniana*) give way to an overall blighting of leaf tissue. In addition, it is not uncommon for more than one major disease to be occurring at the same time in the same location. The control programs for many diseases are fairly specific. So unless the entire disease profile has been defined, it is possible for the fungicide program to be controlling one of the diseases but the lawn still be dying-out from the other problem.

This means that the person performing the diagnosis must not limit the examination of the plants to a cursory check of a few leaves. The decision as to whether or not to recommend to the client that time, effort and money be invested in a disease control program rests on the outcome of the diagnosis. Therefore, it is very important to check the total syndrome of symptoms within the stand of grass, including the condition of the leaves, crowns and roots, before coming to a final decision on the nature of the problem.

In the event that after the on-site examination has been completed, there is a degree of uncertainty concerning the exact cause of the problem at hand, additional insight should be sought. This could mean having a laboratory examination performed to determine if pathogenic microorganisms are present in the diseased plant material. Or it could involve an on-site check of the area by a turfgrass pathologist or a lawn management specialist who is familiar with the disease patterns of the grass in question. The Land Grant university in each state provides diagnostic service for lawn grass diseases, and/or advice on the availability of private diagnostic laboratories. Information on how to obtain this type of assistance can be obtained through the local agricultural extension office.

Once the diagnosis has been completed, then the control program can be designed. Effective disease control is the result of a combination of management practices that favor the development of actively growing plants, the reduction of inoculum levels, and the protection of the plants from infection and colonization by the pathogenic microorganisms by the use of pesticides. This means that before considering what pesticides must be used, there should be a thorough evaluation of the fertilization, watering, mowing height, and thatch control practices that are being followed to determine if each operation is proper for the grass in question and for the season at hand. This having been done, then the pesticide that is best suited for the program can be selected.

Procedures for Selecting the Proper Fungicide

In comparing the merits the various fungicides that are labeled for control of the disease in question, one should consider how long it takes each material to bring the disease under control, and how long one might expect the control it provides to last per application. This will not only give a comparison of product performance, but it will also provide the information needed to calculate comparable costs, for it will indicate how much total product will be required to complete the program, and define the total labor requirements needed to apply each material.

Every pesticide carries three names: a chemical name, a common or coined name, and a trade or product name. The chemical name is developed by a standard procedure. It describes the basic chemical make-up of the compound. The common name, on the other hand, is a term coined for the material in question by a special committee. It may or may not give some indication of the the chemistry of the compound, and is accepted internationally as the uniform or standard name of the pesticide. The trade or product name is a manufacturer's designation for the material. It is protected by copyright as the sole property of a specified formulator. Certain pesticides are marketed under several trade names, while other materials are sold under only one trade name.

At present, some nineteen basic fungicides have been labeled for use in lawn grass disease control. Seven of these are absorbed and move within the plant (systemic), and the remaining twelve are active only on the plant surface (non-systemic). The common names of these materials, and representative trade names and manufacturers are listed below.

I. Non-Systemic Lawngrass Fungicides:

| <u>Common Name</u> | <u>Trade Names</u> ¹ |
|--------------------|--|
| Anilizine | Dyrene (Mobay Corp.) |
| Chloroneb | Terraneb SP (Gillmore Chem. Co.) |
| Chlorothalonil | Daconil 2787 (SDS Biotech) |
| Cycloheximide | Acti-dione (Tuco) |
| Ethazole | Koban (Mallinckrodt) |
| Mancozeb | Fore (Rohm & Haas) |
| Maneb | Tersan LSR (DuPont) |
| Quintozene (PCNB) | Turficide (Olin Corp.) Scotts FF II (O.M. Scotts) |
| Thiram | Tersan 75 (DuPont) |
| Vinclozolin | Vorlan (Mallinckrodt) |
| Zineb | Dithane Z-78 (Rohm & Haas) |

II. Systemic Lawngrass Fungicides:

| <u>Common Name</u> | <u>Trade Names</u> ¹ |
|--------------------|---------------------------------|
| Benomyl | Tersan 1991 (DuPont) |
| Fenarimol | Rubigan (Elanco) |
| Triadimeron | Bayleton (Mobay Corp.) |
| Thiophanate Ethyl | Cleary 3336 (Cleary Corp.) |
| Thiophanate Methyl | Fungo 50 (Mallinckrodt) |
| Metalaxyl | Subdue (Ciba-Geigy) |
| Propamocarb | Banol (Tuco) |

It is important that the professional lawn applicator have a working knowledge of this list. To begin with, he should be able to recite from memory the common name and at least one trade name for each of the basic fungicides. Also, each lawn care company that provides a disease control program should have its own resource file for ready reference in the selection and use of lawn grass fungicides. It should contain up to date labels for each fungicide as well as a separate typewritten page for each label that lists the product's use restrictions and possible side effects. This statement should be reviewed by the members of the spray crew just prior to each use of the material.

The fungicide resource file should also contain copies of the most recent lawn grass disease control guide published by the Land Grant university of the state in which the operations are being performed. In addition, it should have notations taken by the company's staff from papers given at lawn grass management conferences and article from trade journals on the relative merits of the various fungicides and the most effective procedures for using them.

¹ This is a list of representative manufacturers and trade names. It is for the purpose of illustration, and therefore, does not in itself imply an endorsement or recommendation by the author over any other trade name of the same fungicide.

Factors to Consider in Selecting the Type of Fungicide Formulation

Several of the basic turfgrass fungicides are marketed as both granular and spray formulations. Granular fungicides have the advantage of being able to be applied with equipment that is both lighter and less expensive than that needed for spray formulations. Also, granulars are more convenient for use in "spot treatment" of small areas of within a lawn.

In a six year field research program at Virginia Tech, we compared the relative effectiveness of granular and spray formulations of the same basic fungicides in the control of spring and summer diseases of grasses. These studies showed that:

1. Granular formulations of non-systemic fungicides require 2-3 times the active ingredient level of spray formulations to produce the same degree of disease control.
2. Granular formulations of non-systemic fungicides require a longer time to bring the target diseases under control, and they hold their established levels of control for a shorter period of time than the same active ingredients as spray formulations.
3. When applied at the same active ingredient dosage levels, the granular formulation of the systemic fungicide Bayleton provides the same level of control of Sclerotinia dollar spot as the spray formulation.
4. There can be a significant difference in effectiveness of disease control among the various granular fungicide product lines of the same active ingredient.
5. Application of granular fungicides to wet leaves improves their disease control effectiveness.
6. Mowing immediately after the application of a granular fungicide can reduce its effectiveness in disease control.