January 30, 2020

Volume 2, Issue 1

Blacklands IPM Update

GENERAL:

Wheat in the area is growing and setting tillers good, and there is no major issue being observed in any of the scouting program fields. There are a few issues we need to keep an eye out for as our current weather conditions are favorable for disease development. Additionally, there area few insect pest that we need to watch for, but that have not been found in any of the wheat fields in the scouting program.

DISEASE:

The weather conditions over the last week or so has become very favorable for disease development with our frequent rains, high humidity, foggy and dewy mornings, and mild temperatures. The two diseases we need to keep watch for currently are powdery mildew and stripe rust. ‘

Powdery mildew is favored by mild temperature (59°-71°F), high relative humidity, and dense stands. Unlike our rust diseases powdery mildew does not need the leaf to be wet for an extended period for infection to occur but the dew in the canopy has driven canopy humidity up as the day progress. This disease affects yield by causing a reduction in the number of heads per acre, kernel size, and test weight. The earlier in the year powdery mildew infections occur the higher the potential there is to see an economic yield loss from the disease, which is why we need to keep an eye out and treat once the disease is becoming present throughout the field. Infections begin in the lower canopy where the humidity will be higher and the temperature lower than what weather stations are reading, and then move up the canopy if favorable growth conditions remain in place. Symptoms of powdery mildew is powdery white to gray fungal growth on leaves and stems (**Figure 1**). At first the fungal growth will have a white powdery appearance that will eventually change to a greyish brown color with time. On the opposite side of the leaf from the fungal growth the leaf tissue will appear yellow at first and then eventually turn to a tan to brown color as the fungus kills the cells in that region of the leaf. Management options for powdery mildew include planting varieties with resistance to powdery mildew, avoid excess Nitrogen being applied, and the use of fungicides. Texas A&M AgriLife Extension updates the varieties characteristics of common wheat varieties years and is published in the Texas Wheat Variety Trial Results (https://varietytesting.tamu.edu/files/wheat/2019/2019-Wheat-Publication-1030.pdf) and on the wheat resources page on the Hill County Texas A&M AgriLife Extension webpage (http://counties.agrilife.org/hill/files/2020/01/2020-TAMU-Wheat-Variety-Characteristics.pdf). Applying excess amounts of Nitrogen promotes tiller formation which leads to a dense canopy, and also increases the susceptibility of the crop to plant diseases. There are a number of fungicides on the market that will effectively manage powdery mildew, and their application should be made based on the presence and severity of powdery mildew in the field, if the variety is susceptible or resistant to powdery mildew, if the future weather conditions appear to be conducive for growth, and the market price should help in the fungicide selection.

Figure 1. Powdery mildew of wheat. Photo credit: Brian Olson, Oklahoma State University, Bugwood.org (left) and Phil Sloderbeck, Kansas State University, Bugowood.org (right)

Stripe rust sometimes referred to as yellow rust (**Figure 2**), is another foliar disease that we need to keep an eye out for as the weather conditions over the last we weeks have been favorable for disease development. The spores that cause stripe rust infections must be blown in from areas to our South which receive their spore load from Mexico, and to date I have not heard of any reports of stripe rust infection in areas to our south. Stripe rust is most active which temperatures are between 50° and 64 F°, and need the leaves to be wet for at least 6 hours for spores to infect the leaf. The pustules of stripe rust are oblongs and are formed in a line along the leaf vein, hence the name stripe rust. You can differentiate stripe rust from leaf rust by the color of the pustules and the shape, stripe rust pustules will be a yellowish orange while leaf rust pustules are more reddish orange. Stripe rust can be managed by fungicides and planting resistant variety. The resistance ratings published by Texas A&M AgriLife Extension for all Hard Red Winter wheat varieties is based mature plants and may not kick in until the plant reaches the flag leaf stage. It is important to know your variety's characteristics and check your field weekly to understand how the disease is developing in the field to know if a fungicide needs to be applied. Past Texas A&M AgriLife Research and Extension trials have show that very few Hard Red Winter wheat varieties have seedling resistance (stages up to jointing), while most Soft Red Winter wheat varieties have seedling resistance to stripe rust. Fungicides can be used to effectively manage stripe rust infections in wheat, and fungicide applications should be made based on the presence of active pustules throughout the field, yield goal, if the weather conditions are favorable for disease development, and market price.

