PLANT DISEASE AND INSECT ADVISORY

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Bunts & Smuts of Wheat

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Karnal bunt: Testing of wheat produced in Oklahoma in 2006 for the presence of Karnal bunt has been completed. All 65 grain samples from Oklahoma tested negative for the presence of Karnal bunt. Testing of this wheat was part of the USDA-APHIS National Survey Program that is used to help ensure the marketability of U.S. wheat into the international (export) market.

Common bunt (stinking smut) & loose smut: During this past season I did not hear or see of any major reports of common bunt or loose smut in Oklahoma, but there was a report this summer from Kansas indicating a high incidence of common bunt in north central Kansas (see Kansas State University Extension Plant Pathology Disease Alert 06-09 at http://www.plantpath.k-state.edu/DesktopDefault.aspx?tabid=49).

The similarities of the names of these two diseases can be confusing. Common bunt (also called 'stinking smut') is indicated by a "fishy" or "musty" smell to the grain. In severe cases the grain can appear "dusty" due to the presence of black bunt spores on the kernel surfaces. In severe cases, the brush-end of the grain is blackened due to the accumulation of spores in the brush. Common bunted kernels are slightly smaller than a wheat kernel and are dark brown or black in color (Fig 1). The seed coat on these bunted kernels is easily crushed, which releases the bunt spores and the odor. During harvest, these bunted kernels are broken and the spores are released to spread to the coat of healthy wheat and to the soil. Hence, the common bunt fungus survives the summer in the soil and on the seed coat. These spores germinate in the soil when temperatures are cool (<75° F), the fungus infects young, germinating seedlings, and then the fungus grows with the developing wheat plant through the year. As the plant matures, common bunted kernels rather than healthy kernels are formed in the head. Loose smut has some similarities to common bunt, but also has some significant differences. For example, there is no smell associated with loose smut as there is with common bunt. Spores of the loose smut fungus do not reside in the soil or on the seed coat as they do with common bunt. Instead, loose smut spores released from the heads of infected wheat plants spread to the flowering heads of healthy wheat plants and infect the developing kernels. Hence, the loose smut fungus is carried inside of wheat seed. When that infected wheat seed is planted in the fall, the loose smut fungus grows with the plant through the fall and winter. At head emergence in the spring, heads covered with a mass of black, powdery spores emerges instead of a typical wheat head (Fig 2). These spores spread to healthy wheat heads, and thus, complete the life cycle of the fungus. Hence, wheat grain infected with loose smut does not appear different from uninfected wheat grain, and has no foul odor associated with it as does wheat grain contaminated with common bunt.

Fig 1. (L) Healthy and common bunted kernels of wheat (bunted kernels emit a “fishy” or “musty” odor) and (R) spores of the common bunt fungus trapped on the “brush” end of wheat kernels (these spores will germinate and infect the wheat seedling from this seed in the fall).

Fig 2. Loose smut of wheat (no “fishy” odor or intact bunted kernels are associated with loose smut of wheat).

Control of common bunt and loose smut is most readily accomplished by treating seed with a registered fungicide effective against the bunts and smuts. Most of the fungicides available for control of common bunt are systemic fungicides (fungicides that are taken up by the plant). In general, the systemic fungicides are more effective in controlling common bunt/stinking smut than the protectant fungicides (fungicides that stay on the surface of the plant). In some cases, a treatment is a mixture of a systemic with a protectant fungicide, and sometime the treatment includes an insecticide along with the fungicide. HENCE, be sure to read the labels to see which are effective against common bunt and loose smut. Remember, a systemic fungicide is critical for controlling loose smut because the fungus that causes this disease actually resides inside of the seed. Hence, a protectant fungicide on the seed coat will not enter the germinating seedling and will not control the disease. ALSO, be sure seed is completely and thoroughly covered to obtain effective control. Planting treated seed every year (or at least every other year) is a sound practice to follow to avoid the initiation and increase of common bunt and loose smut. Controlling common bunt and loose smut is particularly important because of the always-present threat of Karnal bunt, which is a bunt that has the same "fishy' or "musty" smell as common bunt. Hence, elimination of common bunt and loose smut also helps to avoid the risk of common bunt being misidentified as Karnal bunt.

For more information on common bunt, Karnal bunt & loose smut, see http://entoplp.okstate.edu/ddd/hosts/wheat.htm, consult the, "2006 OSU Extension Agents' Handbook of Insect, Plant Disease, and Weed Control (OCES publication E-832)," and/or contact your County Extension Educator.

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