Progress Report to NC Small Grain Growers Association, 2022-23
Improving Small-Grain Disease Management in North Carolina -- C. Cowger, USDA-ARS

Christina Cowger, USDA-ARS Research Plant Pathologist, appreciates the funds provided to our program for small-grain disease research and education to benefit the North Carolina small-grain industry in 2021-22. Funds were used as follows:

(1) <u>Supported the North Carolina Small Grain Industry</u>

Our program supported the industry with education, diagnostics, and decision support. This past year, we provided:

- **Research-based advice** to county agents, agronomists, crop consultants and growers
  - Sent out 4 timely updates on scab risk, which remained low virtually statewide, by email and text via national website (Feb. 3, Feb. 11, Feb. 18, and Feb. 25)
    - A retired county extension director consulted with me on behalf of a producer weighing whether to spray a very large field of susceptible Shirley wheat for scab. On the basis of my assessment, the grower elected to save himself the $8,000+ fungicide bill. Later on, the grower was pleased: there were no visible symptoms of scab, and he was considering an entry in the wheat yield contest.
  - Provided diagnosis and decision support by phone, email and in person to ~20 county agents, NCDA specialists, and private crop consultants regarding biotic and abiotic problems, fungicide & other management decisions for specific farms and fields across the state
- **Talks and interviews** on profitable small-grain disease management and fungicide decision-making
  - Spoke at Union County Field Day (Feb. 7, ~70 people)
  - Spoke at NE Ag Expo (Feb. 15, ~150 people)
  - Spoke at Central Piedmont Field Day (Mar. 1, ~100 people)
- **Diagnosis and recommendations** to clients of the NCSU Plant Disease & Insect Clinic (PDIC).
  - Diagnosed 37 wheat, barley, oat and triticale samples submitted to PDIC; provided management recommendations
- **Article in Wheat Beat** on "Fungicide Decisions" (Mar. 17)

(2) **<u>Screened advanced wheat and barley breeding materials for resistance to Fusarium head blight (FHB) and Septoria nodorum blotch (SNB).</u>**

- Provided wheat and barley breeders with FHB severity data and DON ratings for advanced experimental wheat and barley lines in our misted, inoculated nursery in Raleigh.
- Provided breeders with SNB resistance ratings for 328 advanced experimental lines from wheat breeding programs in NC, VA, SC, GA, and surrounding states. These are often breeders' only SNB data, and allow them to choose lines for release that have good levels of resistance to leaf and glume blotch.

(3) **<u>Coordinated a multi-year field experiment on barley yellow dwarf virus</u>**, comparing wheat genetic resistance to insecticide application in fall or spring (working with Drs. Murphy, Reisig and Anders-Huseth).

- Experiment uses 2 NCSU experimental lines containing the highly effective *Bdv2/3* resistance gene and SS8641 as susceptible control.
- So far, results indicate genetic resistance of the two lines with *Bdv2/3* protects yield as well as a February insecticide application on the susceptible line, saving money.

(4) **<u>Publicized results of 4-year field experiment on FHB management</u>**, comparing Miravis Ace to Prosaro and Caramba at early, normal and late timings. Results show that all products are most effective against FHB and the mycotoxin DON when applied at or shortly after flowering (wheat) or at 6 days after full heading (barley), and not at 50% head emergence as is claimed by a manufacturer. USDA-ARS did a news release (May 15).