

GENERAL:

Some much-needed rain was received across the area last week with some area getting over 1.5" of rain, snow, and ice. That moisture will help improve the small grain crops condition, and the rain prior to the snow and ice provided some protection against the low temperatures received during Thursday and Friday. Based on the crop's growth stage prior to the cold front moving in most of the wheat in the area should be safe from widespread freeze damage. There are some pests in area wheat fields, including bird cherry oat aphids, Hessian fly, and leaf rust. All these pests currently are well below any level that would justify treatment.

WEATHER:

I have not yet found any wheat that has started to joint, which is good as the crop can tolerate freezing temperatures down to about 18F for about two hours. The temperature experienced during this last freeze were likely not cold enough for a long enough period to cause death of the plants growing points, and the snow/icy cover prior to the coldest temperatures acted as a blanket and shielded the plants growing points from the extreme temperatures. Additionally, after this last cold front and looking at the 10-day forecast, vernalization should be completed shortly and will likely start seeing some jointing in our earliest planted fields and earliest maturing varieties.

INSECTS:

Portions of the Texas Blacklands are seeing more issues with Hessian fly than normal. Most of the reports of heavy Hessian fly infestations is coming from portions of the Southern Blacklands around Taylor and Thrall. I suspect there are Hessian fly in wheat in Hill and McLennan Counties, but I normally do not scout wheat for Hessian fly until later in the season as there are no management options once the crop is established. Currently I have not seen any field either in Hill/McLennan Counties or in the Southern Blacklands that has an infestation high enough to lead to a significant yield loss. Signs of Hessian fly infestations include unexplained tiller death, stunted growth, and lodging later in the season. The Hessian fly cause their damage in the larva stage, which is a creamy white cigar shaped maggot with a light green streak down the back (**Figure 1**), and after feeding for a period they form the puparium which resembles a flack seed and is dark brown to black in color (**Figure 2**). Management options for Hessian fly included crop rotation, planting a resistant variety, breaking the green bridge, insecticide seed treatment, and delayed planting to minimize the number fly flights experienced during the fall. More information on Hessian fly in wheat can be found in the Texas Row Crop Newsletter at <https://agrillife.org/texasrowcrops/2022/02/07/hessian-fly-article/>.



Figure 1. Hessian fly larvae feeding on wheat stem.



Figure 2. Hessian fly puparia on wheat stem.

Bird cherry oat aphids (**Figure 3**) were found in all but two wheat fields in the scouting program prior to the cold front last week. Their populations were very light and nowhere near treatable levels. Prior to the freeze, our beneficial population was very high with a lot of parasitized aphids being found in wheat fields across the area, and a high number of predators like lady beetles. We will have to see what impact the freezing weather last week had on our beneficial insect population, mainly our lady beetles and lacewings, as our parasitic wasps can withstand temperatures much lower than what we experienced last week. As people start top-dressing wheat, with the price of agricultural chemicals I highly recommend avoiding including an insecticide with the fertilizer for two reasons, one they are not needed at this time, and secondly they kill our beneficial insect populations that can be used to help keep aphid numbers below the economic threshold. The economic threshold for bird cherry oat aphid in wheat currently is at 20 aphids per tiller. I would also like to remind everyone that as of February 28th of this year the residue tolerances for chlorpyrifos (Lorsban) will be revoked, and starting March 1st you will not be allowed to use any chlorpyrifos-based pesticides on any crops that can be used as food. There are still a number of insecticides that can be used for aphid management in wheat including dimethoate, lambda-cyhalothrin and other pyrethroid insecticides, and our neonicotinoids like Sefina.



Figure 3. Bird cherry oat aphid.

Diseases:

Leaf rust has been found in a few wheat fields in the area, and it is not uncommon to see either leaf rust (**Figure 4**) or stripe rust (**Figure 5**) this early in the year especially when January and December are mild. However, seeing rust this early is not a cause of major concern as the spread of these diseases is slowed down dramatically when cold fronts move in and drop temperatures into the low 50s as daily high temperatures. Leaf rust is being found infecting multiple different varieties, and it is mostly lower leaves that later in the season will not contribute to the energy needed to fill out the grain in the head. It is too early for the resistance genes in most of our Hard Red winter wheat varieties to kick in as most of their resistance is adult host plant resistance which does not start working until temperatures are warmer and the plants have jointed and are approaching head emergence. Seeing the amount of leaf rust this early could however be a sign that we may have a heavy leaf rust year, and preparations for at least one or two fungicide sprays to be needed. As of right now I have not seen a disease issue in wheat that would justify treatment, but with the recent rains, and our warming temperatures if there is any wheat following wheat it is highly recommended to watch these fields for development of diseases like septoria leaf blotch, tan spot, and a few other foliar and crown/root diseases.

The table below is a summary of an applied research trial conducted last year evaluating three different fungicide programs on their ability to 1) reduce the severity of stripe rust, and 2) reduce the amount of yield loss caused by stripe rust infection. These results indicate that all fungicide programs can significantly reduce the severity of stripe rust compared to the untreated. However, grain yields were significantly higher than the untreated check when the fungicides Trivapro and Alto were used. Net returns were not significantly different, but there were some large numerical differences between the various fungicide programs.

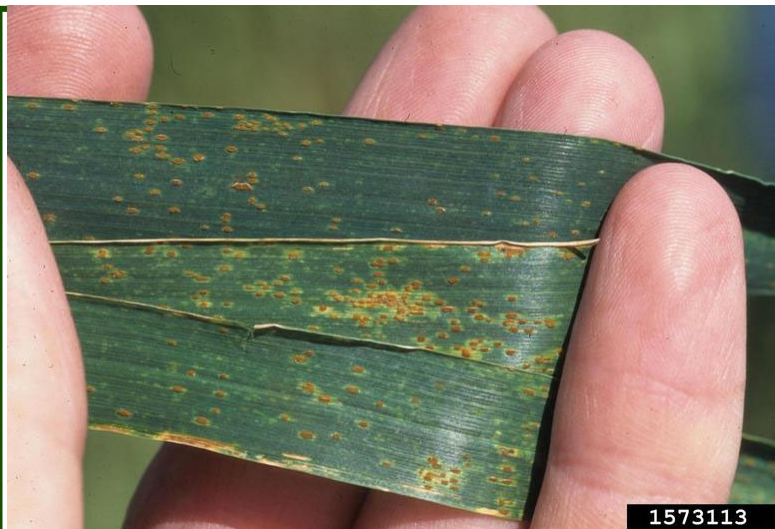


Figure 4. Leaf rust on wheat leaf. Photo credit: Gerald Holmes, Strawberry Center, Cal Poly San Luis Obispo, Bugwood.org



Figure 5. Stripe rust on wheat leaf.

Table 1. Stripe Rust Severity, Yield, and Net Returns of three fungicide programs in Wheat, Hill County, TX, 2021

Treatment and rate/A (Feekes growth stage)	Stripe Rust Severity (% of flag leaf)					Yield (bu./acre)	Fungicide Cost (\$/acre) ¹	Net Return (\$/acre) ²
	22 March	1 April	9 April	14 April	26 April			
Untreated Check	0	0	1.6	11.6	83.3 a ³	45.26 b	\$0.00	\$271.53
propiconazole 4 fl. oz. (7) tebuconazole 4 fl. oz. (10.5)	0	0	0.9	3.5	24.3 b	55.35 ab	\$3.56	\$328.51
Alto 3 fl. oz. (7) Trivapro 13.7 fl. oz. (10.5)	0	0	0.9	5.0	7.3 b	60.28 a	\$19.89	\$341.76
Trivapro 9 fl. oz. (7) Alto 3 fl. oz. (10.5)	0	0	0.2	3.5	2.4 b	62.82 a	\$14.34	\$362.55
<i>LSD (p=0.05)</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>	<i>31.92</i>	<i>11.62</i>	<i>ns</i>	<i>ns</i>

¹Average cost of product from three local ag retailers.

²Net return was calculated by subtracting the fungicide cost from the gross return which was calculated on \$6.00 wheat at local elevator.

³Means in the same column followed by the same letter are not statistically different based on F-protected LSD (p=0.05).

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Authors:
Tyler Mays, Extension Agent-IPM Hill & McLennan Counties
Zach Davis, County Extension Agent-AG/NR

126 South Covington Street
P.O. Box 318
Hillsboro, Texas 76645
Phone: 254-582-4022
Fax: 254-582-4021
Mobile: 979-482-0111
Email: Tyler.mays@ag.tamu.edu

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GENERAL:

The area's wheat crop has turned around nicely over the last two weeks. Currently pest issues are very low with some aphids in some area wheat field and are well below the economic threshold thanks to high numbers of beneficial insects. There is also some leaf rust and stripe rust in some area fields, but these pustules are old and not actively producing spores, but as we move into spring and our weather changes both diseases could become an issue. Corn planting is wrapping up for most producers in the area just as some frigid temperatures are expected to move into the area, but it does not look like it will damage the corn crop too bad at this time thanks to the current growth stages.

WHEAT:

There is no doubt that as you look at area wheat fields that this dry period has negatively impacted the wheat growth and development. At this point in time, it appears that most of the wheat in the area is a little behind where it has over the last 3-4 years. Pest issues so far this year have been low, with currently some bird cherry oat aphids, leaf rust and stripe rust being found in area wheat fields at levels well below what would justify a treatment.

Bird cherry oat aphid (**Figure 1**) is the predominant aphid species being found at the time, but I have also picked up the occasional greenbug in random fields. Both aphid species are well below the economic threshold recommended for their management. Currently there is a good number of beneficial insects around, especially parasitic wasp, that are helping keep the aphid populations well below their respective economic thresholds. With the number of beneficial insects in area wheat fields I do not recommend applying any insecticide in fields even if you are going over the field to treat for weeds, diseases, or top dressing to help preserve these beneficial insects. If for some reason you do have to treat a wheat field with an insecticide it is recommended that you select an insecticide that is selective and does not negatively impact our beneficial insect populations, if one is available for your target pest. By doing this you will keep the beneficial insect population high and floating around the field to keep aphids and other pest below the economic threshold.



Figure 1. Bird cherry oat aphid.

