

Addressing New Pest Developments in a Small Grain IPM System – 2015- 2016

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The primary objectives of the this 3 year program (2013 - 2016) are (1) Aphid management as it relates to both new thresholds and barley yellow dwarf virus (BYDV) management and (2) Weed management of newly emerging weeds and resistance management. Fusarium head blight monitoring and management has also been added to this project for the 2015 through 2017 seasons.

(I) Weed Survey and Management Results – 2015 – 2016

Please refer to document entitled “Weed Survey and Control of Key Weed Species in Small Grains” – authors: Mark Van Gessel, Extension Weed Specialist and Barbara Scott, Research Associate Weed Science

(II) Aphid Monitoring and Barley Yellow Dwarf Virus (BYDV) Surveys and Testing

One objective of this survey was to evaluate sampling techniques and new potential action thresholds developed in the south for managing aphids in small grains. A second objective was to identify fields with BYDV and critical plant stages for aphid control to reduce losses due to BYDV. There are four species of aphids that infest small grains in Delaware; bird cherry oat, English grain, corn leaf, and green bug aphid, all of which are capable of transmitting BYDV.

For the third year, we surveyed twenty-nine small grain fields on a weekly basis from mid-October to early December 2015 and twice in the spring of 2016 to determine aphid species composition, and the abundance of aphids. Field were sampled by examining one foot of row in ten random locations throughout each field and recording the number of aphids for each species. In the fall of 2015 and spring of 2016, these same field were also surveyed for BYDV symptoms. In mid-April (barley) and mid-May (wheat) fields were evaluated for symptoms of BYDV by randomly looking at ten tillers in ten random spots throughout each field. Only symptomatic samples were collected and sent to Agdia, Inc. for a BYDV screen. Symptomatic tillers included purpling and yellowing of the leaves and/or stunting.

Summary of Aphid Population Levels

The unusually warm fall and winter favored aphid production and as a result, aphid populations were greater in the fall of 2015 compared to the previous two years. Similar to last year (2014-2015), the English grain aphid was the predominant species in the fall, contributing 82% of the total aphids detected. Other aphid species detected included the bird cherry oat (17%), corn leaf (<1%) and greenbug aphid (<1%). The bird cherry oat aphid is the main species responsible for vectoring the severe strain of BYDV. It should be noted that populations of this aphid were presently mainly in late

winter and early spring. Thirty four percent (10 fields) of the small grain fields sampled reached the new “potential” action threshold in the fall of 2015. Seven of the fields that reached the threshold being evaluated were sprayed with an insecticide targeting aphids.

Summary of BYDV Screening:

In the spring, each field included in the survey was sampled for BYDV symptoms by visually inspecting ten random tillers in ten spots throughout each field. The total number of tillers with potential BYDV symptoms was recorded to determine the incidence and symptomatic tillers were collected to screen for BYDV and to document the strain of virus. Barley yellow dwarf virus was detected in 32% (9) of the fields surveyed with an incidence level ranging from 1 to 8% of the plants infected. Although the incidence levels in both the spring of 2015 and 2016 were higher compared to 2014, these levels are still low and yield loss was not documented for these levels. Since bird cherry oat aphid did increase in late winter (after we finished sampling), there is a possibility that some vectoring occurred late winter/early spring. Although spring vectoring of BYDV has not resulted in economic yield loss in years past, this aspect of BYDV management may need further investigation.