

Wheat Virus Survey for Kentucky During the 2021 Field Season

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INTRODUCTION:

Many viruses can affect wheat grown in Kentucky, but it has 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). In addition, the bacterial pathogen that causes bacterial mosaic of wheat, *Clavibacter michiganensis* subsp. *tessellarius* (Cmt) was detected frequently in that survey.

PROCEDURES:

Wheat leaf samples were collected from wheat 62 wheat fields, representing 20 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.

County	No. field sampled
Adair	1
Ballard	4
Caldwell	3
Calloway	3
Carlisle	3
Christian	5
Crittenden	1
Daviess	3
Fayette	2
Fulton	3
Henderson	3
Hickman	3
Hopkins	1
Lewis	1
Logan	1
Lyon	6
McLean	1
Muhlenberg	3
Todd	13
Woodford	2

RESULTS:

Out of the eleven viruses that were tested for, only three were found in the samples tested. Barley yellow dwarf virus-pav was found in 4 samples (6.5%), Cereal yellow dwarf virus-rpv was found in 2 samples (3.2%), and High plains wheat mosaic virus was found in 1 sample (1.6%) (Table 2). The bacterial mosaic pathogen, Cmt, was found in 25 samples (40.3%).

Pathogen tested	No. samples positive (out of 62)	% 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	4	6.5
Clavibacter m. tessellarius	25	40.3
Cereal yellow dwarf virus - rpv	2	3.2
High plains wheat mosaic virus	1	1.6
Potyvirus group	0	0
Soilborne wheat mosaic virus	0	0
Tobacco mosaic virus	0	0
Wheat streak mosaic virus	0	0
Wheat spindle streak mosaic virus	0	0

CONCLUSIONS:

In general, a low number of samples tested positive for any viruses. Out of the viruses detected, barley yellow dwarf virus-pav was detected the most often (6.5% of samples tested). The bacterial mosaic pathogen of wheat, Cmt, was detected in over 40% of the fields 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 2022, which will help determine if these viruses occur every year in a low percentage of fields.

REFERENCE:

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>.

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