

## Reduction of DON (deoxynivalenol) in wheat samples after removal of FDK

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Fusarium is a fungus that affects cereal crops and causes Fusarium head blight, (FHB) also known as tombstone and wheat scab. There are three species of fungus that cause FHB including *Fusarium avenaceum*, *F. graminearum*, and *F. culmorum*. Grains infected with FHB appear chalky and shriveled, causing reduced and poor quality crop yields which result in economic losses.

For this particular project, *F. graminearum* was studied. It has been found that this species is capable of producing mycotoxins which are byproducts of the fungi's metabolism and are usually toxic to mammals. One in specific, deoxynivalenol (DON), is a vomitoxin which causes nausea, vomiting and other gastrointestinal problems. Due to this, crops infected with the fungus are not desirable for human or animal consumption as beef and dairy cattle, swine, poultry and horses all do not tolerate DON well.

This project tested the theory that the concentration of DON should decrease if the Fusarium damaged kernels (FDK) are removed from a sample of wheat. Through Enzyme-Linked Immunosorbent Assay (ELISA) a quantitative analysis of the DON concentration will be found in parts per million. The ELISA test consists of a series of control and sample wells. In these wells, there is an enzyme that competes with the free DON in the samples for antibody binding sites. A reagent is added that causes a blue color change that is compared to the color of the controls to give the amount of DON in the sample. More blue indicates less DON was present in the sample.

Thus the concentration of DON before removal was tested with ELISA to gain an initial concentration of DON. Then a sample of kernels was placed on a wheel apparatus that separated the healthy from the damaged kernels. The healthy kernels were then tested with ELISA to determine how much DON was in the sample. This was compared to the initial concentration in order to determine if DON was successfully reduced by removing the FDK. If this proves successful, it may be used to reduce the amount of DON in wheat crops, thereby increasing the market value.



Student JD McIntosh, Tutor Amanda Reinisch, Student Richard Koroll and Project Supervisor Dr. David Prystupa get acquainted at MSA Meet and Greet July 2<sup>nd</sup>.



Richard and JD speak to Open House guests about their research project on July 19<sup>th</sup>.