

# TECHNICAL TOPICS

VOLUME 1

## SHOULD YOU SPRAY FOLIAR FUNGICIDE ON YOUR SILAGE CORN THIS YEAR?

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### KEY TAKEAWAYS

- *Fusarium* molds are always present in soil and plant debris, putting silage corn at risk for infection every year.
- Wet weather combined with hot days and cool nights is optimal for mold growth, which sets the stage for the production of mycotoxins in the corn silage.
- Fungicide applied to diseased corn has shown to decrease mycotoxin levels and improve plant digestibility by improving nutrient content in the corn silage as a result.
- Monitor the amount of diseased corn in your fields before determining if spraying fungicide is right for you, as application can be costly.
- Apply fungicide during R1 phase of corn silage growth.



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# SHOULD YOU SPRAY FOLIAR FUNGICIDE?

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Due to 2018 growing conditions and the wet spring, there has been much talk about whether to spray silage corn with fungicide this year. The stress of the 2018 growing season brought about several corn diseases including gray leaf spot, tar spot, and northern leaf blight. These diseases proceeded to cause high levels of mycotoxins in the corn silage. The current long, wet spring suggests this year's growing season may be just as ripe for allowing these diseases and subsequent mycotoxins to develop again. I'm sure many of you are asking yourselves what you can do to combat the environmental challenges affecting your corn silage crop.

## Why are molds and mycotoxins bad?

Molds tend to grow best in high humidity and temperatures that fluctuate between hot days and cool nights. *Fusarium* molds, which cause multiple diseases in corn, can exist in the soil and on plant debris, so it is always around to cause infection given the right environmental conditions.

Mold growth on silage corn will negatively affect its nutritional quality. Mold will compete with the corn plant and decrease nutrient quality as the plant sheds leaves or increases lignin to reduce the spread of the mold. It can also cause dry matter (DM) loss and reduced palatability. Northern leaf blight was found to increase neutral detergent fiber (NDF) and acid detergent fiber (ADF) concentration in the corn silage compared to plants free of disease. Similar findings were discovered with silage corn infected with Southern Rust. The resulting corn silage had increased DM

concentration, increased NDF and ADF, and decreased in vitro DM digestibility compared to corn silage free of disease.

*Fusarium* molds are responsible for producing mycotoxins like vomitoxin, T2, Zearalenone, and fumonisin. Vomitoxin or deoxynivalenol is the most commonly detected *Fusarium* mycotoxin. Vomitoxin in cattle is associated with gastrointestinal upset and reduced performance. In 2018, Adisseo's Mycotoxin Survey found that more than 70% of corn and corn silage samples from across the U.S. were contaminated with DON. In addition, 49% of corn silage samples were contaminated with ZEN. ZEN mimics estrogen causing reproductive problems in cattle. A study that examined diets contaminated with 1.5 ppm ZEN and 1.0 ppm DON showed decreased intake, decreased milk production, diarrhea, and reproductive failure. Mycotoxins not only decrease reproduction and performance, but also immune and organ function. More specifically, T2 causes immunosuppression, while Fumonisin causes mild liver disease. Due to the high presence of these toxins in 2018, and the likelihood of similar weather conditions this year, your corn silage crop is yet again at risk for mold and mycotoxin.



## What can fungicide do to keep silage corn healthy?

Recent research shows that fungicide application to corn can aid in digestibility of the plant and can reduce mycotoxin levels compared to corn that has not been treated with fungicide. A study by Haerr et al. (2015) found that corn silage treated with fungicide tended to have a higher feed conversion than corn silage not treated with fungicide. Cows tended to eat less dry matter intake (DMI) but produced the same amount of milk. In addition, a follow up study by Haerr et al. (2016) tested digestibility of corn silage treated with fungicide by placing it directly in the cow's rumen. They found that the soluble fraction of DM, NDF, and ADF decreased as fungicide treatments increased. They concluded that the silage corn treated with fungicide had higher DM digestibility than silage corn not treated with fungicide as a result of the lower fiber content. In 2017, a trial done by the University of Wisconsin, in partnership with Rock River labs, found a significant reduction of 50% or more in DON content in treated corn silage compared to corn silage that was not treated with fungicide, indicating fungicide treatment can aid in reducing mycotoxin concentrations. They repeated the trials in 2018 and again found some reduction in DON. In summary, fungicide application does show a likelihood to increase corn silage digestibility but needs further research to conclude significant digestibility changes. Fungicide does, however, reduce mycotoxin levels, which will positively impact the quality of your corn silage.