Both leaf rust and stripe rust has been found in a few fields in the area, but these pustules are old and not actively producing spores. Our current weather pattern is not conducive for development of either disease as the weather is going in and out of the optimum temperature range and there has not been enough moisture to facilitate infection of the crop by these diseases. Leaf rust produces a pustule that is round to oval with a dark red color and is favored by temperatures between 77°F and 86°F with high humidity from rain or heavy dew. Stripe rust pustules are yellowish orange in color that are elongated and form stripes on the leaf surface and is favored by temperatures between 50°F and 64°F with high humidity. Looking at the 10-day forecast there are very few days that favor leaf rust development, but it does appear that it could be favorable for stripe rust if there is moisture received. Additionally, I have heard reports of both leaf rust and stripe rust piking up in South Texas around Castroville, and it will be a short time before those spores make their way into our area. With wheat prices over \$10.00 per bushel and wheat yields already looking to be low it will be imperative to prevent yield loss from external factors that can be controlled like diseases and insects. Also, it will be important to select a product that will provide you the best return on investment. Table 1 summaries the results of a wheat fungicide trial conducted last year, that found that two fungicide applications will significantly limit the amount of yield lost to stripe rust. This results also indicated that yield loss can be significantly lower when applying a multiple mode of action fungicide like Trivapro early followed by a strobilurin based product at head emergence.

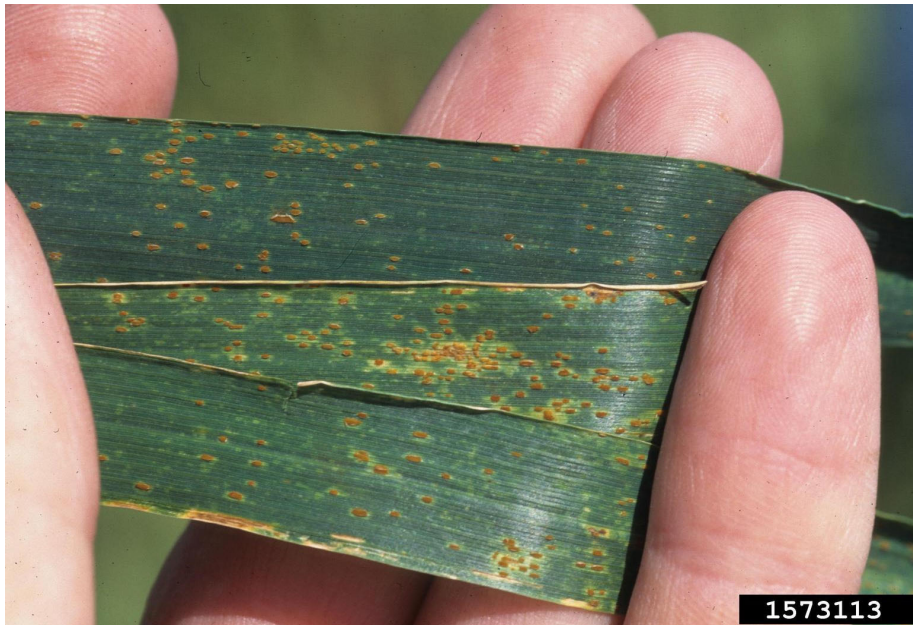


Figure 2. Leaf rust on wheat leaf. Photo credit: Gerald Holmes, Strawberry Center, Cal Poly San Luis Obispo, Bugwood.org



Figure 3. Stripe rust on wheat leaf

Table 1. Stripe Rust Severity, Yield, and Net Returns of three fungicide programs in Wheat, Hill County, TX, 2021

Treatment and rate/A (Feekes growth stage)	Stripe Rust Severity (% of flag leaf)					Yield (bu./acre)	Fungicide Cost (\$/acre) ¹	Net Return (\$/acre) ²
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CORN:

Corn planting is wrapping up across the area, with some soil moisture present at the seeding depth that should help get the crop to emergence, but a rain is desperately needed to keep the young plant growing. The forecast is calling for the lows on Saturday and Sunday morning to be near or below freezing which can be scary as the crop was just planted. The biggest issues with cold temperatures and crop planting is when the seed is planted and then imbibes cold water, and when temperatures fall below freezing and kill the growing point of the plant. The first should not be a major issue for most producers as planting operations wrapped up on Wednesday through Thursday, but for those that planted through Friday (3/11) there may be some minor damage from cold temperatures. The second issues of killing the growing point is not likely to happen as at this point the growing point is still below the soil surface which will provide some insulation. If the crop is emerged, there may be some freeze damage to the leaf tissue, but if leaves do not get killed off and then stuck in the whorl, the plant should rebound nicely.

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Authors:

Tyler Mays, Extension Agent-IPM Hill & McLennan Counties
Zach Davis, County Extension Agent-AG/NR

126 South Covington Street
P.O. Box 318
Hillsboro, Texas 76645
Phone: 254-582-4022
Fax: 254-582-4021
Mobile: 979-482-0111
Email: Tyler.mays@ag.tamu.edu

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GENERAL:

Not much has changed in the wheat crop over the last week, yet some producers are living life right and received a much-needed rain. There are a few pest situations that are present, but currently are not widespread nor are they bad enough to justify treatment. There are some fields that have tillers that have started jointing, but most of the tillers in area fields still have a while before they start jointing. Overall, this crop is about 3-4 weeks behind where it was at this time during the last three years, where jointing was observed the week of March 7, March 5, and March 10, during the 2019, 2020, and 2021 growing season respectively. This delay in crop maturity is caused by the drought conditions as well as the crazy temperature swings, we have experienced this year. Current pest I am finding in area wheat include some powdery mildew, army cutworm larvae, and bird cherry oat aphids. I have not found any leaf or stripe rust in area wheat, but there are reports of both diseases starting to be found in the Williamson County area. The strong winds experienced over this past week likely brought spores from those infections into our area, and if weather conditions remain conducive, we could soon see rust infections starting to pick up in our area.

DISEASES:

Powdery mildew has been found in some area wheat despite the low rainfall, however, for the last couple of weeks the temperatures were very conducive for development. Symptoms of powdery mildew include fluffy white to gray fungal growth that can be found on either side of the leaf and on the leaf sheaths (**Figure 1**). As the powdery mildew infection ages, the fluffy growth develops a grayish-brown color with small black dots mixed in. This disease requires high humidity with temperatures between 59 and 71F, and unlike other common fungal diseases, it does not require a period of leaf wetness for infection. Management options include crop rotation, burying infected crop residue, planting varieties with resistance to the disease, avoiding excessive Nitrogen fertilization, and fungicides. Currently I am only seeing powdery mildew on a susceptible variety, but the severity of the disease is nowhere near bad enough to justify a fungicide application, especially as disease development is greatly reduced when daily high temperatures reach 77F.



Figure 1. Symptoms of powdery mildew on a wheat leaf.

I still have not found any active leaf rust (Figure 2) or stripe rust (Figure 3) in the area but have now heard of reports of both diseases starting to be found in wheat in Williamson County. With the strong winds over the last week, it is likely that spores of leaf rust and stripe rust have been brought into the area. Given the sporadic nature of the moisture received earlier this week, along with the chance for rain this coming week we could see some area wheat fields starting to show symptoms of leaf rust and stripe rust infections. Over the next few weeks, it will be important to check wheat for symptoms of rust and treat to protect the flag leaf from being infected as it accounts for roughly 80% of the energy produced to fill out the kernels.

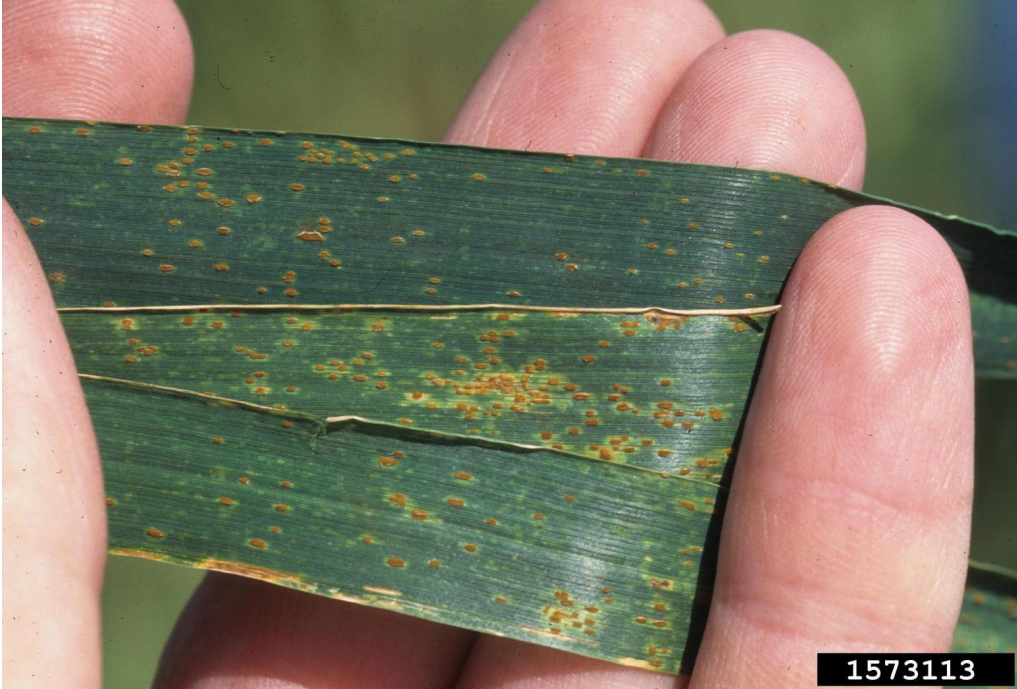


Figure 2. Leaf rust on wheat leaf. Photo credit: Gerald Holmes, Strawberry Center, Cal Poly San Luis Obispo, Bugwood.org



Figure 3. Stripe rust on wheat leaf

INSECTS:

Insect activity has been low this year, but some fields still have very low populations of bird cherry oat aphids that are being kept in check by the beneficial insect population. The second insect pest being found in some area wheat fields is the army cutworm. This insect is not widespread across the area, nor are they extremely heavy in any wheat fields that I have seen, but I have seen a good amount of by armyworm moths and army cutworm moths flying around flood lights at night. Army cutworms feed much like true armyworms by feeding on plant tissue above the soil surface, but they do go down the canopy during the day to hide in the soil or below crop residue. They can cause significant damage to wheat by defoliating the plant, and even clipping the plant from the root system as the soil surface. Fields that have thin stands due to factors like poor germination and/or tillering are the most susceptible to significant damage from army cutworms. They are more commonly an issue in fields with a lot of weeds and/or crop residue. The larvae can grow to be between 3/8th and 1 ½ inches long by the time they enter the pupal stage in early to mid-spring. The larvae have a light brown head, and a body that is a pale grayish color with white blotches and a faint brownish line down its back (**Figure 4**). Treatment for army cutworm in wheat and other small grains is recommended when there are four to five army cutworm larvae per square foot. If you do need to spray for army cutworms for some reason, there are numerous insecticide options including various pyrethroids, spinosad, and methomyl based insecticides



