

WHY WE VALUE CHLOROTHALONIL



Posted by Richard Latin on 22 Mar 2016 / 0 Comment

This year marks the 50th anniversary of the registration of chlorothalonil (the original Daconil) for US turf markets! It is defined as a broad spectrum, contact fungicide with a multisite mode of action. So what does all that mean? Broad-spectrum means it is potent against many types of pathogenic fungi. Contact fungicides remain on plant surfaces and do not affecting existing infections. **Multisite means that the chlorothalonil molecule disturbs many metabolic sites in fungal cells.** There are numerous broad-spectrum fungicides, and other contact fungicides, but very few truly effective multisite compounds. Chlorothalonil's multisite nature makes it such a valuable part of our chemical toolbox. Do you understand why?

In order for a pathogen strain to over-come the effects of the fungicide toxin, there must be a mutation that detoxifies the fungicide while allowing all other life functions to proceed normally. If a compound disturbs only one metabolic site (site-specific) in the fungus, the likelihood of the "detoxifying" mutation arising in a population is very good. However, **if the fungicide inhibitor is multisite, the chance appearance of that all-inclusive mutant strain will be zero, or as close to zero as possible in biological systems.** Recall

that within a few years of introducing site-specific fungicides such as benomyl (Tersan 1991), triadimefon (Bayleton) and iprodione (Chipco 26019), resistant strains of *Sclerotinia homoeocarpa* became predominant on some golf courses. Not so with Daconil. It has withstood the test of time, thanks to its multisite inhibitor.

There is another reason chlorothalonil is so valuable, especially as a tank mix with site-specific (SS) compounds! All disease issues are population issues. **The mutation that renders SS fungicides ineffective has a much greater chance of arising in large populations.** It's like the lottery. Buy a lot of tickets you increase your chance of having a winner (think fungicide-resistant mutant). Buy only one or two tickets, the likelihood that you will win is very low. So, if you can keep *S. homoeocarpa* populations low with multisite compounds, the chance occurrence of mutants that detoxify SS compounds will be much lower as well. This practice will extend the life of at-risk SS fungicides.

That's why I always recommend tank-mixing chlorothalonil with SS fungicides, especially for controlling anthracnose and dollar spot. Whether you use the brand name Daconil, or a post-patent product, the chlorothalonil will be a valuable tool for improving disease control and reducing the resistance vulnerability of our more modern fungicides. Here's to another 50 years!



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Dr. Rick Latin is a professor of plant pathology at Purdue University and has been a member of the faculty since 1981. He earned his MS and Ph.D. degrees in plant pathology at Penn State University. Rick has research, teaching, and extension responsibilities in the area of turfgrass disease management and recently authored the best selling textbook-- A Practical Guide to Turfgrass Fungicides. His current research activities focus on turf fungicides and factors that influence their performance.

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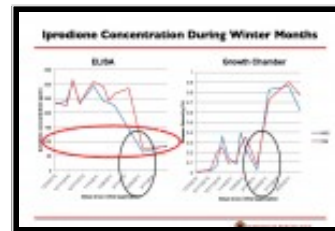


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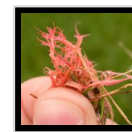
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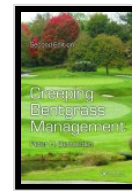
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