

GENERAL:

Wheat continues to progress well with minimal disease issues. Insect activity in terms of true armyworms has increased over the last week, with more fields getting close to their respective economic thresholds. Corn planting resumed earlier this week on the Western and Northern parts of Hill County, and corn that has emerged looks good with no current pest issues. A cold front move through the area last weekend (4/11-4/12) and dropped temperatures into the middle to upper 30s in the mornings between Monday and Wednesday at the Hillsboro Municipal Airport. Based on these temperatures there is a chance we could see some frost issues in both our wheat and corn crops.

WHEAT:

Disease issues remain low at the time with glume blotch and black chaff present in area fields at low areas. True armyworms are being found in more wheat fields each day, but I still only know of two fields that needed to be sprayed for true armyworms in the area. Most of the wheat in the area has finished flowering and some of our older wheat is in the early to medium dough stage depending on the variety's maturity rating.

Black chaff symptoms have started to show up in a few fields and based on the weather forecast we could start seeing black chaff in more wheat fields in the coming days. Symptoms of black chaff include purplish black to brown discoloration of the glume that starts as longitudinal stripes and on the stem between the flag leaf and head (**Figure 1**). This disease is seed borne and to prevent possible issues with black chaff in future fields, seed infected with black chaff should not be held for planting in the fall. This pathogen is also known to survive in the soil on infected crop debris and infected stubble should be tilled under if wheat is going to be planted the next growing season. For more information you can see the 2019 newsletter that covered the disease at <http://counties.agrilife.org/hill/files/2019/04/Blackland-IPM-Update-Issue-7.pdf> , or the Texas Row Crop Newsletter published last year at <https://agrilife.org/texasrowcrops/2019/05/10/bacterial-streak-and-black-chaff-small-grains/> .



Figure 1. Black chaff symptoms on the glumes (left) and stem (right).

True armyworm numbers increased over the last week, but I do not know of any other fields than the two fields reported last week that needed to be sprayed for true armyworms. Current infestations are floating between 1 and 2 true armyworms per square foot, which is still below the economic threshold of 4 to 5 true armyworms per square foot. The true armyworms will hang around for about another 7 to 10 days, because their eggs hatched sporadically over about a 14 day period leading to worms ranging between 1/8 of an inch up to as large as 1 inch. True armyworms populations can be managed by insecticide applications, but early detection and timely application are key to effectively manage the field's true armyworm population. Due to where our wheat crop is growth stage wise, we need to pay close attention to the preharvest intervals of insecticides when choosing an insecticide to apply. A list of recommended insecticides for true armyworm management in small grains can be found in the Managing Insects and Mite Pest of Texas Small Grain guide which can be found at <http://counties.agrilife.org/hill/files/2019/02/Managing-Insect-and-Mite-Pests-of-Texas-Small-Grains.pdf>.

Air temperatures on Wednesday morning (4/15) dropped down to 36°F at the Hillsboro Municipal Airport. This temperature recording is raising concerns of frost and/or freeze damage to area wheat fields. It is very likely for other areas of Hill County to reach lower temperatures based on field topography and boundaries. Low lying areas and parts of fields along tree lines are most at risk for seeing these lower temperatures because the trees will slow wind down and allow for the colder air to settle. We did have winy conditions Tuesday night into Wednesday morning, which probably helped protect area wheat fields from frost or freeze damage. Most of our wheat is past the flowering stage and into the milk to soft dough stage of grain development, while some of our later planted fields are just passing the flowering stage. Throughout the spring wheat is sensitive to cold temperatures starting at the jointing stage. Wheat is most sensitive to wheat from the jointing stage through pollination. At the flowering stage temperatures at or below 30°F for two or more hours can cause damage, and if temperatures reach 28°F for at least two hours can be damaging to wheat in the milk and dough stage (Table 1). Freeze damage to wheat in the flower stage can cause sterile florets, white heads and awns, and possibly damage to the lower stem. At the milk stage freeze damage can cause white heads and awns; kernels that are shrunken, discolored, or roughened; leaf discoloration; and possibly damage to the lower stem. Symptoms at the dough stage include kernels that are shriveled and discolored, and poor germination of seed when planted again. These symptoms will not be visible for 3 to 5 days after the event, depending on how the temperatures respond. Based on the temperatures recorded I doubt that we will see freeze or frost damage to area wheat.