Figure 4. Army cutworm larvae forming the typical C-shape when disturbed. Photo credit: Frank Pearis, Colorado State University, Bugwood.org

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P.O. Box 318
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GENERAL:

Most of the area received another timely rain event that will help finish the wheat crop, keep the corn crop growing, and provide enough soil moisture to get cotton out of the ground. Corn is growing slowly despite the temperatures being favorable for rapid growth, but the low soil moisture profile is causing the corn to not grow as rapidly as it could. Cotton planting conditions continue to improve as we have received some timely rains the last three weeks, and the air temperature is averaging above 60F, and soil temperatures are at or above 65F in the top four inches. Our wheat crop is progressing nicely despite maturity being delayed due to the dry winter and early spring. Over the last ten days I have found more fields in the area with Hessian fly issues, which appear to be a function of planting date, hybrid resistance, and the warmer than normal winter. Leaf rust and stripe rust infections have started to pick up, and I have found both in southern portions of Hill County. There are also some fields around the north side of Hillsboro that are infected with wheat streak mosaic virus and infested with the wheat curl mite both of which are not common pests in the area.

WHEAT:

Both leaf rust (**Figure 1**) and stripe rust (**Figure 2**) are now active in Hill County, and currently active pustules have been found in wheat near Abbott, Bynum, Chatt, and West. At this point severity of both diseases are low, but the recent rain event could cause both diseases to spread within fields and between fields. Some field checked prior to the rain on Tuesday had leaves in the lower and middle canopy with a lot of flecking which can be an indication the plants are fighting off infection of either leaf rust or stripe rust. The recent rains and the amount of rain received in the last 21 days along with the forecasted weather indicates that both rust diseases could easily increase in incidence and severity across the region. Based on the recent rain events, forecasted weather and the current price of the July Kansas City Hard Red wheat an application of a fungicide to protect the plant from yield losses caused by either rust pathogen.

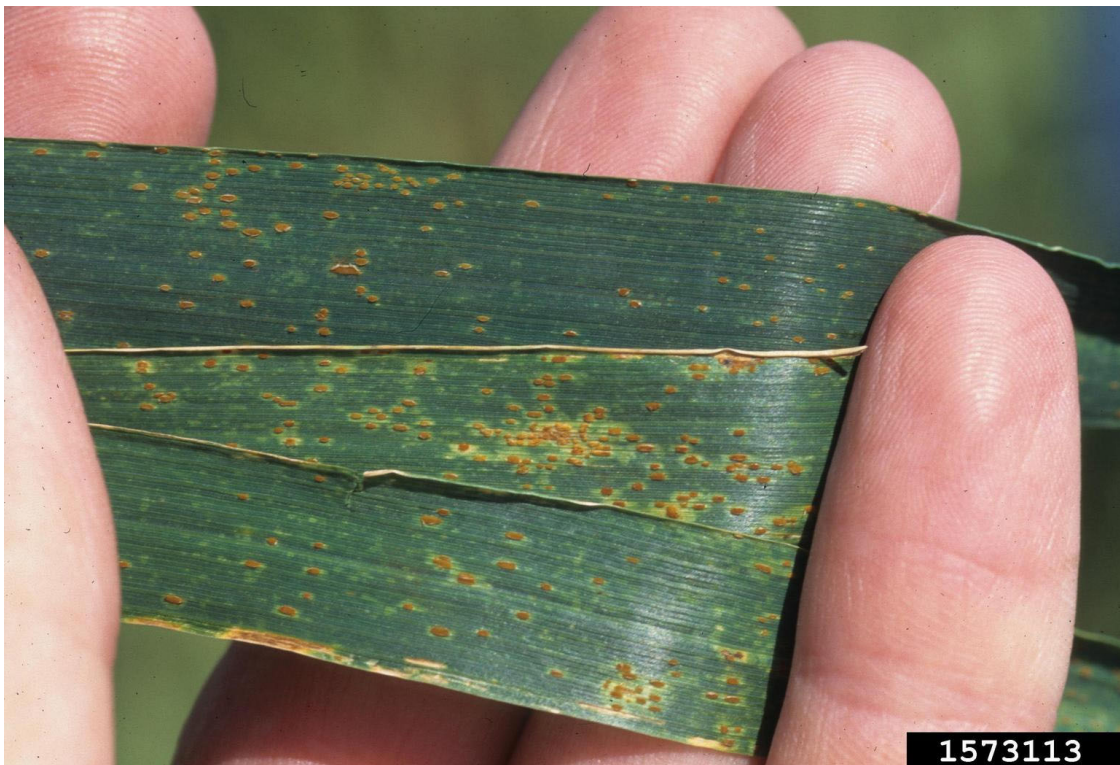


Figure 1. Leaf rust on wheat leaf. Photo credit: Gerald Holmes, Strawberry Center, Cal Poly San Luis Obispo, Bugwood.org



Figure 2. Stripe rust on wheat leaf

I have found wheat streak mosaic in a handful of fields on the northside of Hillsboro. This virus is not common in the area, and is spread through seedborne infections, the wheat curl mite, and probably other insects like various aphid species. Symptoms of wheat streak mosaic can be seen on the leaf, with a pattern of parallel broken yellow streaks (**Figure 3**). As symptoms progress the leaves of infected plants develop a mottled yellow appearance. If plants are infected early on between emergence and the start of tillering plants can become stunted and discolored. This virus can survive between wheat crops on volunteer wheat, and grassy weeds in the field and in bar ditches. Once plants are infected with wheat streak mosaic, there are no management options to minimize the effects it can have on yield except to minimize the spread of the vector to new regions of the field or new fields in the area. Viable management options for wheat streak mosaic include planting resistant varieties, control volunteer wheat and grassy weeds at least 2 weeks prior to planting, and to plant as late as possible to reduce the risk of infestation with vectors like the wheat curl mite.



Figure 3. Wheat streak mosaic virus symptoms on a wheat leaf.

The wheat curl mite has been found in fields around Hillsboro where wheat streak mosaic is being found. This mite is a small cigar shaped with a white body and will require magnification to see on the leaf surface (**Figure 4**). Unlike spider mites that are we familiar with in corn and cotton, this mite feeds on the upper leaf surface. Their feed causes the leaf margins to curl in toward the mid-rib of the leaf. This leaf curling gives infested wheat plants an onion leaf appearance. Field infestations of this mite is favored by dry warm weather, and early planted wheat crops. Because this pest lacks wings and moves slowly dispersal within the field and the environment is by wind currents, and their damage can be seen moving across the field in the same direction as the predominant wind direction. Unfortunately, foliar miticides in the past have not been effective, as the mite is protected from any contact pesticide application once the leaf blade curls. Viable management options for the wheat curl mite include, controlling volunteer wheat and weeds at least 2 weeks prior to planting, plating late as possible, and selecting a variety that has resistance to the wheat curl mite. Varieties with resistance to the wheat curl mite do exist, but most of these varieties are not adapted to be grown in our environment.

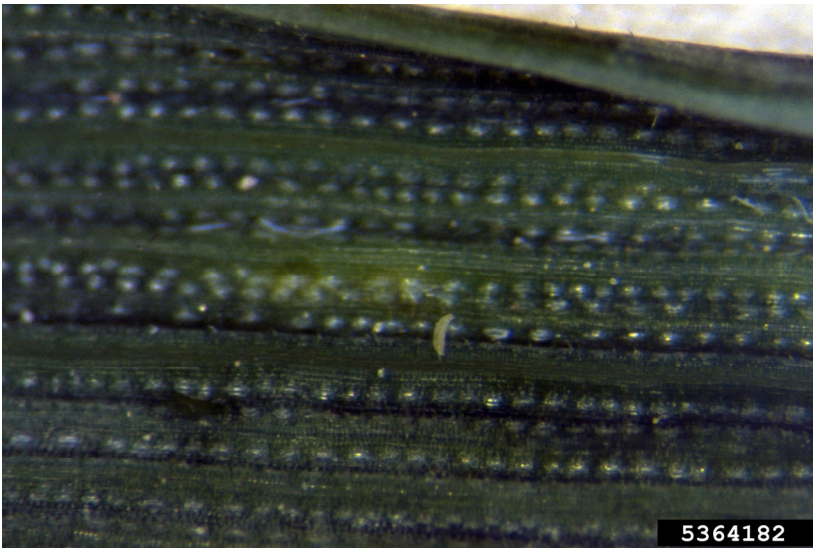


Figure 4. wheat curl mite inside a curled wheat leaf. Photo credit: Frank Peairs, Colorado State University, Bugwood.org

COTTON:

Cotton is starting to emerge around the county, and there are a few things we need to watch as the crop is starting to develop hopefully excellent stands. The first thing we need to keep an eye on is stand establishment and stand uniformity. On cotton planted on 30-inch row spacings, I personally do not mind fields have as low as 25,000 plants per acre (1.4 seeds per foot) if the stand is uniform and does not have any big skips. Secondly, we need to keep an eye out for thrips, as plants can be damaged by thrips in both excessively wet and dry conditions. I wish I had a crystal ball and could predict whether thrips will be a major issue for our cotton crop this year, but the warm dry weather can favor quick cotton growth, and the fact that our small grain crop still has a few weeks before starting to dry down can reduce the risk of thrips damage. On the downside our abnormally dry weather pattern can also favor thrips issues, as wild host near field edges are not lush, and they will be looking for green tender tissue to feed on right as our cotton crop is starting to get established.

There is still room for more cotton acres in the scouting program for the 2022 growing season. If you would like to sign up some fields for the scouting program, please contact me by calling the office or emailing me.

