

**ANNUAL PROGRESS REPORT
TO
NORTH CAROLINA SMALL GRAIN GROWERS ASSOCIATION, INC.**

TITLE: Small Grains Problem Diagnosis Support for Cooperative Extension Agents

LEADER(S): Matthew Bertone¹, Luke Gatiboni² and Kristin Hicks³

DEPARTMENT(S): Entomology and Plant Pathology¹, Crop & Soil Sciences² and NCDA&CS Agronomic Services³

REPORT:

Our approach to strengthening crop problem diagnosis efforts is to request funding from each of several commodity groups to fund analysis of samples submitted by cooperative extension agents. This project funded analysis of soil and plant tissue samples at the NCDA&CS Agronomic Division Laboratory and plant and soil samples at the NCSU Plant Insect & Disease Clinic that were collected from problem wheat fields. This is not intended to cover all analytical needs, but for program support to allow agents to diagnose specific problems important to their region of the state. Rather than distributing voucher quotas, funds are managed through a spreadsheet tallying cumulative samples & remaining funds for each commodity involved. Fund availability is advertised to NC Cooperative Extension agents.

As examples of the type of extension program support provided, during fiscal years 2010/11 through 2018/19 a total of 209 small grain problem plant tissue samples were analyzed. During the 2019/20 small grains crop season, 41 plant tissue samples were analyzed. During the 2020/2021 season 127 diagnostic samples were analyzed. Finally, in 2021/22, 236 small grain samples were analyzed in the extension diagnostic program. It shows how this program is important and its utilization as a tool has increased over the years.

Forty-six (46) samples of small grains (wheat, oats, barley, sorghum, etc.) were submitted to the NC State Plant Disease and Insect Clinic during the reporting period, as follows: 41 wheat/triticale, 2 sorghum, 2 oats, and 1 barley. Of these, 21 qualified for commodity support through this project. The following were the most commonly found pathogens, pests, or other disorders in all host plants (all 2022 and current 2023 data): 59 abiotic issues (including freeze/cold damage, high pH, low pH, and nutritional imbalances), 10 unknown disorders, 10 take-all (*Gaeumannomyces* sp./spp.), 4 rusts (including wheat leaf rust, *Puccinia triticina*, and stripe/yellow rust, *Puccinia striiformis*), 2 bacterial blight (*Xanthomonas* sp./spp.), 2 *Penicillium* ear rot (*Penicillium* sp./spp.), 2 sugarcane aphids (*Melanaphis sacchari*).

The NCDA&CS Agronomic Division plant tissue lab maintains summary statistics on all wheat samples analyzed. When pooled with funds provided by other commodity groups (corn, cotton, soybean, tobacco), samples from most of the counties with some agricultural activity have been analyzed.

In addition to the practical objective of helping farmer to identify nutritional issues for small grain crops, this project also represents a personnel training resource for a substantial portion of the agricultural extension agents of the state. Program results are also used in support of other training events related to crop nutritional problem diagnosis. These events include professional agronomist training events and winter meetings with farmers, extension personnel and stakeholders.

IMPACT:

This program resulted in more qualified agricultural agents, and in farmers that better understand their production constraints. Once the value of these diagnostic efforts is better understood, we expect producers will be more willing to pay the standard diagnostic fees themselves. This project will also allow us to monitor problem diagnosis and more formally document the potential crop losses or economic benefits if managed per recommendations.

Budget / Financial Status Update (through June 30, 2023):

Personnel – \$ 0.00

Materials and Supplies – \$ 480.00

Travel – \$200.00 (Gatiboni unable to travel during scheduled time in 2022 due to hurricane)

Other costs (analysis) – \$900.00 (NCDA analyses not billed yet)