SHOULD I BE APPLYING FUNGICIDE TO MY FALL FORAGE OAT CROP?

DAEMON SMITH, EXTENSION FIELD CROPS PATHOLOGIST, DEPARTMENT OF PLANT PATHOLOGY

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Record prevent-plant acres and lack of on-farm forage has pushed WI farmers into trying alternative cropping systems in 2019. A record number of late planted oats have been planted with the intention of being used as a forage. Oats, planted the first week of August can be expected to produce 2.5 to 3 t DM/a in an average year. Co-blentz, USDA Dairy Forage Research Center, found that a late-maturing forage cultivar (ForagePlus) produced maximum annual yields ranging from 2 to 3.5 t DM/a. Because the forage cultivar matured slowly it was better able to respond to sometimes erratic late-summer precipitation. These oat types mature later and produce more tonnage of quality forage. In addition, fall planted oat is higher in forage quality than spring planted oats. Research at the University of Wisconsin by Albrecht found that maturation of summer-sown (August) oats was delayed, resulting in 10 to 15% less neutral detergent fiber (NDF), 18% greater digestibility, and 250% more water soluble carbohydrate than spring-sown oat. With all of the cool wet weather in 2019 and lush plant tissue, these oats are likely to be challenged with crown rust. The question being posed today is should farmers be spraying these fall forage oats with a fungicide?

We are being up front here…we don’t have any empirical data to speak from so this our best educated GEUSTIMATE. The oat crown rust pathogen (Puccinia coronataf. sp. avenae) can quickly overcome genetic resistance in oat grain varieties. That means that certain varieties have better partial resistance than others, which can result in differences in yield and quality parameters in years when crown rust is significant. Examples of these differences can be found below:

Response of Four Oat Varieties to a Plant Growth Regulator and Foliar Fungicide Combination in 2019
It is important to know the level of resistance to crown rust that your variety has. This might dictate how often you scout in order to make your fungicide spray decision.

When it comes to fungicide efficacy, many products are very effective against oat crown rust. Haugen et al. at North Dakota State University conducted fungicide evaluations on oat for grain in 2014-2016. In all years fungicide was applied at flag leaf emergence. Products used included Headline®, Priaxor®, Tilt®, and Quadris®. In the 2015 and 2016 data, normalized difference vegetation index (NDVI) was recorded to measure quality of the vegetative portions of the plant. In all cases fungicide improved the NDVI scores relative to the control. Not surprisingly, a corresponding increase in yield was observed relative to the higher NDVI scores in the fungicide-treated oats. While these data are from oats for grain, it highlights the fact that fungicide can indeed protect oat plants from crown rust and delay disease development, resulting in greener, healthier vegetative plant parts.

When making the decision to apply fungicide on oats for forage, it appears that there are several products which are effective for controlling crown rust. Given the current farm economy, it might be good to find a product that is cheap, yet effective, to keep the cost of this input low. Several of the strobilurin only fungicides are labeled for control of rust in oats for forage. These include Headline® and Quadris®. Others might be available, however, read the labels very carefully. Be sure that oats for forage or hay is indicated on the label. Also be sure you know what the pre-harvest interval (PHI) is for the product you choose. Some of these products cannot be harvested for 7, 14, or more days after application for forage. Additional fungicide options may be found in A3646, Pest management in Wisconsin Field Crops. Again, read any labels VERY carefully to be sure that the product can be used for oats for hay and forage.

Given the upward limitations of forage yield ~2 to 3.5 t DM/a it is difficult to know what dry matter differences we can expect; however, the most likely benefit of a fungicide application on forage oats would be in forage quality. Given the market prices and lack of cash flow in agriculture right now if a grower chose to do this practice a lower cost product that was efficacious on the oat crown rust would be the best choice.

**VEGETABLE CROP UPDATE #21**

AMANDA GEVENS, ASSOCIATE PROFESSOR & EXTENSION SPECIALIST, POTATO & VEGETABLE PATHOLOGY, PLANT PATHOLOGY DEPARTMENT

**UPDATE 21 – SEPTEMBER 2, 2019**

- Potato production updates (N trials and remote sensing)
- Cucurbit downy mildew updates
- Potato/tomato late blight updates
- Potato disease DSVs and PDays
YIELD AND QUALITY OF JULY PLANTED CORN

DR. JOE LAUER, UW-MADISON AGRONOMY AND EXTENSION STATE CORN SPECIALIST

The Kernels

• Corn has two peaks in forage quality: one at pollination and one at 50% kernel milkline.

• Bareness generally reduces yield and grain content resulting in increased fiber content, but this is often accompanied by lower lignin production that increases fiber digestibility. Also, the forage has higher sugar content, and higher crude protein than normal corn silage.

