

OVERVIEW OF 2002 SMALL GRAIN FUNGICIDE TRIALS

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The Carrington Center continues a long-term effort of evaluating foliar fungicides for management of small grain leaf and head diseases, primarily with wheat. In 2002, six fungicide trials were conducted in HRS (hard red spring) wheat, durum, and barley. The following is an overview of selected trials including objectives, materials and methods, and preliminary results.

HRS wheat variety response to foliar fungicides.

The trial objective was to evaluate the response of 'Alsen' (leaf rust=R, foliar disease=S, scab=MR), 'Reeder' (leaf rust=R, foliar disease=MR scab=M) and 'Walworth' (leaf rust=MS, foliar disease=S, scab=S) HRS wheat to foliar fungicides effective to assist growers with making fungicide application decisions partially based on variety tolerance to disease. The irrigated trial was seeded on 2001 soybean ground (with supplemental wheat straw) at 1.5 million pure live seeds/acre on May 21. Fungicide treatments included: untreated check, Folicur at 4 fl oz/A, and AMS 21619 (experimental) at 5.7 fl oz/A + NIS (Induce) at 0.125% v/v. Fungicide treatments were applied to wheat in the early-bloom stage (Feekes 10.51) with a hand-boom plot sprayer equipped with 80015 twin jet nozzles delivering 17 gpa at 40 psi.

Fungicide treatments across the three varieties improved seed yield (5.4 to 6.3 bu/A), test weight (0.9 to 1.3 lb/bu), seed weight, and protein and decreased DON (0.6 to 1.1 % points) compared to the untreated check. The primary factor for wheat response to fungicides likely was due to reduction of fungal leaf spot disease (leaf rust and tan spot).

Field measurements of scab, yield, seed weight, and protein did not differ when evaluating the variety by fungicide interactions. 'Reeder' and 'Walworth' test weight improved 1.5-1.6 lb/bu with AMS 21619 while 'Alsen' test weight improved 1.7 lb/bu with Folicur compared to the untreated checks. DON was reduced to 0.5-0.6 ppm with fungicide application compared to the untreated check (1.6-2.4 ppm) with 'Reeder' and 'Walworth'. Although DON levels did not differ among fungicide treatments with 'Alsen' (0.5-0.9 ppm), the DON levels were low and similar to levels of the other varieties treated with fungicides.

Suppression of fusarium head blight (scab) with fungicides in HRS wheat and durum.

A uniform set of 15 treatments was established to evaluate the efficacy for scab control with fungicides in 'Russ' spring wheat and 'Munich' durum. Each trial was planted on May 3 at 1.6 million pure live seeds/acre on ground cropped with soybean the previous year. The trial was inoculated with wheat straw and disease was fostered with limited overhead irrigation. The primary set of fungicide treatments was applied to wheat in the early-bloom stage (Feekes 10.51) with a hand-boom plot sprayer equipped with 80015 twin jet nozzles delivering 17 gpa at 35 psi.

Spring wheat trial: Treatments had a minimal effect on the incidence of scab and plot severity which averaged 57 percent and 19% percent, respectively. Grain yields averaged 49 bu/ac, with the lowest yield associated with the untreated check (39.5) and an experimental biological fungicide (37.3). The highest yield response was among selected treatments of AMS 21619, Folicur, and BAS 505 that resulted in yields of over 53 bu/acre. Numerous treatments resulted in significant yield responses that ranged from 10 to 15 bu/acre. These yield responses were due to the treatments impact on suppressing scab along with significant control of leaf spot diseases, especially leaf rust. Presence of DON in the grain was not significantly impacted by fungicide treatment in this trial. Grain protein contents were not impacted by treatments, however test weights and seed weights were improved with selected fungicides.

Durum trial: Treatments did not impact the incidence of scab and plot severity in this trial which averaged 91 percent and 41 percent, respectively. Grain yields averaged 49 bu/ac, with the lowest yield associated with the untreated check and an experimental biological fungicide (41 bu/ac). The highest yield responses were again among selected treatments of AMS 21619, Folicur, and BAS 505 that resulted in yields of over 52 bu/acre. Numerous treatments resulted in significant yield responses that ranged from 6 to 15 bu/acre. Test weight and especially seed weights were positively influenced by fungicide treatments. Every fungicide treatment was effective in reducing the presence of leaf spot diseases as compared to the untreated check. The presence of DON in the durum seed samples was significantly impacted by many of the fungicide treatments. An example of this impact is the reduction of DON from 3.3 ppm in the untreated check to less than 1.0 ppm in selected treatments of AMS 21619.

Additional studies.

Scab management in barley: A new research effort was initiated to refine fungicide based strategies to manage fusarium head blight (scab) in barley. The emphasis of this research is to suppress the impact of scab, especially DON levels in the grain through a combined strategy of improved fungicides, high plant populations and modified application timings. This effort is a collaboration with scientists at the Langdon REC and Terry Gregoire, an NDSU Extension Agronomist. This preliminary research will continue in 2003.

Company collaborations.

Scab and leaf disease control: Two additional field studies were conducted to evaluate experimental fungicides and commercial checks for the management of cereal diseases. One trial was focused on fusarium head blight and the leaf disease complex. An additional trial was designed to evaluate fungicides for the control of leaf rust in spring wheat.