Hardin County Extension News Release
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Wheat Harvest Date Reminders

Hardin County – While many areas of Ohio have already successfully harvested wheat, there are fields that still need to be harvested. With rainfall this week, harvest may be delayed. Late harvest coupled with excessive rainfall means more time for late-season mold growth, mycotoxin accumulation, test weight reduction, and sprouting; all of which could result in poor overall grain quality. In 2018, OSU evaluated wheat harvested on June 29 (at 12% moisture content) and July 8 (at 14% moisture content). Grain moisture increased between June 29 and July 8 due to 0.58 inch of rainfall between the two harvest dates. When wheat harvest was delayed until July 8, yield decreased by 9 bushels per acre, test weight decreased by 2.9 bushels per acre, and vomitoxin level increased by 0.86 ppm. These reductions in yield and test weight and increase in vomitoxin are likely attributed to re-wetting of dry grain.

Test weight (grain weight per unit volume or grain density) is one of the grain quality traits most likely to be affected by harvest delay and wet conditions. Low test weights usually occur if grain is prevented from filling completely or maturing and drying naturally in the field. Rewetting of grain in the field after maturity but prior to harvest is one of the main causes of reduced test weight. When grain is rewetted, the germination process begins, causing photosynthates (i.e., starch) to be digested. This leaves small voids inside the grain which decreases test weight. Additionally, grain will swell each time it is rewetted and may not return to its original size as it dries which will also reduce test weight. Thus, the enlarged kernels will take more space but weigh the same, allowing fewer kernels to pack in the measuring container, lowering the test weight.

Rain and harvest delay may also lead to pre-harvest sprouting in some varieties. Sprouting is characterized by the swelling of kernels, splitting of seed coats, and germination of seeds (emergence of
roots and shoots) within the wheat heads. Some varieties are more tolerant to sprouting than other, and for a given variety, sprouting may vary from one field to another depending on the duration of warm, wet conditions. Sprouting affects grain quality (test weight). Once moisture is taken up by mature grain, stored reserves (sugars especially) are converted and used up for germination, which leads to reduced test weights. Even before visual signs of sprouting are evident, sugars are converted, and grain quality is reduced. Since varieties differ in their ability to take up water, their drying rate, the rate at which sugars are used up, and embryo dormancy (resistance to germination), grain quality reduction will vary from one variety to another.

In addition to sprouting, the growth of mold is another problem that may result from rain-related harvest delay. To fungi, mature wheat heads are nothing more than dead plant tissue ready to be colonized. Under warm, wet conditions, saprophytic fungi (and even fungi known to cause diseases such as wheat scab) readily colonize wheat heads, resulting in a dark moldy cast being formed over the heads and straw. This problem is particularly severe on lodged wheat. In general, the growth of blackish saprophytic molds on the surface of the grain usually does not affect the grain. However, the growth of pathogens, usually whitish or pinkish mold, could result in low test weights and poor overall grain quality. In particular, in those fields with head scab, vomitoxin may build-up to higher levels in the grain, leading to further grain quality reduction and dockage. While vomitoxin contamination is generally higher in fields with high levels of wheat scab, it is not uncommon to find above 2 parts per million vomitoxin in late-harvested fields that have been exposed to excessive moisture. Even in the absence of visual scab symptoms, the fungi that produce vomitoxin may still colonize grain and produce toxins if harvest is delayed.

To minimize grain quality losses, it is best to harvest wheat on the first dry-down. Harvesting at a slightly higher moisture level (18% for example) may also be useful for minimizing quality losses, particularly those associated sprouting and mold growth due to rainfall and harvest delay. However, if grain is harvested at moisture above 15%, it should be dried down below 15% before storage to minimize mold growth and mycotoxins in storage.

Article written by Laura Lindsey and Pierce Paul-OSU Extension, Ag Crops Team and edited by Mark Badertscher-OSU Extension, Hardin County

Photo caption: Hardin County wheat harvest is mostly completed with yields reported between 76-105 bushels per acre, moisture ranging from 12.5%-17.5% with good grain quality and test weights.