## How and when to apply fungicide?

To determine if you need to spray fungicide, begin by scouting your fields for any mold growth. If you begin to spot mold in the lower canopy, you can use this to predict how much more it may spread and cause losses based on future weather predictions that support mold growth. Spraying the fungicide on a crop that shows signs of disease will help control the disease and subsequently preserve yield and nutrition of the plant. Due to the cost of fungicide, in order to maximize your return on investment (ROI), it is best to spray fungicide on fields that are already diseased or

## RETHINKING THE PARTICLE SIZE IN RATIONS

With the onset of new corn kernel processing technology, the ability to increase the theoretical length of cut on corn silage has moved the dairy industry sharply in this direction. Recent work and discussions have attempted to address the question: "How far is too far when it comes to length of cut?" If the particle length gets too long, fermentation quality can be reduced due to silo packing density, especially as the crop matures and dries out. Research from the Miner Institute (Chazy, NY) has shown that as the forage quality decreases, there may be an advantage to reducing the cut length of the crop in order to expedite the flow of material through the rumen, clearing the rumen for more feed to come in. Data also suggests that cows chew their diet to a set particle length before swallowing. Longer cut forages take longer to chew to this particle length and therefore, feed intake may be reduced. This is not to suggest that we hastily return to previous targets for theoretical cut length, as pushing to extremes may have its limits. Our goal is to maximize the efficiency of milk production and cow health— in addition to placing the correct diet in the mangers, optimal cut length will help the cows achieve this.

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have the greatest risk of disease. To target the whole corn silage plant, application can begin at R1 (silking) and end around 10 days after the start of R1. The greatest reduction of DON was found when fungicide was applied at the start of R1. Take note that fungicide reduces DON only in the ear, and it may still accumulate in the stalks, so it is still useful to monitor the level on DON in your corn silage. Some have questioned the need to spray at the early vegetative stage, such as V6 (sixth-leaf stage), but due to the excellent air flow at this stage, there is not much risk for mold growth from heat and humidity. In addition, the ear leaves are not formed at this time and will not benefit from fungicide application. If harvesting the ear or the corn only from your corn silage, you should spray during tasseling (VT) stage to target the ear and corn grain of the plant.

### **Cost of application?**

Applying at the VT or R1 stage will require use of custom application by highboy or aerial application. Application costs can be as much as \$30/acre for custom application, but the fungicide itself is around \$12/acre. Some can consider, with high disease pressure, to carry out a second treatment two or three weeks later. To maximize ROI, treatment should be considered only when mold infections run above 10%. ROI will become even higher when weather conditions are predicted to support mold growth.

*References are available upon request*

## **RULE CHANGES TO PREVENTED PLANTING PROVISIONS FOR 2019 CROP YEAR**

The Risk Management Agency has modified the rules for the 2019 crop year only. These rule changes allow for the prevent plant crop to be harvested as silage, and the harvest can begin no earlier than September 1, 2019. Corn and soybeans apply to this adjusted ruling. The crop must be planted according to ag expert guidelines. Approval from a crop insurance agent is necessary before any plan is implemented. Harvesting this crop as a silage does not affect the prevent plant payment for those acres. The University of Wisconsin Extension bulletin can be found here:

[tinyurl.com/y5d42gd4](http://tinyurl.com/y5d42gd4)

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