WHEAT VIRUS SURVEY FOR KENTUCKY DURING THE 2022 FIELD SEASON

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INTRODUCTION

Many viruses can affect wheat grown in Kentucky, but until 2021, it had been several years since a formal wheat virus survey has been conducted in Kentucky. A recent survey of wheat viruses present in the neighboring state of Illinois was published, where the following viruses were detected: barley yellow dwarf virus (pav and mav strains), wheat spindle streak mosaic virus, cereal yellow dwarf virus (strain rpv), wheat streak mosaic virus, and high plains virus (Kleczewski et al. 2020). A similar survey conducted in Kentucky in 2021 resulted in the following viruses being detected: barley yellow dwarf virus (pav strain), cereal yellow dwarf virus (rpv strain), and high plains wheat mosaic virus (Bradley et al. 2022). In addition, the bacterial pathogen that causes bacterial mosaic of wheat, *Clavibacter michiganensis* subsp. *tessellarius* (Cmt) was detected frequently in both the Illinois and Kentucky survey.

METHODS & MATERIALS

Wheat leaf samples were collected from wheat 78 wheat fields, representing 23 counties (Table 1). For each field 20 leaves were sampled blindly from a 600 m transect through the field, where samples were collected every 30 m. Samples were frozen until all were accumulated, and then were delivered to Adgia Inc. (Elkhart, IN), where they were tested for eleven different viruses and Cmt using enzyme linked immunoassay (ELISA) tests.

RESULTS

Out of the eleven viruses that were tested for, only three were found in the samples tested. High plains wheat mosaic virus was found in 13 samples (16.7%), and wheat streak mosaic virus was found in in 1 sample (1.3%). The bacterial mosaic pathogen, Cmt, was found in 77 samples (98.7%).

CONCLUSIONS

In general, a low number of samples tested positive for any viruses. Out of the viruses detected, high plains mosaic virus was detected the most often (16.7% of samples tested). The bacterial mosaic pathogen of wheat, Cmt, was detected in nearly every wheat field tested. This is similar to what was reported by Kleczewski et al. (2020), in which Cmt was detected in a large percentage of wheat fields in Illinois. This wheat virus survey will continue in 2023, which will help determine if these viruses occur every year in a low percentage of fields.

REFERENCES

Bradley, C. A., Mehl, K., Neves, D., and White, N. 2022. Wheat virus survey for Kentucky during the 2021 field season. University of Kentucky Wheat Science Research Reports. https://wheatscience.ca.uky.edu/files/2021_c_bradley_-wheat_virus_survey_2021_rr.pdf.

Kleczewski, N., Chapara, V., and Bradley, C. A. 2020. Occurrence of viruses and *Clavibacter michiganensis* in winter wheat in Illinois, 2009 to 2011 and 2019 to 2020. Plant Health Progress 21:317-320. https://doi.org/10.1094/PHP-07-20-0060-S.

ACKNOWLEDGEMENTS

TABLES

Table 1. Counties surveyed and number of fields sampled within each county for a wheat virus survey conducted in Kentucky in 2022.

County	No. field sampled
Adair	1
Ballard	8
Caldwell	2
Calloway	2
Carlisle	2
Christian	8
Daviess	4
Fayette	1
Fulton	3
Graves	5
Henderson	6
Hickman	2
Lincoln	2
Logan	5
Lyon	2
Marshall	2
McLean	1
Nelson	3
Simpson	5
Todd	4
Trigg	3
Union	4
Warren	3

Table 2. Results of ELISA tests for detection of viruses and the bacterial mosaic pathogen.

Pathogen tested	No. samples positive (out of 78)	% samples positive
Brome mosaic virus	0	0
Barley stripe mosaic virus	0	0
Barley yellow dwarf virus - mav	0	0
Barley yellow dwarf virus - pav	0	0
Clavibacter m. tessellarius	77	98.7
Cereal yellow dwarf virus - rpv	0	0
High plains wheat mosaic virus	13	16.7
Potyvirus group	0	0
Soilborne wheat mosaic virus	0	0
Tobacco mosaic virus	0	0
Wheat streak mosaic virus	1	1.3
Wheat spindle streak mosaic virus	0	0