

Do You Know DON?

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No, we are not talking about your neighbor or relative. This is in reference to Fusarium Head Blight, also known as scab or DON, which is a fungal disease that significantly effects wheat and barley crops. This could be a potential concern to Wyoming's farmers, whom produced 4.75 million bushels of wheat and 6.74 million bushels of barley in 2014. This fungus is found on and attacks the grain of the crop causing yield loss, low test weights, low seed germination, and mycotoxin contaminated grain, which results in lost revenues for farmers and potential rejection of the harvested grain at elevators. The main identifying symptom for this disease is bleaching of some florets in the crop's head prior to maturity, while severe infections can cause premature bleaching of the entire head. Infected kernels often have pink or orange colored mold on them and are often shriveled, white and chalky in appearance.

The disease is caused by several species of fungi from the group known as Fusarium, hence the name. *Fusarium graminearum* is the most common. This disease can be introduced into a field by spores blown in by the wind or contaminated seed. Like most fungi, Fusarium Head Blight thrives in warm moist conditions which can be caused through rain, irrigation, fog and/or long evening dew events. Therefore, this disease is more prevalent in irrigated fields than dryland. However dryland fields can get this disease if climatic events lineup correctly. Once established in a portion of the field this disease spreads rapidly throughout the area by wind and splashing water. The most susceptible portion of the wheat and barley plant is the head, and in particular when the crop is flowering. After the growing season the fungus overwinters on crop residue and can re-infect a following wheat or barley crop. It should also be noted that Fusarium Head Blight can also persist and colonize corn and other grass crops such as forage grasses.

So what can be done to prevent or reduce this disease? First of all, if there is no history of scab in your fields, neighbor's fields, or county, then the chances are extremely low and probably not a huge concern. If there is a concern of potential infection then following an integrated pest management (IPM) or multifaceted approach is highly recommended.

Typically the first recommendation for IPM would be to use resistant varieties. Currently there are several spring wheat varieties that are tolerant, though there are no barley or winter wheat varieties. The next management implementation is crop rotation, which breaks the cycle of the disease and declines the fungi population that causes reinfection, especially if a legume crop or broadleaf crop is rotated between grain crops. Research has proven that Fusarium Head Blight infection is two times higher when wheat is planted into wheat stubble than when wheat is planted into soybean stubble. Research has also revealed that infections to wheat and barley are 5 to 10 times higher when planted after a corn crop. Wheat or barley crops are also at risk if they are planted adjacent to last years infected fields.

The next management strategy to implement would be the removal of the grain crop residue. Unfortunately this disease is benefited by soil health practices of residue retention through no till, minimum till and strip till because the residue allows the disease to persist in the environment until the next host crop (wheat, barley, corn or grasses) can be infected. Montana's 2015 malt barley crop saw

fairly high infections of fields that were planted after corn and were almost a guarantee of an infection for barley that was directly planted into corn stubble (no-till system). Effective means for handling crop residue are burning, burying, or complete removal.

Irrigation management can also be used to decrease the potential risk of scab infection. If possible, time irrigation to prior and after flowering of the crop. This practice would provide adequate water to the crop while leaving a dry microclimate in the crop canopy that is less favorable to the fungi. Though not necessarily an option to farmers, it is worth noting that furrow or flood irrigation can provide a slightly drier crop canopy than pivot or areal irrigation and typically does not spread the disease through the splashing of water droplets on infected crop material.

If the prior management practices fail to prevent an infection and an infection is found early enough, then a fungicide is the last option. Fungicides only suppress the disease, they do not kill or eliminate it. For fungicides to be effective at suppressing the disease, application timing is crucial and should occur at the first sign of anthers extruding from the wheat head or directly prior to barley head emergence. Fungicide products are locally systemic, meaning they only protect the tissue they are applied to and not the entire plant. The most effective fungicides provide about 50% control compared to untreated crops, so do not base your full management plan on chemical control.

In summary, if there is no history of this disease in your area then this is probably not a large concern. However, if there is a history, then this disease is controllable with sound management practices. Fusarium Head Blight needs warm humid conditions during flowering to favor an infection and production. Rotating crops from cereal crops to non-cereal crops will aid in breaking the disease's life cycle. Removal of cereal crop residue will further aid in breaking the disease's life cycle. Planting barley or wheat after corn, especially into corn stubble, greatly increases the risk of infection. Fungicides only suppress the spread and impact of the disease on the crop, it does not kill the fungus. For more information please contact your local extension office or industry representative.