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Blacklands IPM Update



GENERAL:

The area wide soaking we have been hoping for, finally arrived earlier this week. The recent rains will help wheat finish out the crop and keep the corn and cotton crops growing. Rust in wheat is picking up across the area after the recent rains and will likely continue to spread for the next few days. The corn crop is growing nicely given the weather pattern we have been in, but the looking at the bright side of low spring rains is it caused the roots of the plant to dig deep into the soil for moisture. These deep-rooted corn plants will be less susceptible to moisture stress later this summer as they can access what deep soil moisture we have and may build up in the coming months. Cotton planting has wrapped up, but a few people are still replanting some fields that did not emerge very well. Emergence issues are evident in just about every field I have looked at, but some are worse than other, and it appears to be more soil moisture issue than variety. Thankfully, insect pest issues at this time are not a major concern but we do need to keep our eyes on the thrips populations, aphids, and spider mites which I can find in every field I have scouted. Weeds are starting to emerge following the recent rain event, and the next few days will be the optimal time for herbicide applications, so you can treat the weeds before they get too tall and hard to control

WHEAT:

Wheat across the area looks good giving the year, and the recent rain event is probably all the crop needs to finish out to harvest. Leaf rust is becoming an issue following the rain showers Sunday night into Monday morning, and with rain chances this weekend we could see leaf rust continue to spread if fields are not treated. We are getting to the point in the growing season where fungicides are no longer labeled for application based on the crop’s growth stage and the amount of yield loss from leaf rust is minimal due to the growth stage. Most of the wheat I am looking at was in the soft dough stage this week and will likely be in the hard kernel stage within the next 10 days. Yield loss from leaf rust is dependent on the percent of the flag leaf infected and the growth stage. When wheat is in the soft dough stage yields can be reduced by 1 percent for every 10 percent of the flag leaf infected, so if roughly 70% of the flag leaf is infected with leaf rust at the soft dough stage there will be about a 7% yield loss (**Table 1**). If wheat has not reached the soft dough stage, it may be beneficial to evaluate and treat with a fungicide if leaf rust is likely to infect the flag leaf.

Table 1. Approximate percent yield loss caused by leaf rust based on crop growth stage and disease severity

Disease Severity (% of flag leaf diseased)	Growth stage			
	Flowering	Milk	Soft Dough	Hard Dough
10	10	2	1	1
25	15	5	3	1
40	20	8	4	1
65	30	14	7	3
100	35	20	10	5

Insect pest at this time is low, but I am finding some stink bugs and grasshoppers in area wheat fields that should continue to be monitored. Stink bugs are feeding on the developing heads, and can lead to decreased kernel weights. The economic threshold for stinkbugs in wheat is not set in stone, but it is recommended to spray when there is 1 stinkbug in 10 heads from flowering through the milk stage and when there are 3 stinkbugs in 10 heads from the dough stage to the hard kernel stage. Grasshoppers are also present in some area fields but are not causing anywhere near the amount of damage that would justify treatment.

COTTON:

Cotton is up and growing and off to a good stage for the weather pattern we were in leading up to planting time. There are some emergence issues as you move west and south in the area, which did not receive as much rain as areas east of I-35 and North of Hillsboro before planting cotton. The recent rains should help those seeds that are still viable to emerge, but I know some fields that have emergence issues that have been planted for three weeks now and seed viability is becoming a big concern. If you have poor stands, I would wait until probably Tuesday to start evaluating your stands, as this will give those seeds plenty of time to emerge if they are still viable. When evaluating stands you want to look at both the number of plants per acre and the uniformity of the stand in hopes of having skips no bigger than 1.5 feet between plants.

Insect pest at this time is present, but below the economic threshold. During scouting this week, I was finding thrips, aphids, and spider mites in all scouting program fields at levels below their respective economic thresholds. Thrips (**Figure 1**) are averaging less than 1 thrips per true leaf, and most of the thrips I am seeing are adults indicating that our insecticide seed treatments are still working. However, these insecticide seed treatments start playing out as you get to the 2 to 3 true leaf stage. Our thrips populations so far this year, have not been as bad as recent years and there are two reasons that they are not bad right now 1) our wheat is maturing later than normal, and thrips are not migrating out of area wheat fields yet, and 2) the number of wildflowers in roadside ditches are attractive to a lot of our western flower thrips currently. As these flowers start dying off or we start mowing roadside ditches they will quickly move into cotton fields to feed on the young tender tissue. Walking fields and just looking at the plants it looks like there could be a lot of thrips damage, but it is the leaves being damaged by our high winds. If we do get into a situation where we need to start spraying for thrips, they are easy to manage and there are several chemicals on the market that we recommend including acephate, Bidrin, spinetoram, and dimethoate if you can find it.



Figure 1. Adult thrips, commonly found feeding on young cotton plants. Photo credit: David Kerns, Texas A&M AgriLife Extension

Aphids are present in area cotton fields, but are currently well below the economic threshold, and our beneficial insects have not moved into our area cotton fields yet. Seeing low populations of aphid early in the year is not a bad thing as these aphid populations will attract our beneficial insects into the field. As input prices stay elevated, I would highly recommend preserving the beneficial insect population as much as possible to help keep other insect pests low. Spider mites are also present in area cotton fields, but currently are not that bad enough to spray. It is not uncommon to see spider mites on seedling cotton, especially when our weather around emergence is dry and warm. Most of the spider mite colonies I am finding are on the cotyledon leaves, that will soon be desiccating and fall off the plant. At this point in the season, we want to focus on keeping the true leaves as healthy as possible, so the plant can produce enough carbohydrates to set and retain squares early as possible. The economic threshold for spider mites is 40% of plants with noticeable leaf damage and the colonies are growing. Hopefully, we can get some more moisture in over the weekend which will have a negative impact on the growth of spider mite colonies.



Figure 2. Cotton Aphid. Photo credit: Kate Crumley, Texas A&M AgriLife Extension Service



Figure 3. Spider mites on cotton leaf. Photo credit: Kate Crumley, Texas A&M AgriLife Extension Service.

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Authors:
Tyler Mays, Extension Agent-IPM Hill & McLennan Counties
Zach Davis, County Extension Agent-AG/NR

126 South Covington Street
P.O. Box 318
Hillsboro, Texas 76645
Phone: 254-582-4022
Fax: 254-582-4021
Mobile: 979-482-0111
Email: Tyler.mays@ag.tamu.edu

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Blacklands IPM Update



GENERAL:

Another good area wide rain event came this week and brought as much as 3” to parts of the area. Prior to the rain insect activity in cotton was starting to increase as I was starting to find fields at the economic threshold for either thrips or spider mites. While the moisture was needed, the amount of rain received may slow crop development down until we get the warm weather this coming week. The area wheat crop may see some lodging, especially in fields that were heavily infested with Hessian fly, but most of the wheat in the area I have checked is not far enough along to cause premature sprouting or even reduced kernel weights. Cotton in the area ranges from just replanted to as far along as 4 true leaf stage with a handful of fields running over one thrips per true leaf, and a couple of fields with over 40 percent of plants infested with spider mites. The area corn crop really needed the moisture from the rain and is progressing nicely given the dryer weather pattern over the last 6 months. The rain will be beneficial to the corn crop as most of the corn in the area I have seen is at the point where ear size, kernel rows, and the number of kernels per row are being determined.

WHEAT:

Our wheat crop is maturing rapidly, and harvest operations will probably begin being in about 3 weeks. Rust has picked up in the area with recent rains and warmer temperatures, but our crop is past the point you can apply a fungicide to the crop. The recent rains will help finish the later maturing crop and have a minimal impact on the wheat that is a little more mature. One issue that could arise following this rain is lodging, particularly in fields planted with varieties with a weak stalk or fields that were heavily infested with hessian fly. Most of the fields I have check so far have not dried down enough to see issues with sprouting in the head or reduced bushel weight from kernel swelling and shrinking. Hopefully, we can get some favorable weather in the area between now and harvest to avoid the issues we saw with last years wheat harvest.

COTTON:

The area cotton crop is doing well with some fields being replanted. Our crop ranges from just emerging to as las as the 3-4 true leaf stage. Insect issues have picked up over the last week. Thrips populations are starting to increase, and currently averaging between 0.3 and 1.6 thrips per true leaf. Thrips need to be closely monitored because their damage can delay square initiation in and crop maturity (**Figure 1 & 2**). Most of the fields that are near the economic threshold are either at the 2 true leaf stage, or the seed had a base seed treatment and did not receive and in-furrow insecticide application. Thrips are not hard to control, but spray coverage is key since the plants are small. There are a handful of insecticides recommended including acephate (Orthene and generics), Bidrin, spinetoram (Radiant/Intrepid Edge), and dimethoate. I was recently notified those supplies of both acephate and dimethoate are tight at this time, and we may need to start looking at other insecticides like Bidrin or a spinetoram product. Bidrin is not my go to insecticide for thrips, because we are limited on the amount we can apply, and I would much rather keep Bidrin for aphids or stinkbugs later in the season.



Figure 1. Thrips feeding damage in cotton. Photo credit: John C. French Sr., Retired, Universities: Auburn, GA, Clemson, and U of MO, Bugwood.org



Figure 2. Adult thrips, commonly found feeding on young cotton plants. Photo credit: David Kerns, Texas A&M AgriLife Extension

With the recent rains, weeds will likely start emerging across the area. As we start spraying for weeds. For those that planted Phytogen cotton this year, remember that there are counties in the Texas Blacklands where Enlist One and Enlist Duo cannot be applied at this time. I asked Matt Matocha, Extension Program Specialist for the Southern Blacklands to put together some information about early season weed control in cotton. The following is what he put together. There are a number of options growers can use to manage weeds in the early season. If you know your fields history, and that you indeed have glyphosate (or Roundup resistant weeds) then you may also choose to plant one of the newer technologies available in cotton in order to better manage these resistant weeds. The two synthetic auxin technologies, Enlist(2,4-D) and XtendFlex (dicamba), when used properly can allow a farmer to manage glyphosate resistant weeds effectively. These products are also tolerant to both Roundup (glyphosate) and Liberty to allow flexibility when deciding which would be better to use given field conditions, weed species and density. It is always important to remember that Roundup is more forgiving than Liberty when it comes to weed sizes at application. It is best to target 3" or less when using Liberty so that you ensure getting good coverage and control. It is also important to remember that if you know you have at least some of your broadleaf weeds in your field(s) that survive an application of glyphosate, you must then decide what is your best option after that. Depending on the technology you have (Enlist or XtendFlex), you need to plan to begin spraying when the weeds are small so that, ideally, you can cover your acres before they get any larger than 3-4 inch. It is also always a good idea to rotate chemistries, ie, Enlist or XtendFlex first, followed by a Liberty shot, and vice a versa. In addition, when you plan either an early post or mid-post application to cotton, you really should consider using a residual or preemerge tank mix partner so that you can extend your residual control of both grassy and broadleaf weeds until your crop can get some size and begin to shade out at least some of the future weeds that may or may not come up. This "Post" tank mix partner is a good idea so that you may have overlapping residuals since you have applied a preemergence application. Just remember, you must include a knockdown herbicide in tank mix with any residual herbicide. Be sure to follow all product labels and restrictions with the suggestions below as this table is a brief synopsis of such products.

