BLACKLANDS IPM UPDATE

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GENERAL:

Thanks to the recent rains and warmer than average temperatures the area's wheat crop is growing nicely. Insect issues remain quiet at this time, but as spring is quickly approaching there are a few insect pests that we should keep on our radar. Bird cherry-oat aphid and true armyworms favor mild spring temperatures and can cause economic loss. The Hessian fly is also active across the Blacklands Prairie of Texas, but their impact on wheat fields is still unknown as we can still have 2-3 generations before we reach harvest. Disease issues remain low, but I am picking up some leaf blotch diseases, but these diseases have very little to no impact on yield in our environment. Out biggest issue right now is vernalization, which is needed for wheat to initiate reproductive growth. The mild fall and winter have likely caused us to accumulate fewer chilling hours to date compared to recent years.

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INSECTS:

Currently our insect pest activity is low in the area, but I have heard of reports that bird cherry-oat aphids were active and transmitting barley yellow dwarf virus around the Comanche County area. I have found bird cherry-oat aphids in the wheat in Hill County, but they are currently well below the economic threshold and there are no obvious signs of barley yellow dwarf virus. I have not found or heard of true armyworm infesting wheat in the Blacklands, but as w start moving into spring they could soon become and issue. Hessian fly is being found across the Blacklands, but up until this point in the growing season they have not had a significant impact on the wheat crop.

Bird cherry-oat aphids are a common occurrence in wheat produced in the Texas Blackland Prairie. This aphid can vary in color from yellowish green to dark green, or even black with an orange to reddish orange spot around the base of their cornicles (**Figure 1**). During periods of cool weather these aphids will move down the canopy and hang out on the crown of the plant just above or below the soil surface. Populations can build rapidly much like other aphid species, however, under mild to warm temperatures their populations can crash rather quickly due to natural enemies. Recent research indicates that the direct feeding of the bird cherry-oat aphid does not cause much yield loss, but their potential to transmit barley yellow dwarf and other plant disease makes them a significant pest. In Texas we do not have an established economic threshold for bird cherry-oat aphid, and we recommend utilizing the economic threshold developed by the University of Nebraska-Lincoln Extension that is based on the crop's growth stage and the number of aphids per tiller (**Table 1**). If you are seeing pockets of heavy aphids and signs of barley yellow dwarf starting to show, an insecticide application may be justified to slow the spread of the barley yellow dwarf. If your field does reach the economic threshold, we have a wide range of insecticide options. Insecticides labeled for aphid management in small grains include dimethoate, multiple pyrethroid active ingredients, sulfoxaflor (Transform) and flupyradifurone (Sivanto). Both Transform and Sivanto are likely priced out of the wheat industry in the Texas Blacklands, but they are worth mentioning because 1) they are safe on beneficial insects, 2) they are translaminar making them rain fast, and 3) they have a longer residual activity than pyrethroids and dimethoate.

Figure 1. Bird cherry oat aphid showing the reddish orange spot around the cornicles (left) and aphid colony around the bas of the plant (right).

Table 1. Recommended economic threshold for bird cherry oat aphids in wheat

Seedling Stage (Feekes 1-9)	Boot to Heading (Feekes 10-10.5	Flowering (Feekes 10.5-10.5.4)	Milky Ripe (Feekes 11.1)	Milk to Medium Dough (Feekes 11.2-11.3)
20	30	>5	10	>10

Once again, the Hessian fly is present across much of the Texas Blacklands, especially in those fields that were planted early. It is still too early to known how bad they will impact yield this year, but if a highly tolerant or resistant variety was planted chances are they will have little to no impact on yields. Insecticide seed treatments appear to have helped area wheat fields avoid significant early season Hessian fly damage. Corn planting is quickly approaching, and some people may want to consider whether to abandon their wheat to plant corn or another crop due to Hessian fly infestation. This decision can be tricky because it is impacted by multiple factors including variety selection, time when you are making the decision, and the likelihood of additional Hessian flights later in the season. Currently, one management topic where we are missing some data for in Texas is the percentage of infested tillers in the fall, winter, and/or spring that can cause economic yield losses. If we know these values, producers and crop consultants can easily determine the potential for abandoning a wheat crop due to the probability of significant yield loss caused by Hessian fly infestations. I am currently working on collecting the data for this, but then it is recommended to use data collected by Dr. David Buntin in Georgia in the 1990s. His data indicated 4.7% tillers infested in the fall and 13.4% tillers infested in the spring was enough to cause economic loss when wheat prices were $4.50 per bushel (Table 2). As we start checking wheat fields it is important to remember that even though a variety is labeled as resistant or tolerant, they will still be infested, but they will be able to withstand higher rates of infestation before economic loss occurs.

