








### STEP ONE: Identify and Quantify the Mold(s) Present

It is important to remember that the presence of visible molds is only an indicator and needs to be identified and quantified to determine its potential negative impact.

- If 10% of the ears have mold present that covers more than 25% of the ear, send in a representative sample for proper identification.
- Below is an example of Plant Pathology Labs (for identification) where you can send samples:
  - North Dakota State University | Tel: 701-231-8362
    - E-mail: [plantpathology@ndsu.edu](mailto:plantpathology@ndsu.edu) | Web: <http://www.ag.ndsu.nodak.edu/diaglab/>
  - South Dakota State University | Tel: 605-688-5545
    - Email: [SDSU.pdc@sdstate.edu](mailto:SDSU.pdc@sdstate.edu) | Web: [http://plantsci.sdstate.edu/planthealth/row\\_forage/subpage.cfm?ID=12](http://plantsci.sdstate.edu/planthealth/row_forage/subpage.cfm?ID=12)
  - University of Minnesota | Tel: 612-625-1275
    - Email: [pdc@umn.edu](mailto:pdc@umn.edu) | Web: <http://pdc.umn.edu/>
  - University of Wisconsin – Madison | Tel: 608-262-2863
    - E-mail: [bdh@plantpath.wisc.edu](mailto:bdh@plantpath.wisc.edu) | Web: [www.plantpath.wisc.edu/pddc](http://www.plantpath.wisc.edu/pddc)

APPEARANCE	TYPE	DESCRIPTION	MYCOTOXIN POSSIBLE?
	<b>Diplodia</b>	Initially appears as a white mold beginning at the base of the ear but eventually becomes grayish-brown and rots the entire ear. The mold may be apparent on the outside of the husk or on the shank. There may be raised black bumps on the moldy husk or kernels.	<b>NO*</b>
	<b>Gibberella</b>	Develops as a red or pink mold that almost always begins at the tip of the ear. The silks and husks may stick to the ear due to mold growth. In severe cases, the pink mold is visible on the outside of the husks at the ear tip. The fungus produces the mycotoxin vomitoxin.	<b>YES</b>

*\*Even if mycotoxins are not present feeding and palatability of the grain may still be affected.*

APPEARANCE	TYPE	DESCRIPTION	MYCOTOXIN POSSIBLE?
	<p><b>Fusarium</b></p>	<p>Symptoms include a white to pink, cottony mold that can begin anywhere on the ear but often begins with insect-damaged or split kernels. Usually the entire ear is not rotted and affected kernels are scattered across the ear. Infected kernels are usually tan or brown or have white streaks. The fungus produces the mycotoxin fumonisin.</p>	<p><b>YES</b></p>
	<p><b>Aspergillus</b></p>	<p>Appears as a grayish-green powdery mold that may begin at the tip of the ear or follow insect injury tracks. Infected kernels are brownish, lightweight, and shrunken. The fungus produces the mycotoxin aflatoxin.</p>	<p><b>YES</b></p>
	<p><b>Penicillium</b></p>	<p>Green or blue-green powdery mold that occurs between the kernels usually at the ear tip. Infected kernels can appear bleached or streaked.</p>	<p><b>YES</b></p>
	<p><b>Cladosporium</b></p>	<p>Dark green or black powdery mold that also causes black streaks on kernels. It usually forms first where kernels are attached to the cob.</p>	<p><b>NO*</b></p>
	<p><b>Trichoderma</b></p>	<p>Dark green mold that grows on or between kernels and often covers the entire ear. This disease typically is not economically damaging because it only occurs on scattered ears.</p>	<p><b>NO*</b></p>

*\*Even if mycotoxins are not present feeding and palatability of the grain may still be affected.*

## **STEP TWO: Contact Crop Insurance Agent**

There are provisions within some policies to cover low test weight, kernel damage, and other quality issues. It is important that you contact your Crop Insurance Agent immediately if you believe you might have a plant disease that will affect grain quality.

## **STEP THREE: Mycotoxins – Detect if Present, then Identify and Quantify**

If the mold detected in step 1, is **greater than 10,000 cfu/gram** and is of the Aspergillus, Fusarium, Gibberella or Penicillium strains, then a mycotoxin screening should be completed.

- Contact your Crop Insurance Agent. In this situation, samples must be pulled from the field by a loss adjuster prior to the grain being placed into storage. Penicillium toxins may not be covered under the policy, check with your agent.
- Either you or loss adjuster will need to send in a representative sample for proper mycotoxin screening (examples below). Again check with your agent for the proper procedure.
  - [Veterinary Diagnostic Lab, North Dakota State University](#)
    - 174 Van ES Hall, Fargo, ND 58105 | Phone (701) 231-8307
  - [Veterinary Diagnostic labs, Iowa State University](#)
    - 1600 South 16<sup>th</sup> Street, Ames, IA 50011 | Phone(515) 294-1950
  - FOR PENICILLIUM: [Trilogy Labs](#),
    - 870 Vossbrink Dr., Washington, MO 63090 | Phone: (636) 239-1521

## **STEP FOUR: Harvest and Storage Management Strategies**

### **Dry Grain**

Harvesting – Harvest and dry the grain in a “continuous-flo dryer” to a moisture level of 14% and then cool to ambient air temperature as quickly as possible.

- Plenum temperatures should range from 190-210 degrees for this crop to qualify as useable.

Storing - Begin the cool-down process as soon as your grain goes into storage.

- A 60,000 bushel bin with a 20 hp fan at 4” static pressure will give you 1/3 CFM of air.
- It will take 3 days of operation to reduce grain temperatures by 10 degrees.
- Ultimately you want grain to be cooled down to 30-35 degrees for safe storage. As outside air temperatures start to go down, you will want to get the grain cooled down as quickly as possible.

Monitoring – Stored grain should be evaluated weekly until sold.

- One person should access the bin by the manhole using the ladder and have another person at the lower level start the fan letting it run 3-5 minutes.
- Have the man on the top level check the air quality in the bin to make sure there is no condensation, and that the air is fresh and cool and that the static pressure gauge stays at the same reading as the previous week!

Marketing – Once the crop that has experienced plant disease issues has been properly harvested and stored prospective buyers should be contacted to determine how they want to evaluate the marketability of the crop.