Product	Component(s)	Rate/acre per appl.	Timing	Number of App.'s
Sequence	Glyphosate + S-metolachlor	3.5 pt	PRE/POST	2 shots
Dual Magnum	S-metolachlor	1 pt	POST	1 shot
Tavium	Dicamba + S-metolachlor	3.53 pt	PRE/POST	2 shots
Warrant	Acetochlor	3 pts	PRE/POST	2 shots
Outlook	Dimethenamid	10 to 14 oz	PRE/POST	Max of 21 oz
Prowl H2O	Pendimethalin	1 to 2 pts	PRE/POST	POST – between 4 and 8 leaf cotton
Roundup PowerMax 3	Glyphosate	30 oz	PRE/POST	Total 3.75 qts from all in crop through harvest
Generic – Glyphosate	Glyphosate	Multiple	PRE/POST	Refer to label
XtendiMax*	Dicamba	22 oz max	PRE/POST	Preplant/PRE – 44 oz total In crop –44 oz total
Engenia**	Dicamba	12.8 oz	PRE/POST	PRE/PREplant 12.8 oz In crop 12.8 (25.8 oz total)
Enlist DUO***	Glyphosate + 2,4-D choline	76 oz	PRE/POST	PRE – max 76 oz POST – Two max 76 oz apps
Enlist One****	2,4-D choline	2 pts	PRE/POST	PRE – max 2 pts POST – max 2 appl.
Liberty	Glufosinate	32 oz	PRE/POST	PRE/POST – 29 to 43 oz, max of 87 oz/yr

Aphids were still present in area cotton fields prior to the rain with colonies growing, but still well below the economic threshold. The recent line or storms that moved through on Thursday, likely washed the aphids off the plant, but fields should still be monitored for aphid populations. Spider mites are present in area fields, which is not uncommon. What is shocking is I found a few fields in Southeastern Hill County that was above the economic threshold for spider mites (**Figure 3**). Much like the aphids situation, if you had field with spider mite populations growing, they were likely slowed down and even possible eliminated from the field by the recent rains. If you had a field that was seeing spider mite populations growing prior to the rain, I would let the fields dry out a little and get into the field and reevaluate the spider mite population prior to spraying.



Figure 3. Spider mites infesting cotton leaf.
Photo credit: Tyler Mays, Texas A&M
AgriLife Extension Service

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Authors:
Tyler Mays, Extension Agent-IPM Hill & McLennan Counties
Zach Davis, County Extension Agent-AG/NR

126 South Covington Street
P.O. Box 318
Hillsboro, Texas 76645
Phone: 254-582-4022
Fax: 254-582-4021
Mobile: 979-482-0111
Email: Tyler.mays@ag.tamu.edu

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Blacklands IPM Update



GENERAL:

Wheat harvest operations are finally getting started, and hopefully we can get the crop harvested without the premature sprouting like last year. Corn in the area is reaching the latter stages of vegetative growth and entering the reproductive stages, with some fields already having both tassels and silks emerge. The corn crop is reaching the point where water demand is highest and high temperatures can cause some kernels to abort, and the rain in the forecast for this weekend and the early part of next week will be very beneficial to corn yields. The area cotton crop is all over the board, but the majority of the crop is finally squaring and susceptible to fleahopper damage. Replanted cotton that is just emerging or cotton that has not started squaring is still susceptible to thrips damage, but the recent rains and warm temperatures are leading rapid growth and will likely not have a need to be treated. Fleahoppers are starting to move into area cotton fields, but I have not come across a field that has reached the economic threshold yet. Aphids remain present in most fields, but beneficial insects are starting to move into fields to feed on these colonies.

COTTON:

The areas cotton crop ranges anywhere from just emerging from replanting to as far along as pin head squares. In fields that have not started to square we need to continue monitoring for thrips as they can be an economic pest of cotton from emergence up until the field starts setting squares. The warm temperatures will likely lead to these younger cotton fields to not need a thrips treatment, as thrips typically cause the most damage during times of slow cotton growth. We can also adjust the economic threshold for thrips with the warm weather pattern we are in currently. Under cool and/or waterlogged soil conditions cotton growth is slow and the economic threshold for thrips is 1 thrips per true leaf, but when we get favorable growing conditions like we are currently in we can bump the economic threshold up to two thrips per true leaf.

Cotton fleahopper (**Figure 1**) is probably the number one pest for cotton production in the Texas Blacklands and they can quickly reduce fruit set and yield potential. Scouting this week, I have started picking up on fleahoppers moving into some area cotton fields. Currently, I have not found a field that is at or above the economic threshold for fleahoppers, but their numbers can rapidly increase as we start shredding bar ditches and spraying weeds within cotton fields. The economic threshold for cotton fleahopper in cotton is currently at 10-15 fleahoppers per 100 terminals. There are several effective management options for cotton fleahopper including acephate with or without imidacloprid tank mixed, centric, Bidrin, imidacloprid alone, and even Transform. With the warm and dry weather patten we are currently in we need to keep secondary pest in mind when we are making insecticide selections to manage our cotton fleahopper. Pesticide like acephate and Bidrin are hard on beneficial insects and can lead to outbreaks of aphids and spider mites. If your field does have aphids present and needs to be treated for cotton fleahopper some recommended pesticide options include Acephate plus imidacloprid, Centric, Intruder, and Transform. All these insecticide have some activity on cotton aphids, but with acephate, imidacloprid, and centric only suppression of the aphid population should be expected. If spider mites are also present in the field, with about 40% of the plants infested, and we do not get the forecasted rain for the weekend and early part of next week throwing in some abamectin as you go across the field can keep their numbers for exploding. Below are results from a fleahopper efficacy trial conducted in the Brazos Bottom by Dr. David Kerns last year, that may help you in deciding what insecticides to use for fleahopper management (**Figures 2 & 3**). Additionally, over the last two years I have looked to see if there was a reduction in insecticide efficacy for cotton fleahoppers when using a coarse droplet spray tip like required for the application of auxin based herbicides over the top of cotton. The results from these trials indicate that insecticide efficacy is not reduced when using adequate gallons per acre required for those herbicides.



Figure 1. Adult Cotton Fleahopper, photo credit: Salvador Vitanza

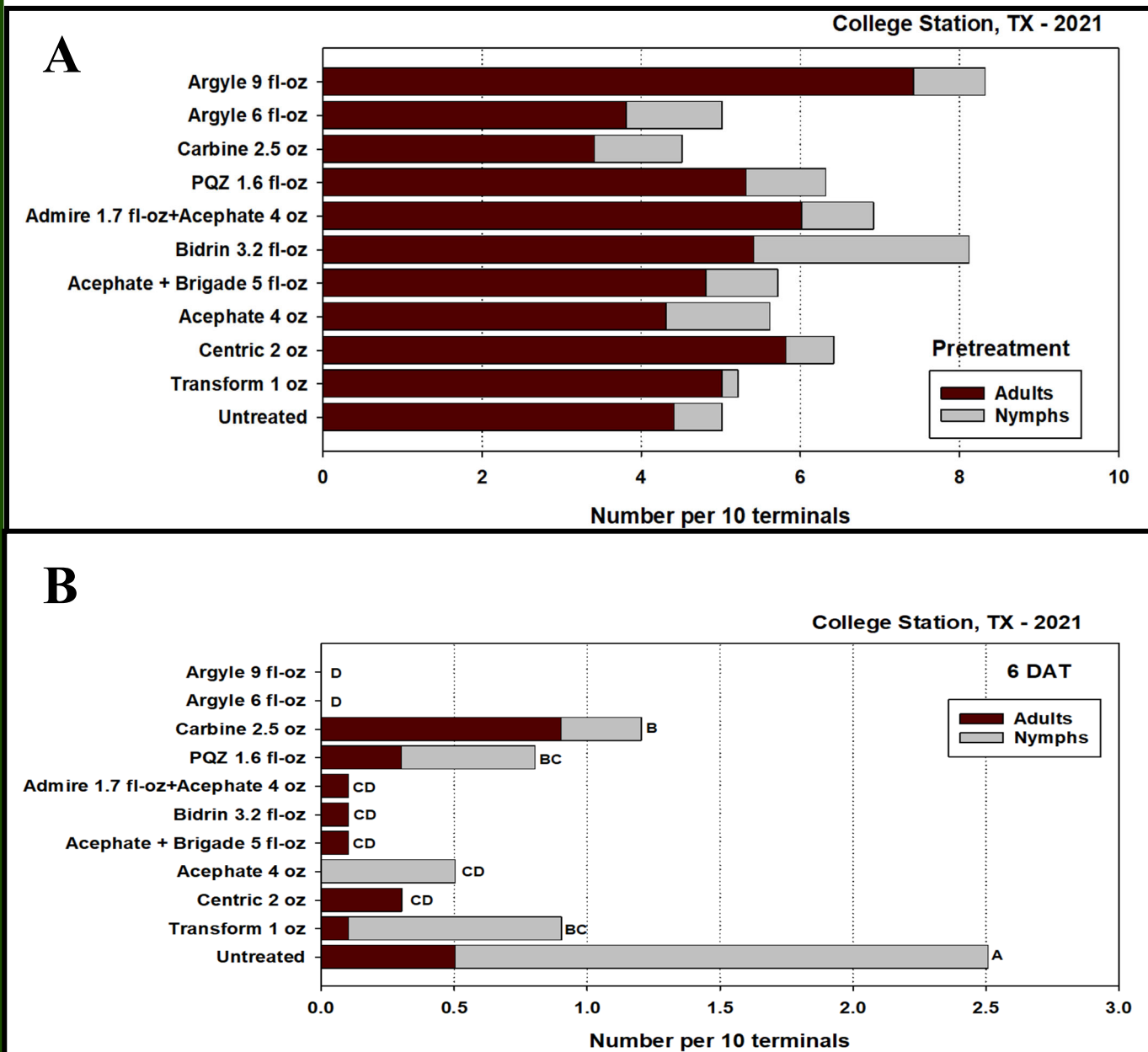


Figure 2. Pretreatment (A) and 6 days after treatment (B) cotton fleahopper counts in an efficacy trial conducted in College Station, TX by Dr. David Kerns.

