Pest e-alerts

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Vol. 16, No. 25 http://entoplp.okstate.edu/pddl/pdidl **5/30/2017**

Wheat Disease Update – 27 May 2017

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This past week I traveled and looked at wheat in north-central/northwestern OK at Alva and Cherokee, as well as wheat in the panhandle. I also looked at wheat here around Stillwater and in central OK near Kingfisher/Okarche (30-35 miles northwest of OKC). Wheat in central OK and around Stillwater is or quickly will be ready for harvest, weather permitting. Wheat across northern OK (Cherokee and Alva) was quickly approaching maturity but kernels were still soft and some green was still present in stems/heads. Wheat in the panhandle ranged from ¼ to full kernel, with stems and leaves still quite green in many varieties.

Leaf rust is still active in the panhandle area, and samples testing positive for *Wheat streak mosaic virus*, *High plains virus*, and *Barley yellow dwarf virus* continue to come to the Diagnostic Lab. In some fields I saw (and in talking to producers), it is difficult to see where the mites/virus originated, but grassy weeds and perhaps volunteer crops such as sorghum or corn may be the most likely source. For more information on mite-transmitted wheat viruses such as WSM, please see OSU Fact Sheet EPP-7328 (Wheat Streak Mosaic, High Plains Disease, and Triticum Mosaic: Three Virus Diseases of Wheat in Oklahoma) available at http://pods.dasnr.okstate.edu/docushare/dsweb/HomePage

One abiotic disease (a disease not caused by a pathogen) that is being reported is a head darkening or head melanism (Figure 1). Reports of this darkening have come from southwestern and central OK, as well as from northern OK around Blackwell/Tonkawa/Ponca City.

Figure 1. Head darkening (melanism) as seen in the Lahoma variety trial in late May.

Although this darkening has been observed in several varieties, it seems to be most noticeable in the variety Bentley. Dr. Carver had noticed a head darkening in Bentley prior to its release, but apparently environmental factors this year have caused it to be expressed more strongly than in years prior. One of the parents of Bentley is TAM 303, which was developed by Dr. Jackie Rudd at Texas A&M University. Dr. Rudd sent the following information: "*Bentley has the same "fluorescent" green glumes early and dark red/brown chaff color at maturity as TAM 303 which is one of its parents. TAM 303 and many of its descendants normally have 1-2% of near black heads that look like your photos. Most are sterile or have a few shriveled seeds. This is not an impurity, and is expressed more in some environments than others. It is sometimes spotty in a field and sometimes scattered throughout. Our take on it was that it was just a concentration of the unique TAM 303 glume color in sterile heads- whatever might have caused the sterility. Freeze related sterility is a common culprit for us. For us, almost all TAM 303 derived lines that have the fluorescent green heads, would also have some of these black heads if we had sterility.*" Dr. Carver has indicated that during the development of Bentley, he took seed from dark heads and planted that seed to see if there was any effect on the next generation of wheat plants. He did not see any effect on the next generation either in wheat yield or in the incidence of dark heads. However, in some environments seed from darkened heads may not be as plentiful or "full" as seeds from non-darkened heads (Figure 2).

Figure 2. Seed taken from a dark and non-dark head of Bentley wheat.

In summary, this head darkening that has been observed in Bentley and other varieties appears to affect seed yield and kernel filling, and is related to the genetics of the variety that is induced by an unknown stress or combination of stresses.

Plant Disease and Insect Diagnostic Laboratory

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Director of Oklahoma Cooperative Extension Service, Oklahoma State University, Stillwater, Oklahoma. This publication is issued by Oklahoma State University as authorized by the Vice President, Dean, and Director of the Division of Agricultural Sciences and Natural Resources.