

# Fungicide and Nematicide Update

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## New Fungicides for Cereal Disease Management

Several new fungicides are being tested for use in cereal disease management. Triadimefon (Bayleton), a systemic sterol inhibitor providing wide-spectrum protective and curative activity primarily against powdery mildews and rusts, was recently registered on wheat and barley for powdery mildew and leaf, stem, and stripe rusts. Another new sterol inhibitor tested extensively on wheat was propiconazol (Tilt), a broad-spectrum fungicide with activity against certain ascomycetes, basidiomycetes, and deuteromycetes but little or no activity against phycomycetes. The experimental triazole RH-5781F, evaluated in many of the same trials as triadimefon and propiconazol, is also a sterol inhibitor. This broad-spectrum, ambimobile systemic fungicide has protective and curative activity similar to that of propiconazol.

In the southeastern states, triadimefon, propiconazol, and RH-5781F generally provided good to adequate protection against infection by the leaf rust, powdery mildew, and *Septoria* fungi. In two studies in Arkansas, triadimefon gave the best control of leaf rust, leaf blotch, and glume blotch but was not as effective as propiconazol against scab or powdery mildew. A mancozeb-triadimefon tank mix showed better broad-spectrum activity than a mancozeb-benomyl mix for controlling scab, leaf rust, *Septoria* leaf blotch, and powdery mildew. In Mississippi, mancozeb alone or tank-mixed with triadimefon or benomyl effectively controlled leaf rust, *Septoria* leaf and glume blotches, and powdery mildew. In Tennessee, tank mixes of mancozeb with benomyl or with RH-5781F were the most effective treatments against *Puccinia recondita* f. sp. *tritici*. Another tank mix that effectively controlled leaf rust, powdery mildew, and *Septoria* glume blotch was mancozeb with anilazine (Dyrene).

Other fungicides tested on wheat in the Southeast were chlorothalonil (Bravo 500), butrizol (Indar), and thiophanate-methyl (Topsin-M). Butrizol is specific for *P. recondita* f. sp. *tritici* and shows no activity against other wheat pathogens. Chlorothalonil gave some control of leaf rust, *Septoria* leaf and glume blotches, powdery mildew, and scab, but its performance varied from test to test and in general it was not as effective as triadimefon or propiconazol. In experiments in Mississippi and Tennessee, thiophanate-methyl did not control leaf rust or *Septoria* leaf and glume blotches, but in Tennessee it provided good control

of powdery mildew and fair control of *Septoria* glume blotch.

The three new sterol-inhibiting fungicides tested in the Southeast appear to be equally effective at controlling leaf rust and powdery mildew, but propiconazol seems to have better activity against *Septoria* sp. causing leaf and glume blotches. Timing of the application may be a factor. A Tennessee study showed that propiconazol gave better control of glume blotch, leaf rust, and powdery mildew when applied to wheat at growth stage 8 and again at stage 10.1 (Feekes Large Scale) than when applied only at stage 8. The same study showed that RH-5781F with a spreader sticker also was highly effective against these foliar diseases when applied at boot stage and again in 10 days.

Cereal grain fungicide reports from South Carolina, North Carolina, and Virginia were limited to control of powdery mildew. In each of these states, triadimefon protected flag leaves from infection by *Erysiphe graminis* f. sp. *tritici*. Plots treated with benomyl or RH-5781F also showed significantly less powdery mildew than an untreated plot in a North Carolina test, but control was not correlated with higher yields. Plots treated with a triadimefon-mancozeb tank mix or triadimefon alone significantly outyielded untreated plots in one Virginia test. In another, two applications of propiconazol or triadimefon held powdery mildew severity to zero, although overall mildew severity was light and apparently had no effect on plot yields.

In the northern and central Great Plains, researchers tested several registered and experimental fungicides against a variety of foliar pathogens. In the Dakotas, effectiveness of propiconazol in controlling tan spot on spring wheats varied. In North Dakota, control of tan spot, leaf rust, and *Septoria* leaf blotch and residual activity against the two leaf-spotting fungi were better with propiconazol than with mancozeb. Researchers in South Dakota, however, found a tank mix of mancozeb and RH-5781F to be the most effective treatment for tan spot. RH-5781F, mancozeb, triadimefon, and fenpropimorph (Corbel) gave fair to poor control and chlorothalonil and benomyl were not effective in protecting plants from infection by *Pyrenophora trichostoma*. None of the treatments in the South Dakota test controlled scab under epidemic conditions.

Studies in Missouri and Nebraska were conducted under intense foliar disease pressure. Triadimefon and propiconazol generally provided good control of leaf

rust, but in Nebraska, both treatments gave marginal control of *Septoria* leaf blotch. In Missouri, a tank mix of benomyl-chlorothalonil or benomyl-propiconazol provided some control of scab. In Nebraska, a tank mix of RH-5781F and mancozeb gave the best protection against *P. recondita* f. sp. *tritici* and *S. tritici*. This treatment was not as effective in Missouri, however.

Researchers in Ohio, Indiana, and Kentucky reported triadimefon and propiconazol to be effective against *P. recondita* f. sp. *tritici*, *S. tritici*, *S. nodorum*, and *E. graminis* f. sp. *tritici*. Researchers in Ohio reported that seed treatment with carboxin (Vitavax) alone or tank-mixed with etaconazole (Vanguard) or triadimefon had no significant effect on severity of either powdery mildew or leaf rust. In Kentucky, plots treated with a tank mix of triadimefon and thiophanate-methyl had the highest yield and the lowest leaf rust rating. In another test, three applications of mancozeb gave better control of leaf rust than of powdery mildew or *Septoria* leaf blotch.

In Pennsylvania, triadimefon suppressed powdery mildew and partially controlled *Septoria* leaf and glume blotches. Adding anilazine, chlorothalonil, benomyl, or mancozeb to triadimefon in a tank mix improved activity against *Septoria* leaf and glume blotches. A tank mix of RH-5781F and mancozeb gave better control of leaf rust and *Septoria* leaf and glume blotches than either used alone. Pennsylvania researchers also reported that propiconazol controlled leaf rust, powdery mildew, and *Septoria* leaf and glume blotches and that two applications were more effective than one.

In Washington and Oregon, two applications of triadimefon or propiconazol gave good control of stripe rust. Chlorothalonil showed activity against *Puccinia striiformis* in Oregon, but neither it nor fenpropimorph was effective in Washington.

In Texas, triphenyltin hydroxide (Super Tin) controlled *Rhizoctonia* sheath blight of rice. Propiconazol also controlled *Rhizoctonia* sheath blight and was the only treatment effective against brown leaf spot.

*Dr. Watkins is editor of the cereal and forage crops section of Fungicide and Nematicide Tests, William C. Nesmith, Editor, published annually by the New Fungicide and Nematicide Data Committee of The American Phytopathological Society. Copies of current and past volumes may be obtained from Richard E. Stuckey, Business Manager F & N Tests, Plant Pathology Department, University of Kentucky, Lexington 40546.*