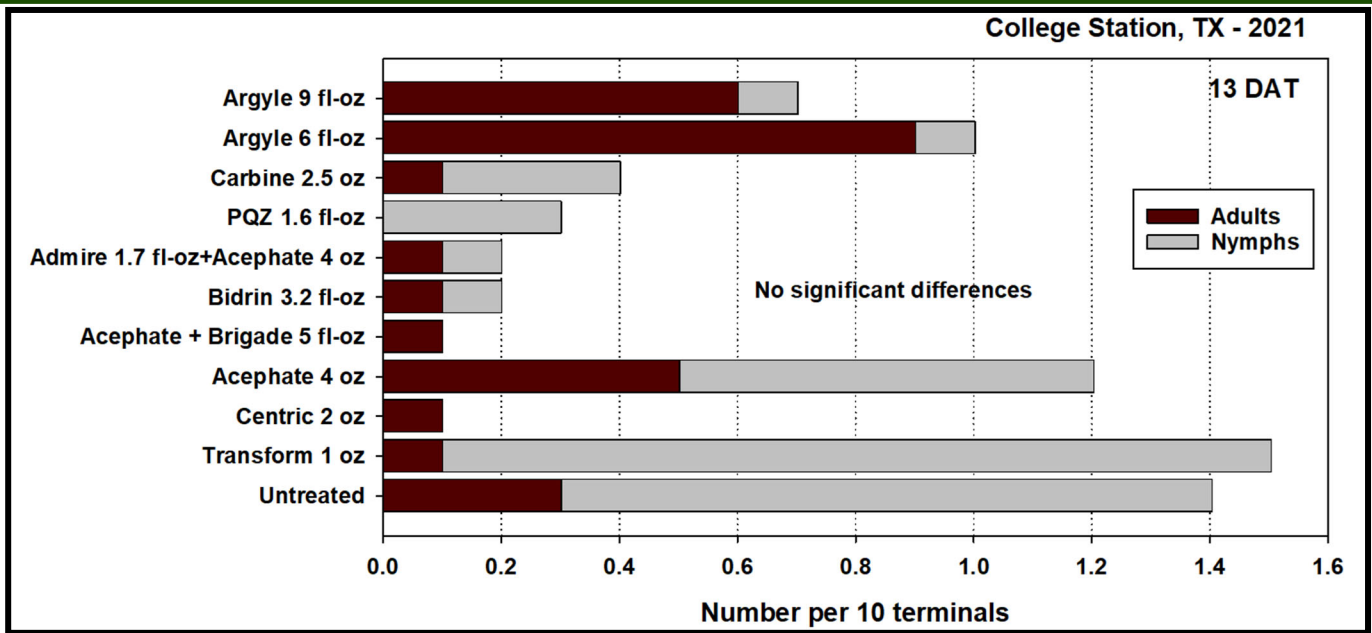


Figure 3. Cotton fleahopper counts at 13 days after treatment in the cotton fleahopper efficacy trial conducted by Dr. David Kerns in College Station, TX

Spider mites are a pest that have been seen in a few area fields already this year in a handful of fields. They are an issue during periods of hot and dry weather like we are currently experiencing. There are a few management situations that can cause spider mite outbreaks, and mainly stem from using insecticides that kill both the target pest and any beneficial insects that can help keep the spider mite populations from increasing. Spider mites feed on the underside of the leaf and can cause the upper leaf surface to develop a reddish appearance where the colony is feeding. In cotton we get the two spotted spider mite that is small and typically tannish in color with two darker spots on either side of the body, but they can at times be reddish in color (**Figure 4**). If we do get an outbreak of spider mites treatment is justified when 40% of the plants are showing signs of feeding with actively growing spider mite populations. There are numerous miticides recommended for managing spider mites including abamectin products like AgriMek and ABBA Ultra, Portal, Oberon and Zeal.



Figure 4. Two-spotted spider mite. Photo credit: Pat Porter, Texas A&M AgriLife Extension Service

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Authors:
 Tyler Mays, Extension Agent-IPM Hill & McLennan Counties
 Zach Davis, County Extension Agent-AG/NR

126 South Covington Street
 P.O. Box 318
 Hillsboro, Texas 76645
 Phone: 254-582-4022
 Fax: 254-582-4021
 Mobile: 979-482-0111
 Email: Tyler.mays@ag.tamu.edu

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Blacklands IPM Update



GENERAL:

Another round of rain halted wheat harvest operations, but was greatly appreciated as the areas corn, cotton, and sorghum acres were getting a little parched. Wheat yield reports are not great but are respectable for the weather we had in the fall and winter. The impact of Hessian fly infestations is starting to be seen as Hessian fly susceptible varieties are yielding less than 40 bushel/acre in most fields. The area's corn crop is just about 100% in the pollination phase, with some fields already in the later part of the blister stage. This last round of rain will greatly help with corn obtaining its potential yield. Most of the cotton in the area is starting to actively square with some of the earliest planted fields already into their second week of squaring. Thrips numbers have been relentless the last few weeks, since our wheat is ready for harvest, and ditches are being shredded or do not have much actively growing plant material. Cotton fleahoppers has moved into area cotton fields that are squaring in high numbers and several fields have been treated this week. Some producers are bailing wheat straw and discussing potentially bailing corn stalks, as due to weather conditions across the state hay supplies will likely be tight later this year. If you are thinking about bailing wheat straw and/or corn stalks, it is highly recommended that you look at the economics of this practice with the amount of nutrients removed per acre and the current prices of fertilizer.

COTTON:

The area's cotton crop is extremely variable with some fields just emerging, to as far along as the second week of squaring. Currently, aphids, fleahoppers, and thrips are causing issues in cotton across the area. The spider mite issues of a few weeks ago have gone away due to rains, beneficial insects, and the most severely infested fields being treated. Aphid populations were starting to grow, but thanks to the recent storms and beneficial insects starting to move into area fields have slowed the growth of the aphid populations. As we continue to scout cotton for thrips and fleahoppers, we need to keep an eye on the development of aphid populations.

Cotton fleahoppers (**Figure 1**) have moved into area cotton fields heavy this week. During scouting earlier this week I was finding fields with fleahopper infestations between 20% and 60% plants infested, and our economic threshold is 10%-15% plants infested. Thankfully, most of the fleahoppers I was finding in cotton this week were adults and had not been in fields long enough for eggs to hatch. Some treatment options for fleahoppers I recommend include a tank mix of acephate at 4 oz/acre and imidacloprid at 2-3 fl oz/acre (depending on formulation), Centric at 1.5 to 2 oz/acre depending on the fleahopper pressure and Transform at 1 oz/acre. All these treatments will provide great control of the cotton fleahopper and provide some level of control of aphids. Another good option for cotton fleahopper management when aphids are present is Sefina at 7 fl oz/acre. This product works good on both fleahoppers and aphids but can be slow to kill the insect even though feeding ceases quickly after exposure. The benefit of Sefina is its residual activity against these insects. Due to the slow knock down of Sefina, it is recommended to tank mix it with 4 oz/acre of acephate, and with this tank mixture you can back Sefina rate down to 3 fl oz/acre and still obtain good residual activity.



Figure 1. Adult cotton fleahopper, photo credit: Salvador Vitanza

BAILING CROP RESIDUES:

It is well known that most of the state of Texas is experiencing some degree of drought, and that hay supplies will likely be tight this fall and winter. During times like these it is not uncommon to see producers bale their crop residues like wheat straw and stalks of both corn and sorghum. With fertilizer prices currently extremely high and showing no promise to drop anytime soon, it is highly recommended to evaluate the economics of the practice between the money made/saved and the cost of replacing the amount of nutrients removed. It is easy to calculate the amount of Nitrogen (N), Phosphorus (P), and Potassium (K) per acre per bushel harvest or ton of silage removed (Table 1). Keeping the crop residue in the field is important in nutrient cycling and the amount of fertilizer needing to be applied to reach your intended yield goal of the next crop. When you leave the crop residue in the field, as it decomposes the nutrients that the plant absorbed during the growing season that was not removed in the grain will become available. For wheat, every bushel of grain removes 1.2 lbs of N, 0.5 lbs of P, and 0.3 lbs of K per acre in the grain, and 0.7 lbs of N, 0.16 lbs of P, and 1.2 lbs of K per acre in the straw. So, a 40 bushel per acre wheat crop will remove roughly 74.5 lbs of N, 25.6 lbs of P, and 60 lbs of K per acre. Corn harvested for grain removes roughly 0.7 lbs of N, 0.4 lbs of P, and 0.31 lbs of K per acre in the grain, and the stalks remove 0.5 lbs of N, 0.2 lbs of P, and 1.1 lbs of K per acre. So, for reference if a field averages 100 bushels per acre, and you bail the corn stalks you are potentially removing roughly 112 lbs of N, 51 lbs of P, and 135 lbs of K per acre. Corn harvested for silage will remove about 10 lbs of N, 3 lbs of P, and 7.3 lbs of K per acre for every ton of silage harvested.

