Minnesota Small Grain Pest Survey Scouting
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Research Questions

The objective of this project was to allow for timely small grain pest identification across the state of MN, resulting in early producer notification through Extension media in combination with NDSU’s already established pest survey program. This need was identified with the two year absence of a state small grain plant pathologist and MDAs decision to discontinue their statewide crop pest survey.

Results

Statewide sampling began the first week of June and continued throughout the small grain growing and ended on August 11th. During that time, the Minnesota scouts surveyed for insect pests, including wheat stem maggot and multiple cereal grain aphids species. Aphids were found across the sampling region and were at threshold levels in some isolated areas. Small grain viruses (i.e., barley yellow dwarf, wheat streak mosaic virus) and bacterial leaf stripe were also common from the report data. Common fungal pathogens found included leaf rust, loose smut, septoria, fusarium head blight and tan spot. Season final data is illustrated in Appendix 12 and 13. These maps provide a regional representation of what was detected, where and when. Reports were released weekly.

This approach allowed for the first detection of many pests and was combined with location and plant stage. Incidence and severity were reported for each pest. Many other factors such as lodging, hail, planting dates, and pesticide applications were recorded to support the data.

Application/Use

This pest survey was developed and implemented for the early and correct identification of small grain insect and pathology pests across the state of Minnesota and to combine and report those findings with the ongoing project at North Dakota State University. The idea was to create a regional approach to surveying and reporting pest data to producers, researcher, consultants, and agricultural industry. The outcomes included early identification of tan spot across the entire sampling area allowing for quick management decisions. Small grain aphids were also found quickly and reported as to allow for timely notifications and treatments.

The data collected was reported weekly in print with the NDSU Pest Survey Report but was also disseminated to other researchers. The overall findings were represented to consultants and seed industry personnel, as well as discussed at summer plot tours. Sites included Kilkenny, Mora, Benson, Fergus Falls, Perley, Strathcona, Hallock and the Northwest Research and Outreach field day.

This detection and reporting system notified producers of the presence or absence of pests and the incidence and severity of the problem. With that data, producers could make educated, timely, and effective decisions leading to an economically feasible integrated pest management approach. The data collected represented pests found, but equally important was the time they were identified, as well as those not found.

Materials and Methods

Two pest scouts were hired to collect the needed data. Scout 1 (Coreen Berdahl) worked under the supervision of Jochum Wiersma with a home base of Crookston, representing production areas of Northwestern Minnesota. Scout 2 (Derrick Nelson) worked under the supervision of Doug Holen out of Fergus Falls with geographic responsibilities of west central, central, and southern Minnesota. This project had oversight from faculty of the U of MN St. Paul campus as well as training for job responsibilities and data reporting with NDSU. Three travel courses were mapped from each home base and traveled weekly to assure maximum geographic representation. Random fields were found and sampled with data collection taking place on site with the use of notebook computer systems. Samples were collected for verification if questions persisted with findings. All data components were downloaded and forwarded to Phil Glogoza who formatted the data set and then passed it through to NDSU for reporting in their system. Generated data sets were then also forwarded to supervisors. Supervisors were in constant communications with the scouts allowing for current knowledge on findings. About 40 fields per week were sampled.
between the two scouts. Some fields were revisits if a pest population warranted monitoring, otherwise new sites were sought.

**Economic Benefit to a Typical 500 Acre Wheat Enterprise**

The economic benefit was the timing and correct identification of small grain pests. With that information, producers knew what pest was present, when it was detected, at what levels, and plant growth stage it was found. Decisions could then be made as to whether or not treatment was necessary, and which products and rates were needed if thresholds were found. Equally important were decisions that pesticide applications were not economically justified due to pest populations and/or plant growth stage. As history has shown, millions of dollars have been lost due to pests such as leaf rust and fusarium head blight, as well as millions spent on pesticides in hope of controlling these and many other small grain pests. An average producer will apply fungicide one to two times per season and insecticide if needed. These efforts allowed for the timely notification of pest populations and allowing for the proper expenditure of money for pest management when and where needed.

**Recommended Future Research**

It is our belief that this surveying effort should continue and can be improved upon with quicker data turnaround time to the agricultural community.

The benefits of this program include: identify the presence of regional pests in a timely fashion, save countless hours of small grain researchers time and resources in travel and communications, improve knowledge of localized pest conditions, increase visibility and perception of overall effort in small grains, establish a cooperative effort with NDSU, generate data for use by local coops, consultants, researchers, and producers.

Suggestions to improve the surveying system: Daily log of data collected and dissemination; cooperate with NDSU for training and reporting; better equip the scouts to make the best use of their time; use rental vehicles; develop cards with information on where to access the data that the scouts can hand out to clientele when approached; and, better planning of travel paths for more direct routes to the most possible fields.

It is this researcher’s objective to submit a very similar proposal with the mentioned improvements. This was a very valuable pilot year.

**Related Research Effort**

At this time there is no related effort in Minnesota. The Minnesota Department of Agriculture had previously performed something similar across the state and for all crops. That program no longer exists. The absence of an outstate plant pathologist within the U of MN Extension system also highlighted the need for such a project. For two seasons, the project supervisors have responded to statewide pathology questions and programming. This approach saved many faculty hours by reducing the need for travel to investigate client reports while establishing and process for timely collection and representation of area- wide survey data.

NDSU has had the pest survey system in place for many years and our goal from the beginning planning stages was to incorporate our data into their program for a stronger and regionally larger report.