

Fungicide Tips From Dr. Couch

by MARK JARRELL

IN May, those in attendance at the joint meeting of the Palm Beach and South Florida Superintendent Associations were given a special treat in the form of a presentation by the leading turfgrass pathologist in the world, Dr. Houston B. Couch.

Dr. Couch, Professor of Plant Pathology at Virginia Tech and author of "Diseases of Turfgrasses", shared vital information concerning the proper use of fungicides. His dynamic and fact-filled presentation left many of us feeling a little ignorant, and disappointed that more time hadn't been available for his talk.

His admirable efforts to cover so much ground in so little time caused some confusion of facts with us slower-witted types, so I wrote to Dr. Couch requesting a synopsis of the information he had tried to convey. He responded quickly and generously with a copy of the complete report and permission to use it as we saw fit.

What follows is the most useful information for Superintendents from Dr. Couch's field research program which was initiated at Virginia Tech in 1977.

I. Granular vs. Spray Formulations

- 1.) Granular formulations of non-systemic fungicides require 2 to 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 than the same active ingredients as spray formulations.

- 3.) There can be a significant difference in efficiency of disease control among various granular fungicide product lines of the same active ingredient.
- 4.) Application of granular fungicides to wet leaves improves their disease control effectiveness.
- 5.) Watering immediately after the application of granular fungicides reduces their effectiveness in disease control. The extent of this reduction can vary among the various product lines.
- 6.) Mowing and collecting clippings immediately after the application of granular fungicides reduces their effectiveness in disease control. The extent of this reduction can vary extensively among the various product lines.

II. Optimum Dilution Rates and Flat Fan Nozzle Tip Size

- 1.) With each of 6 fungicides tested, optimum disease control was consistently achieved with the T-8002 tip.
- 2.) The optimum dilution levels for maximum disease control for the tested fungicides were as follows:

Fungicide	Dilution/1,000 sq. ft.
Daconil 2787	1 gallon
Dyrene	1-2 gallons
Bayleton	2 gallons
Chipco 26019	0.5-4 gallons
Banner	2 gallons
Vorlan	1-2 gallons

III. Optimum Nozzle Types and Nozzle Pressure

- 1.) For greens spraying, Dr. Couch's "pick of the litter" is flat fan T-8002 or T-8004 tips at 30-60 psi at the nozzle.
- 2.) With the exception of Dyrene, the Raindrop RA-10 and RA-15 swirl chamber nozzles at 30 psi nozzle pressure work just as well as the flat fan nozzles. Dr. Couch feels the ideal setup is fair-way spraying with the Raindrop nozzles (there are fewer skips from a bouncing boom and their delivery rate is much higher) and then changing to flat fans for the greens.
- 3.) It is critical to space the Raindrop nozzles on the boom to provide for a 100% overlap (whereas with the flat fan, a 30-60% overlap is adequate).

- 1.) Do not use flood jet nozzles for application of fungicides.

IV. Effect of Post-Spray Rainfall or Irrigation on Fungicide Effectiveness

- 1.) If leaf washing from rainfall or irrigation occurs before the spray dries on the leaves, non-systemic fungicides are rendered completely ineffective in disease control. However, once these sprays have



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dried on the leaves, the leaf washing will not alter their disease control effectiveness.

- 2.) Systemic fungicides are not as vulnerable as the non-systemics to reduction in disease control effectiveness by rainfall or irrigation before the spray dries on the leaves. However, there can be a significant difference among systemic fungicides with respect to the degree of reduction in disease control efficiency brought on by leaf washing before the spray dries. For example, control of dollar spot by Rubigan was reduced 50% by leaf washing, but the effectiveness of Bayleton was not reduced.
- 3.) If the fungicide formulation contains an effective sticking agent, either rainfall or irrigation immediately after the spray dries on the leaves will not appreciably reduce the material's initial disease control effectiveness.
- 4.) The basic effectiveness of a turfgrass fungicide is established by the initial amount of water used in the spray formulation. Once the material has dried on the

leaves, it can not be dislodged or redistributed on the plant by sprinkler irrigation or rainfall.

V. Effect of pH of the Mixture and In-Tank Storage Time on the Stability of Turfgrass Fungicides

The pH of the spray solution can have a significant effect on the performance of certain pesticides. In the alkaline range, some fungicides undergo hydrolysis, which is an irreversible chemical reaction in which the hydroxyl ions in the water interact with the pesticide in such a manner as to break it down into a different compound.

In instances where a fungicide itself is stable under alkaline conditions, there is still the possibility of the makeup of the formulation itself becoming altered. Among the fungicides used on turf, Actidione, Dyrene, and Daconil 2787 will hydrolyze to varying degrees if the spray is alkaline.

- 1.) The initial preparations of Chipco 26019, Vorlan, Banner, and Bayleton are tank stable in the pH 3.5 - pH 9.5 range. Also, storage for a period of 24 hours at these pH levels apparently does not alter the disease control effectiveness.

- 2.) If Daconil 2787 is allowed to stand for 20 hours before being used regardless of the pH of the solution, it will lose a significant amount of its fungicidal properties.

- 3.) Dyrene is alkaline sensitive. It should be prepared in a solution between pH 3.5 and 6.5 and used immediately. If it stays in the tank for 20 hours before use, a major reduction in disease control effectiveness occurs at both acid and alkaline pH levels.

- 4.) If Rubigan is used at the time it is prepared, pH does not affect its disease control effectiveness. It will retain its effectiveness for 24 hours at pH ranges from 6.5 to 9.5, but will lose a significant amount of disease control potential if allowed to stand 24 hours at pH 3.5

Dr. Couch's final advice for us in Florida was to do our best to keep Monica Juncke, our turfgrass pathologist in Ft. Lauderdale, busy and happy. She joins a select group of only 5 fulltime pathologists working strictly on turfgrass problems on the North American continent. ■



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