Nutrient	Wheat (per bushel of grain)			Corn (per bushel of grain)			Corn Silage (per ton)
	Grain	Straw	Total	Grain	Stalks	Total	
Nitrogen (N)	1.16	0.70	1.86	0.67	0.45	1.12	9.7
Phosphorus (P)	0.48	0.16	0.64	0.35	0.16	0.51	3.1
Potassium (K)	0.29	1.20	1.49	0.25	1.10	1.35	7.3

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 Tyler Mays, Extension Agent-IPM Hill & McLennan Counties
 Zach Davis, County Extension Agent-AG/NR

126 South Covington Street
 P.O. Box 318
 Hillsboro, Texas 76645
 Phone: 254-582-4022
 Fax: 254-582-4021
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Blacklands IPM Update



GENERAL:

A full week of dry and excessively hot temperatures has taken a toll on the areas corn crop and is not helping the cotton crop as it is trying to set fruit. Corn in the middle of the week was starting to show signs of both high temperature and moisture stress by leaves curling early in the day. Some area corn fields in our lighter soils west of Interstate 35 are having leaves stayed rolled throughout the entire day and not uncurling overnight, indicating that drought and temperatures are really hurting yield. Most of the cotton in the area is in the third week of squaring, but there are a few outliers that either started blooming this week or just started squaring this week. Fleahopper remain an issue in the area but are not very variable across the area with some areas needing to be sprayed again this week. Cotton aphids are also being found in cotton fields around the area but are currently not at a level that would justify treatment. Spider mites have not been found in area cotton since early May, but the current weather pattern could lead to some fields being infested with spider mites that may quickly need treatment. Hopefully, we can get a break from the excessive temperatures and even catch an area wide soaking rain, as if not cotton in the area may start to kick fruit (mainly squares and young bolls) as they start adjusting their fruit load to the limited resources they have. Another impact this hot and dry weather will have on the areas cotton crop is nutrient deficiencies due to low soil moisture in the root zone, not allowing for nutrients to be taken up by the plant.

COTTON:

Cotton around the area was finally to look like a good crop, as a dry and extremely hot weather pattern moved in this week, and the weather forecast does not show any break in this pattern. Insect pest remain active in the area, and scouting should continue for a number of pests to avoid yield loss from an issue that is manageable. Cotton fleahopper (**Figure 1**) numbers are variable across the area, with some fields getting sprayed again for fleahoppers. The good news as in these fields that were treated for the second or third time for fleahoppers the numbers have started to go down. Two weeks ago, I was finding fields that were infested with fleahoppers as high as 60%, and our economic threshold is only 10-15% infested. Going forward once the field starts to bloom, we typically consider the field no longer susceptible to economic loss from fleahoppers. However, if a field enters bloom with less than 75%-80% square set, it is recommended to manage fleahoppers until peak bloom is reached. The fields that are just now coming into the squaring stage due to late planting, or replant situations are at the greatest risk for extreme yield loss from fleahoppers and should be watched closely as our pastures start drying down. Silver leaf nightshade and horsemint are two wild plants that fleahoppers also love to feed on, and as our pastures and ditches start drying down those fleahoppers will be moving and looking for new host. So far this year we are seeing great control of fleahoppers with treatments of acephate at 4 oz plus imidacloprid, Centric at 1.5-2.0 oz acre, acephate at 4 oz plus bifenthrin. Due to the current hot and dry weather pattern I would not recommend the acephate plus bifenthrin shot as this is basically asking for a flare up of aphids and/or spider mites with our current weather conditions. Other treatment options that look good in a local efficacy trial 4 days after treatment include PQZ at 1.6 fl. oz., Transform at 1 oz, and acephate at 4 oz mixed with Sefina at 3 fl. oz.

Aphids (**Figure 2**) are being found in a bunch of fields in the area, and it is a pest we need to keep in mind when treating fields for other insects from this point in the season forward as their number can increase rapidly as fields get stressed from low soil moisture and high temperatures. If we need to treat for fleahoppers it is recommended to at least include imidacloprid with any insecticide that is going to kill the beneficials as it will provide some suppression of the aphid population. Other products that could be used include mixing 3 fluid ounces of Sefina with acephate to manage aphids and provide some residual for fleahoppers, Centric which will provide suppression of aphids, and even Transform. Spider mites are not being found currently in area cotton but could quickly become a widespread issue if we do not get a reprieve from the current weather pattern soon.



Figure 1. Adult cotton fleahopper, photo credit: Salvador Vitanza



Figure 1. Aphids on the underside of a cotton leaf, photo credit: John C. French Sr., Retired, Universities: Auburn, GA, Clemson, and U of MO, Bugwood.org

The hot and dry weather is also reducing our fields yield potential, as under both moisture stress and heat stress the plant will begin to shed fruiting positions. Additionally, the depleting soil moisture conditions will lead some nutrient deficiencies like Potassium that will not be corrected until we get another rain event. Some people may look to foliar feeding to help correct these nutrient deficiencies but going that route can be costly and may not lead to a yield benefit. There are two problems with foliar feeding that can make it costly and potentially not lead to a yield benefit, the first is foliar feeding needs to start before you can visually see the deficiency symptoms, and the second is typical foliar feeding application rates will only provide the plant with enough of a nutrient for a single day of growth. During 2021 I conducted a Foliar Potassium trial where we applied two different foliar K products at various rates applied at peak bloom and saw not benefit from the applications. This may have been from the continued rains late in the season, but the best way to correct a nutrient deficiency is by correcting what is causing the deficiency. For Potassium, the cause is typically dry soils not allowing the plant to take up the Potassium it needs.

CORN:

Corn is in the middle of kernel development with some area fields already reaching the dent stage, but a bulk of the corn in the area is in the dough stage of kernel development. At this time our major pest of concern includes diseases like southern rust, charcoal rot, and Aspergillus ear rot (**Figure 3**) and aflatoxin contamination. Given the weather pattern we had this year Aspergillus ear rot and aflatoxin contamination is likely going to be high this year, especially in fields that were not treated with an atoxigenic product like Afla-Guard or AF-36 Prevail. For those that did apply one of the atoxigenic Aspergillus products, understand that you may still see aflatoxin this year, but their application will reduce the accumulation of aflatoxin in the grain. Some management options we have this late in the growing season include scouting fields for Aspergillus ear rot and harvesting the more severe fields first and as early as possible, and second set up the combine to remove the small light weight kernels that are likely highly contaminated with aflatoxin.

Charcoal rot (**Figure 4**) is not new, and I actually saw some last year in the Malone area. This disease will infect the vascular tissue of the plant and lacerate the tissue within the stalk causing yield loss and reduce stalk strength. Charcoal rot infected plants can be found easily since infected plants will die sooner than those plants within a field that are not infected. When you slice up the stalk from the crown, the vascular tissue will have a grayish-black mass of fungal growth including mycelium and spores, along with very little pith between the xylem and phloem tissues in the stalk. At this point in the growing season, there are no management options to reduce the impact charcoal rot will have on yield.

Southern rust (**Figure 5**) is another late season corn disease that we can see occasionally in the area when we have warm weather. Southern rust creates a round pustule that is orange in color and should not be confused with common leaf rust which forms an elongated pustule that is a dark red in color and does not cause economic yield loss. Thankfully, I have not received any reports of southern rust infections around the coastal bend, Brazos River bottoms, or the southern Blacklands. We do need to keep an eye out for this disease in are corn as it can lead to some significant yield losses, but treatment for the disease is rarely justified after the plants reach the dough stage.



Figure 3. Aspergillus ear rot, photo credit: Gary Munkold, Bugwood.org



Figure 4. Corn stalk showing symptoms of charcoal rot. Photo credit: Gary Munkold,



Figure 5. Rust diseases of corn, left- southern corn rust, and right- common corn rust. Photo credit: Tamra Jackson-Ziems, Bugwood.org

I have been asked by a few producers in the area about spider mites, and much like in cotton there is no doubt that our current weather pattern is perfect for spider mite populations developing in area corn fields. Thankfully, once the field reaches the dent stage, which most of the corn is not far from, spider mites will not cause a significant yield loss. One issue I see with spider mite infestation in area corn this year stem from the crops yield potential, and the cost of control. The products labeled for spider mites in corn are not cheap, and if we have a very optimistic prediction of yield of 90 bushel/acre or less some of these products may not pencil out. If you do have a spider mite infestation in your corn and are wondering if you should treat it will likely be on a field-by-field basis depending on the fields yield potential and growth stage. If one of your fields has spider mites and you are wondering if you should spray, please do not hesitate to contact me or your local AgriLife Extension County Office for help determining to treat the field or leave it alone.

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Authors:
Tyler Mays, Extension Agent-IPM Hill & McLennan Counties
Zach Davis, County Extension Agent-AG/NR

126 South Covington Street
P.O. Box 318
Hillsboro, Texas 76645
Phone: 254-582-4022
Fax: 254-582-4021
Mobile: 979-482-0111
Email: Tyler.mays@ag.tamu.edu

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Blacklands IPM Update



GENERAL:

We finally got a much-needed break from the triple digit temperatures, and some areas even received some rain although it was much less than what is needed. Area crops are starting to show the impact of the prolonged period of triple digit temperatures and no rain. Corn in the area is drying down fast with some areas of corn dying prematurely from either stalk rot or lack of moisture. Cotton across the area is starting to shed fruiting positions as it adjusts its fruit load to the resources it has available. Pest issues in area cotton is relatively quiet currently, but stink bugs and their damage are starting to increase across the area and grasshoppers are starting to move into some area fields. Aphids are present in a handful of fields across the area, but currently they are still below the economic threshold thanks to a decent beneficial insect population.

COTTON:

Cotton has weathered the drought and high temperatures okay, but is finally starting to show some of the impacts including fruit shed and nutrient deficiencies. Pest activity across the area is light thankfully, but there are some pest present that we need to keep our eye on. Current pest issues include stink bugs, grasshoppers, and aphids. Spider mites at this time have not been found in area cotton fields since a few months ago.

Fruit shed is very common in cotton and can be caused by issues such as insect damage, temperature, and soil moisture levels. Currently, most of the fruit shed I have seen is a result of both the drought and high temperatures. Cotton is a perennial plant and does not know that we will be killing it later in the year to harvest the fiber and seed it produced. Due to its perennial growth habit, when faced with stressful growing conditions it will utilize its resources to survive itself and produce only the amount of seed and fiber that it can, which causes the plant to start shedding fruit. Nutrient deficiencies can also lead to fruit shed, as if the plant does not have enough Nitrogen, Phosphorous, or Potassium in the plant to fully develop that boll it will shed that fruiting position. The recent spell of high temperatures can also be blamed for some of the fruit shed, especially the small bolls. The two weeks leading up to a square opening as a flower, is the most susceptible to heat stress. If the temperatures during this time frame averages 86F or higher, it can cause issues with pollen release, size of the boll, number of seeds per ovule/lock. These bolls that are produced from heat stressed squares will stay on the plant, and may be shed from the plant in 3 to 5 days after pollination but could remain on the plant. If the boll is retained on the plant it will have fiber quality issues, and may become misshapen as some locks may not produce seed and lint. Hopefully, we can keep these cooler temperatures and get some beneficial moisture, to hopefully offset the fruit loss.