Table 1. Economic injury levels for at three Hessian fly infestation measures in winter wheat

Commodity value ($/bu)	Gain threshold (lbs/acre)	Economic Injury		
		Fall % Tillers Infested	Spring % Tillers Infested	Spring Immatures per Stem
3.00	199	8.2	19.6	1.0
3.50	169.6	6.6	16.8	0.7
4.00	149	5.5	14.9	0.4
4.50	133	4.7	13.4	--

Gain threshold calculated based on cost of control at $9.93/acre.
-- not estimatable
Table modified from Buntin, G. David. Hessian Fly (Diptera:Cecidomyiidae) Injury and Loss of Winter Wheat Grain Yield and Quality. J. Eonon. Entomol. 92:1190-1197.

True armyworm is a common pest, that thankfully in recent years hasn't been a significant pest, but under wet and mild conditions true armyworms can easily cause economic damage. This pest typically goes unnoticed for a while since they feed only on the leaves in the lower canopy first and hide under crop debris or near the base of the plant during the day. True armyworm larvae will start moving up the canopy after they have caused extensive defoliation to the lower canopy, and as the sun is setting or during periods of cloudy weather, they will move up the canopy. The head of the true armyworm is tan and lacks the prominent white inverted "Y" on the head but has a series of narrow lines that give the head a net like appearance. The body can vary in color from green to brown and has light colored stripes running the length of the body (**Figure 2**). Their feeding in the lower canopy has a minimal impact on wheat yields, since over 80 percent of the carbohydrates to fill out the kernels is produced in the top two leaves of the plant, therefore the main goal in managing true armyworms is to protect the top 2-3 leaves from any defoliation. Insecticides applications may be justified if there are 4-5 true armyworm larvae per square foot and the lower canopy has been significantly defoliated. We have several insecticides available to help us manage true armyworm populations including pyrethroids, malathion, spinosad, spinetoram, chlorantraniliprole, and Bt based products like Dipel. Most producers will likely tend to use malathion or pyrethroid based insecticides, but if we continue to get precipitation the chlorantraniliprole based products like Vantacor, Shenzi, Besiege, and others may be more economical because they are translaminar and can provide longer periods of residual control than malathion or pyrethroid. In addition to the improved rain fastness and longer residual activity, chlorantraniliprole is safer on beneficials than malathion and pyrethroids, however, this does not apply to Besiege due to the inclusion of lambda-cyhalothrin.

Figure 2. True armyworm larvae. Photo credit: Roger Schmidt, University of Wisconsin-Madison, Bugwood.org

DISEASES:

Currently disease issues remain low, and it is still too early for us to be concerned about our two most economic diseases which are leaf rust and stripe rust. I am currently picking up some Septoria leaf blotch and Stagnospora leaf blotch. These diseases are not uncommon in our area, but due to typical weather conditions they rarely reach levels that would justify a fungicide treatment. Septoria lesions tend to start in the lower canopy on those leaves close to or touching the soil surface and move up the canopy if the weather remains conducive for disease development. Septoria lesions start out as small chlorotic spots, that become tannish as they grow in size and age. Older lesions of Septoria leaf blotch will also develop dark colored fruiting body that are evenly spaced within the lesion.

Figure 3. Septoria leaf blotch symptoms in wheat. Photo credit: Marry Burrows, Montana State University, Bugwood.org

VERNALIZATION:

As we all know we have had a milder winter this year outside from the cold snap in the middle of January. This can be an issue, because it can inhibit the crop from vernalizing and moving into reproductive growth. Vernalization requirements vary between varieties, and the temperatures at which chill hours occurs varies between 45F and 50F depending on who you talk to. There has been some discussion about if we are short on chilling hours for this year, and looking at weather data for November through January I think we are not likely to see an issue with vernalization. Looking at the weather data our average low for November was 47.3F (32F lowest), December was 39.4F (27F lowest), and January was 33.16F (13F lowest), at the Waco Regional airport. It is important to know that wheat can start picking up chilling hours as soon as it imbibes water after planting, and that chilling hour accumulation stops once the temperatures drop below freezing. Looking at the calendar, we still have some time to pick up some additional chilling hours before it is too late. We typically start seeing our wheat crop reach the jointing stage around the end of February into the early part of March.