

## Summary of Wheat Diagnostics in 2013

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In the spring of 2013 the Michigan Wheat Board agreed to financially support diagnostic testing for Michigan's wheat growers. The intent was to increase the knowledge base of the pests and pathogens that are currently creating production challenges for the industry.

During the 2013 wheat growing season, twenty-six samples, from eleven counties, were submitted to the lab for diagnostic evaluation. These samples were submitted by MSU Extension Educators, agribusiness professionals, and growers. Submitters were encouraged to submit samples of wheat that were taken from "good" and "bad" areas of the field (Figure 1). This allows for a direct comparison and is extremely helpful in the diagnostic evaluation.

Each sample was examined for signs of disease, nematodes, and abiotic issues. Many of the samples were also analyzed with ELISA tests for eleven viral pathogens and one bacterial pathogen of wheat (this testing was done by an outside laboratory).



**Figure 2. Wheat stunted by excessively low soil pH. Photo credit: Jackie Smith, Michigan State University**

Eight of the twenty-six samples submitted had symptoms that were attributed to nutritional deficiencies and/or high or low soil pH levels (Figure

2). Plant parasitic nematodes were detected in several of the samples; however based on the numbers recovered they were not the primary cause of the symptoms on the wheat samples.

Two different viruses were detected during the 2013 growing season. Barley yellow dwarf virus was confirmed in three samples from Sanilac and Ingham Counties. Wheat streak mosaic virus was confirmed in one sample from Ingham County. Overall, the incidence of viral pathogens was lower than expected, based on wheat virus surveys done in other wheat producing regions of the U.S. (Burrows et. al, 2009).



**Figure 1. Example of a sample submitted with entire plants taken from bad (shown on the left) and good (shown on the right) areas of a field.**

Bacterial mosaic (*Clavibacter michiganensis* subsp. *tessellarius*) was confirmed in four samples; these samples were from Presque Isle and Sanilac counties.



Figure 3. The mosaic-like pattern of tannish-yellow flecking is typical of symptoms caused by bacterial mosaic. Spindle-like chlorotic lesions are caused by WSSMV. Photo credit: Gail Ruhl, Purdue University.

Symptoms of this disease are present on the foliage, and mimic the mosaic and flecking caused by some viral diseases (Figure 3). Although the disease is reported to occur annually on a nationwide basis its impact on wheat production is not well defined. During the 2014 growing season we will continue to test for the pathogen that causes this disease. Additional monitoring throughout the season will help increase our awareness and better understand the impact of this disease.

Several common fungal leaf spot diseases were noted on samples, including powdery mildew and Septoria blotch. As wheat got closer to harvest both

Stagnospora blotch and scab were noted on wheat heads. The detection of tan spot (*Drechslera tritici-repentis*) (Figure 4) is notable, as this potentially serious disease of wheat had not been recently diagnosed in Michigan wheat. Lesions caused by this disease can be easily confused with those caused by other fungal leaf spot diseases.



Figure 4. Tan spot lesions on wheat. Photo credit: Mary Burrows, Montana State University, Bugwood.org

The Michigan Wheat Program and MSU Diagnostic Services look forward to continuing this program in the upcoming year. For questions or more information please contact the lab at 517-355-4536 or [pestid@msu.edu](mailto:pestid@msu.edu).

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