Table 1. Injury Symptoms of Wheat Resulting from Freezing Temperatures

Growth Stage	Approximate Injurious Temperature (minimum two hours)	Symptoms	Yield Effects
Tillering	12 °F	Leaf chlorosis; burning of leaf tips; silage odor; blue cast to field	Slight to Moderate
Jointing	24 °F	Death of growing point; leaf yellowing or burning; lesions, splitting, or bending of lower stem; odor	Moderate to Severe
Boot	30 °F	Floret sterility; head trapped in boot; damage to lower stem; leaf discoloration; odor	Severe
Heading	30 °F	Floret sterility; white awns or heads; damage to lower stems; leaf discoloration	Severe
Flowering	30 °F	Floret sterility; white awns or heads; damage to lower stems; leaf discoloration	Severe
Milk	28 °F	White awns or heads; damage to lower stem; leaf discoloration; shrunken, roughened, or discolored kernels	Moderate to Severe
Dough	28 °F	Shriveled, discolored kernels; poor germination	Slight to Moderate

Table developed from <https://sanangelo.tamu.edu/extension/agronomy/agronomy-publications/freeze-injury-on-wheat/>

CORN:

The cold temperatures we experienced on the morning from Monday through Wednesday could have some negative impacts on our corn crop, especially corn that was planted while experiencing temperatures in the 30s °F are the most sensitive. The corn that is emerged and growing is less sensitive to these cold temperatures because our crop has not reached the V6 (6 leaf collars visible). The V6 growth stage is a key stage in the development of a corn plant because at this stage the plants growing point moves from being below the soil surface to above the soil surface.

Recently planted corn is most sensitive to big temperature swings like we saw between (4/12 and 4/15). If corn is planted and soil temperatures drop below 50°F we can see imbibitional injury from the seed absorbing cold water. The risk for imbibitional injury increases if the soil temperatures drop below 50°F and rain before the temperatures rise above 50°F. Imbibitional injury is caused by the plant cells becoming elastic and may rupture, and can cause stunting or death of the radical and/or seminal roots, corkscrewing of the mesocotyl (stem that pushes the seedling up out of the soil), delayed emergence, and failure to emerge or leafing out underground. Imbibitional injury to corn seedlings can also increase the seedlings susceptibility to seedling diseases by causing both plant wounds and an extended emergence period. Looking at soil temperatures from across Hill County the 4 inch soil temperatures did drop, but did not fall below 50°F. Based on these soil temperatures we should not see any imbibitional injury to our newly planted corn areas, however low lying areas of fields and the area could have experienced lower air temperatures and dropped soil temperatures even more. Low lying area of the county and fields should be inspected for imbibitional injury to estimate the possibility of needing to replant.

The corn crop that is up and growing is between the V2 and V4 growth stage, depending on location and planting date. Currently there is no major pest issues in any of the corn fields that have already emerged. The plants tissue is sensitive to cold temperatures, but until the plant reaches the V6 growth stage and the growing point moves above the soil surface the corn plant is protected from temperature swings. Frost damage can be seen as quick as 1 to 2 days on corn plants depending on how temperatures respond after the cold temperatures. Symptoms of frost damage on corn is water-soaked leaves that will eventually turn brown, and as long as the frost event didn't kill the growing point new green leaves should be seen emerging from the whorl within just a few days. If fields are expressing symptoms of frost damage growing points of the plants should be inspected in these areas to ensure the growing point was not damaged. The plants growing point can be inspected by pulling up the whole plant including the roots and slicing the stem lengthwise with a knife. Health growing point will be white but could have a light-yellow appearance. Plants with foliar frost damage but has a healthy growing point should fully recover. Based on the growth stage of area corn and the recorded temperatures, there does not appear to be a threat of damage to the areas corn crop.

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