Figure 2. Stripe rust of wheat showing stripes of yellowish orange pustules. Photo credit: D. Tyler Mays

INSECTS:

There are two insects we need to keep a lookout for including the greenbug and the bird-cherry oat aphid. Both aphids are known vectors of viruses like Barley Yellow Dwarf Virus, but only the greenbug injects a toxin into the leaf while feeding that will cause the leaf to turn yellow and eventually die. Green bugs are pale green with a dark green stripe down the middle of their back (**Figure 3**). They are favored by temperatures between 55 and 95 F and are known to cause economic losses. The threshold for greenbugs is based on the plant height and the number of aphids per linear foot (**Table 1**).

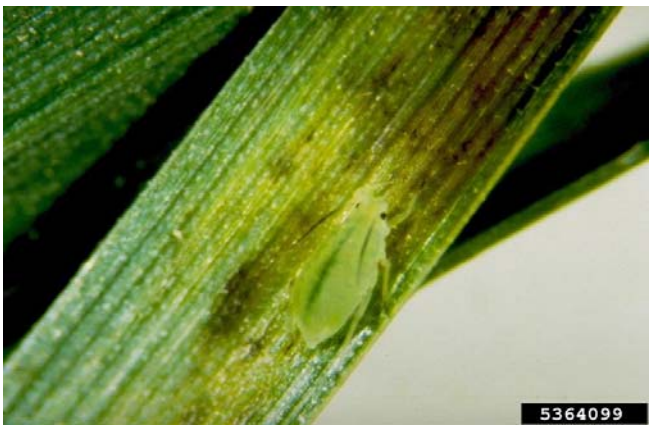

Figure 3. Greenbug feeding on wheat leaf. Photo credit: Frank Peairs, Colorado State University, Bugwood.org

Table 1. Texas A&M AgriLife Extension Service Greenbug Threshold

Plant Height (inches)	Number greenbugs per linear foot
3-6	100-300
4-8	200-400
6-16	300-800

Bird-cherry oat aphids do not inject a toxin into the plant while feeding and can be yellow green, dark green or black with a reddish orange area around the base of their cornicles (stovepipes; **Figure 4**). Unlike the greenbug the bird-cherry oat aphid is less damaging and rarely reaches populations that warrant an insecticide application. Insecticide treatment for bird-cherry oat aphid may be necessary if the number are high and the crop is under moisture stress, or to the spread of Barley Yellow Dwarf Virus within the field. Texas does not have an established economic threshold for bird-cherry oat aphid, and it is recommended to use the Nebraska threshold as a guide and is based on the number of bird-cherry oat aphids per tiller at different growth stages (**Table 2**) .

Figure 4. Bird-cherry oat aphids, note the overall dark green appearance with reddish brown on the back at the base of the cornicles. Photo credit: Adam Sisson, Iowa State University, Bugwood.org

Table 2. University of Nebraska Bird-Cherry Oat Aphid Threshold

Average number of Bird-Cherry Oat Aphid per tiller to meet threshold				
Preboot	Boot to Heading	Flowering	Milky Ripe	Milk to Medium Dough
20	30	>5	10	10
Modified from: Gary Hein and John Thomas. May 4, 2006. Insecticides for Control of Aphids in Wheat. https://cropwatch.unl.edu/insect/wheataphids				

Blacklands IPM Update is a publication of Texas A&M AgriLife Extension IPM Program in Hill & McLennan Counties.

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