• Relatively small changes (5 to 8% decrease) in forage quality (Milk per ton) occurs with July planting dates compared to corn planted April 28 to June 1.

• Milk per acre of July planting dates decreased 17 to 92% to levels ranging from 2,300 to 24,000 lbs milk/ A.

(The two page Agronomy Advice fact sheet is attached at the end of this newsletter.)

WISCONSIN FRUIT NEWS VOL. 4, ISSUE 11

CHRISTELLE GUEDOT, FRUIT CROP ENTOMOLOGY AND EXTENSION SPECIALIST, WISCONSIN-MADISON FRUIT PROGRAM

• Brian Smith of UW-River Falls reports on his research on strawberry hybrids, stone fruit hybrids, and cold-hardy grapes.

• Updates from the UW-Madison, Division of Extension Plant Disease Diagnostic Lab and the Insect Diagnostic Lab.

• Brix is increasing in grapes. Find out more in the grape variety developmental stages and fruit maturity evaluation.

• The grape scouting report says grape phylloxera galls continue to be observed on all cultivars at the research stations.

• The Door County Report says this week or next week are the best times to hedge in cherry orchards.
WEATHER UPDATE 2019

DR. JOE LAUER, UW-MADISON AGRONOMY AND EXTENSION STATE CORN SPECIALIST

View the latest weather summary for 2019 and the Normal (30 previous years – 1989 to 2018) at Arlington and Marshfield from April 1 to September 3.

Note: A predictive corn GDU model was added to the Arlington and Marshfield graphs (bottom right). The graph describes the number of GDUs remaining to achieve R5 and R6 before a killing frost. If average GDUs accumulate normally, then corn (105 d RM = full-season) planted at Arlington prior to June 1 should achieve the R5 stage before an average killing frost. At Marshfield, corn (95 d RM = full-season), GDU accumulation has been slower than normal for all planting dates, except July 1. Corn planted prior to June 1 should achieve the R5 stage by a killing frost.

You can also download graphs for the current year and other years at http://corn.agronomy.wisc.edu/Season/. Links to current and previous season weather summaries are located on the left of the web page.
Yield and Quality of July Planted Corn

Joe Lauer, Corn Agronomist

The Kernels

- Corn has two peaks in forage quality: one at pollination and one at 50% kernel milkline.
- Bareness generally reduces yield and grain content resulting in increased fiber content, but this is often accompanied by lower lignin production that increases fiber digestibility. Also, the forage has higher sugar content, and higher crude protein than normal corn silage.
- Relatively small changes (5 to 8% decrease) in forage quality (Milk per ton) occurs with July planting dates compared to corn planted April 28 to June 1.
- Milk per acre of July planting dates decreased 17 to 92% to levels ranging from 2,300 to 24,000 lbs milk/ A.

Record high prevent plant acreage occurred in 2019. In July, many acres were planted to cover crops, including corn (Figure 1). Due to low forage inventories, USDA-RMA allowed cover crop acres to be harvested for silage.

Corn has two peaks in forage quality: one at pollination and one at 50% kernel milkline. Forage quality as measured by Milk per Ton is high during vegetative phases prior to flowering. Like all forages, quality decreases after flowering. Unlike other forages, quality improves beginning around R3. The early peak in forage quality at pollination is high in quality but too wet for ensiling. The later peak is more familiar and is the one we typically manage for when producing corn silage because it maximizes both biomass yield and quality.

If pollination is unsuccessful, the forage quality following the first peak does not change and will continue to remain high due to higher sugar content (water soluble carbohydrates), higher crude protein, higher crude fiber and more digestible fiber than normal corn silage.

Unsuccessful pollination (bareness) generally reduces yield and grain content resulting in increased fiber content, but this is often accompanied by lower lignin production that increases fiber digestibility. If pollination is poor yet some kernels are developing, the plant can gain dry matter and farmers should wait with harvest.

Harvesting and Handling Barren Corn

The harvesting challenge is that green, barren stalks will contain 75-90% water. Barren corn is difficult to harvest because it is rank and too wet for silage storage structures. Arlington UW-ARS staff have had some success using a discbine to cut barren corn into a windrow. The windrow would need to dry to desiccate the forage. A forage chopper with a hay pickup attachment is then used to gather and chop the windrow into a wagon for transport to a storage structure for ensiling.

Grazing is an option but be careful about nitrate toxicity problems. If grazing, consider potential for nitrate toxicity. This is especially likely to be a problem if growth was reduced to less than 50% of...
normal and/or high levels of nitrogen were applied. If the decision is made to harvest the crop for ensiling, the main consideration will be proper moisture for storage and fermentation. The crop will look drier than it really is, so moisture testing will be critical. Be sure to test whole-plant moisture of chopped corn to assure yourself that acceptable fermentation will occur.

**Forage quality of barren and poorly pollinated corn**

Coors et al. (1997) evaluated the forage quality of corn with 0, 50 and 100% pollination of the kernels on an ear during 1992 and 1993. These plots were harvested in September.

A typical response of corn to stress is to reduce grain yield. Bareness reduced whole-plant yield by 19% (Table 1). Kernels on ears of 50% ear fill treatments were larger and tended to more than make up for reduced numbers (Albrecht, personal communication). With the exception of protein, as ear fill increased, whole-plant forage quality increased.

**Yield and Quality of July Planted Corn**

We conducted experiments during 2005 and 2006 to determine what could be expected by planting corn in July. Three corn hybrids (brown midrib, full-, and shorter-season) were planted on five different dates from April 28 to August 1 at Arlington, WI. The 2005 growing season had a killing frost on October 26, which was three weeks later than normal.

Seasonal dry matter production after planting during July ranged from 0.7 to 7.5 Tons DM/A while the same hybrids planted April 28 to June 1 produced 8.7 to 10.0 T DM/A (Table 2). Milk per acre is significantly lowered 92 to 17% to levels ranging from 2,300 to 24,000 lbs milk/A for planting dates in July. Crude protein, NDF and NDFD increased with later planting dates. Although, little starch content was measured in later planting dates, overall milk per Ton tended to decrease slightly. Thus, relatively small changes in Milk per ton occurred during planting dates in July with levels ranging from 2800 to 3200 lbs milk/T, which was a 5 to 8% decrease from corn planted April 28 to June 1.

Corn can produce significant dry matter yield when planted during July, but the amount produced depends upon when a killing frost occurs. Growers need to check on options available from their insurance companies before taking action and planting corn in late June and July for emergency forage. Herbicide labels must be adhered to before switching to other crops.

**Table 1. Forage yield and quality of corn with differing amounts of pollination (n= 24; 1992 and 1993).**

<table>
<thead>
<tr>
<th>Ear fill</th>
<th>Forage yield</th>
<th>Crude protein</th>
<th>NDF</th>
<th>ADF</th>
<th>IVTD</th>
<th>NDFD</th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>0</td>
<td>81</td>
<td>8.5</td>
<td>57</td>
<td>30</td>
<td>74</td>
<td>52</td>
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<td>54</td>
<td>93</td>
<td>8.0</td>
<td>54</td>
<td>28</td>
<td>76</td>
<td>52</td>
</tr>
<tr>
<td>100 (control)</td>
<td>100</td>
<td>7.5</td>
<td>49</td>
<td>26</td>
<td>77</td>
<td>54</td>
</tr>
<tr>
<td>LSD (0.05)</td>
<td>6</td>
<td>0.3</td>
<td>1</td>
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**Table 2. Corn forage yield and quality response to July planting dates.**

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<thead>
<tr>
<th>Planting date</th>
<th>Forage yield T DM/A</th>
<th>Forage moisture %</th>
<th>NDF</th>
<th>NDFD</th>
<th>Starch</th>
<th>Milk per Ton Lbs/T</th>
<th>Milk per Acre Lbs/A</th>
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<td><strong>2005 - Killing frost on Oct. 26</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>April 29</td>
<td>9.5</td>
<td>57</td>
<td>43</td>
<td>60</td>
<td>34</td>
<td>3420</td>
<td>32400</td>
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<td>June 1</td>
<td>10.0</td>
<td>52</td>
<td>46</td>
<td>59</td>
<td>32</td>
<td>3280</td>
<td>32800</td>
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<td>June 30</td>
<td>7.7</td>
<td>58</td>
<td>51</td>
<td>62</td>
<td>20</td>
<td>3240</td>
<td>24800</td>
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<tr>
<td>July 15</td>
<td>5.6</td>
<td>69</td>
<td>54</td>
<td>66</td>
<td>12</td>
<td>3210</td>
<td>18100</td>
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<td>August 1</td>
<td>2.8</td>
<td>77</td>
<td>59</td>
<td>73</td>
<td>1</td>
<td>3110</td>
<td>8700</td>
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<td>LSD (0.10)</td>
<td>2.4</td>
<td>4</td>
<td>3</td>
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<td>160</td>
<td>2800</td>
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<td><strong>2006 - Killing frost on Oct. 12</strong></td>
<td></td>
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<td>April 28</td>
<td>9.1</td>
<td>64</td>
<td>45</td>
<td>57</td>
<td>33</td>
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<td>42</td>
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<td>55</td>
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<td>3120</td>
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<td>78</td>
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<td>2820</td>
<td>10000</td>
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<td>68</td>
<td>83</td>
<td>0</td>
<td>3170</td>
<td>2300</td>
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<tr>
<td>LSD (0.10)</td>
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<td>3</td>
<td>2</td>
<td>2</td>
<td>110</td>
<td>2900</td>
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