Grasshoppers are starting to move into area cotton fields, and in most cases are causing damage but not enough at this time to justify treatment. Most of the grasshopper issues I am seeing are on the western side of Hill County, or in fields that are surrounded by pastures that are dried up. Grasshoppers prefer to breed in areas of undisturbed soil like our pastures, and road side ditches. The nymphs are not very mobile as they lack wings for movement, and most grasshopper issues in cotton are caused by adults migrating into the field to eat. Because of it being adults moving into cotton and causing damage it can happen in waves over periods of weeks. Grasshoppers damage cotton by removing the leaf tissue that is needed for the plant to produce energy to grow and produce cotton seeds and fibers, and they can even clip the terminal off from the plant which essentially stops growth of the plant. The sooner you catch the grasshopper migration the less damaging they can be to the crop and typically if they are caught early treating one or two passes along the field margins can be sufficient to limit them from spreading across the entire field. There are a wide range of insecticide available for grasshopper management in cotton including Mustang, Mustang Maxx, Bidrin 8, Baythroid XL, Besiege, Elevest, and Vantacor (formerly Prevathon). While it may be tempting to choose the cheaper products like Mustang Maxx, Baythroid XL, Mustang, and Bidrin 8 it may not be the smartest choice. These products can lead to a second grasshopper application soon, or even cause issues with other pests like aphids and spider mites. The products Besiege, Vantacor, and Elevest will provide residual activity against the grasshopper populations moving into the field, however, both Elevest and Besiege will also kill the beneficial insect population and potentially flare either spider mites or aphids.

Stink bugs and their damage is starting to increase across the area, and some fields in the western portions of Hill County actually had treatable levels of damage (**Figure 1**). Stink bugs pierce the boll to feed on the developing seeds inside. This feeding can lead to boll rots, stained lint, hard lock (lint not fluffing out when boll opens), and potentially boll shed. Stink bugs can have a significant impact on the profitability of a crop because they can impact the amount of lint produced per acre, but they can also reduce the fiber quality which can impact the value of the lint. Currently, I am finding mostly brown stink bugs, but there are a few green stink bugs floating around area cotton fields. It is important to know the type of stink bug brown or green that you have in the field, as our pyrethroid based insecticide options are not as effective against the brown stink bug populations we see in cotton. Treatment for stink bugs is justified when boll sampling indicates that the percentage of bolls with internal damage is at or above the economic threshold for that week of bloom (**Table 1**). Once the crop has accumulated 450 GDD60s past cutout (5 nodes above white flower) treatment for stink bugs is no longer justified. Thankfully, we are accumulating Growing Degree Days quickly and fields may only need to be treated once this year. Insecticides we can use to manage stink bugs in cotton include bifenthrin (Baythroid 2EC), Bidrin 8, zeta-cypermethrin (Mustang and Mustang Maxx), lambda-cyhalothrin (multiple generics), and gamma-cyhalothrin (multiple generics). If you are in a situation where you need to manage stink bugs and grasshoppers at the same time Elevest is a product that will control the stink bugs and grasshoppers and give residual activity against the grasshopper populations that may try to reinfest the field after application. Once treating the field for stink bugs, we need to be very cautious and keep an eye on our aphid and spider mite populations, as these products can flare both pest quickly in our current weather conditions.



Figure 1. Internal feeding damage from stinkbugs shows up as stained lint or like this picture shows wart like growth on the inside of the boll. Photo credit: Ronald Smith, Auburn University, Bugwood.org

Table 1. Economic threshold for stink bugs in cotton

Week of Bloom	% bolls with internal damage	Number of stink bugs per 6 feet of row	Number of stink bugs per drop cloth
1	50	1	1
2	30		
3	10		
4	10		
5	10		
6	20		
7	30		
8	50		

Aphids (**Figure 2**) are present in a handful of fields across Hill County, but at this time there are no fields with enough aphids that would justify an insecticide application. In these fields with the aphids there is a good level of beneficial insects to keep the populations from exploding quickly. However, we are up against a bollworm egg lay event that may move the beneficials from feeding on the aphids to feed on the bollworm eggs and young larvae. Currently the economic threshold is around 50 aphids per true leaf, and hopefully we do not see fields approach this level so we can avoid having to treat for them. If we are going to treat a field for stink bugs that also has aphids in the field, it could be beneficial to include few ounces of an imidacloprid product to suppress the aphids as we kill off the beneficial insects in the field. If we have aphids at the economic threshold within a field the product recommendation would change because imidacloprid is not very effective at controlling aphid populations. Products recommended for aphids that have reached the economic threshold include Sefina, Sivanto, Transform, PQZ, and many others. If you have any questions on if you need to spray, or what to spray to manage aphids please do not hesitate to contact me.



Figure 2. Cotton aphids on entire plant and the underside of a leaf. Photo credit: D. Tyler Mays, Texas A&M AgriLife Extension Service

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Authors:
Tyler Mays, Extension Agent-IPM Hill & McLennan Counties
Zach Davis, County Extension Agent-AG/NR

126 South Covington Street
P.O. Box 318
Hillsboro, Texas 76645
Phone: 254-582-4022
Fax: 254-582-4021
Mobile: 979-482-0111
Email: Tyler.mays@ag.tamu.edu

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GENERAL:

Another week of extreme temperatures and no rain, and at this point it is hard for even the biggest optimist in the area not to feel pessimistic about the area crops. Corn harvest operations have started in the South and Western portions of Hill County this week, and I have not heard any yield reports yet. Cotton fruit shed is continuing at a high rate, and any new squares are quickly falling off the plant, and even young bolls are being shed from the plant shortly after flower closes. What bolls were set on the plants about 2 weeks ago, is what we will have to contribute to cotton yields unless we get some much-needed rain in the area soon. Cotton root rot symptoms are showing up in a few fields, and now is the time to start taking note of where these locations are in your farming operation and within the field. Cotton pest activity is low, but there are some pest activity that warrants scouting operations to continue. This week I started picking up on bollworm damage in two gene Bt trait packages, spider mite moving into field margins, and aphids starting to move to new fields. Stink bugs and grasshopper remain active in some area fields, but populations and damage have not increased much over the last week. Here to a safe corn harvest and more favorable weather soon

COTTON:

While I am typically an optimistic person about a cotton crop, the lack of measurable rain fall and over 10 days of 100+ degree days already this year it is hard to stay optimistic about this crop. Normally, cotton can withstand periods of triple digit temperatures, but we you pair them with depleted soil moisture profiles the plants are not able to combat the adverse weather conditions. This is leading to fruit including squares and small boll from being shed from the crop, and the bolls that somehow luck out and stay on the plant are malformed and/or smaller than normal. The warm temperatures depleting the soil moisture profile is bringing a slough of nutrient deficiency symptoms in area cotton fields, and probably the most prominent of them in the area is Potassium. Potassium deficiency symptoms start as interveinal chlorosis (**Figure 1**) and as the deficiency continues unfixed the leaves will develop a yellowish bronze discoloration. Potassium deficiency is a major issue in cotton as it can lead to issues like fruit loss, defoliation, and it weakens the plants defense system against some foliar diseases. Last year we conducted a foliar Potassium application trial and saw no benefit from making these applications, however, a few days after application the field did receive some rain that may have allow the soil potassium to get back into solution and be absorbed by the plant roots. The best way to correct this deficiency is to fix the cause of the problem which right now is the lack of soil moisture.



Figure 1. Cotton leaf with interveinal chlorosis caused by Potassium deficiency (left) and cotton plants expressing symptoms of Potassium deficiency (right).

Cotton bollworm activity increased over the last week, with eggs still being found this week along with moths still floating around area fields. Currently, it appears that the amount of moths active in fields is very localized with one field having high moth activity and then right down the road moth activity being very light. I did start finding some bollworm damage to small bolls (Figure 2) but I did not find any live worms. This bollworm damage is currently being found in some Bollgard 2 varieties in the area, and it is no surprise to me to see the damage in the fields because of the level of bollworm resistance to the Bt toxin observed over the last couple of years. On top of that our plants are not health and actively growing which is likely cause the concentrations of these Bt toxins to be reduced in the plant tissue. Thankfully, I am seeing a good amount of minute pirate bugs in cotton fields that can help control small bollworms. While scouting this week I did observe that moth laying eggs deeper in the canopy than normal, and are starting to lay eggs on the branches, lower leaves (both upper and under side), bracts, and even white flowers. Continue to monitor fields for bollworm damage, especially those that only have two Bt toxins (Bollgard 2 and TwinLink) as these fields are at the greatest risk for significant damage with some fields already treated in other parts of Central Texas. If we do get into a situation where we think an application may be need, the economic threshold for bollworms is 6% fruit damage with live worms present in the field. Insecticide applications for bollworms should be made as soon as possible since once they get over ½” and start moving deep into the canopy product efficacy can drop off. Recommended products for bollworms are those containing the active ingredient chlorantraniliprole (Prevathon) and these products include Vantacor (former Prevathon), Besiege, and Elevest. If you are in the situation where you need to treat for stink bugs and bollworms at the same time, Elevest would be a good product for this application as it is a premix of Vantacor/Prevathon and bifenthrin. Thankfully, stink bug number and damage has not increased much since last week when a few fields on the western side of Hill County needed treatment.



Figure 2. Small cotton boll with damage from cotton bollworm.

After anticipating spider mites in area cotton fields for the last month, I finally found two fields north of Hillsboro where spider mites were starting to move into field margins. The excessive heat and lack of rain in the 10-day forecast is looking like these spider mite number could soon reach economic levels and justify treatment. The fields where these spider mites were found were along a gravel road that was being frequented by biosolid truck and the wind was blowing the caliche dust into the field margins. For some reason it seems spider mites populations commonly start in or around areas where this caliche dust accumulates on the plant, and it is likely due to reduce beneficial activity in these areas. Spider mites populations can get out of hand quickly, and if not managed in a timely manner can lead to premature defoliation of the crop. The economic threshold for spider mites in cotton is 40% of plants with visual signs of feeding with an actively growing spider mite population. Common miticide products include those containing abamectin (Abba Ultra and Agri-Mek SC), Oberon, Portal and Zeal. The later three of these products are harsher on the beneficial insect and can lead to a resurgence of the spider mites, or even aphids reaching economic levels. If you are treating for bollworms or stinkbugs product selection will have a major impact on if or when you may need to treat for spider mites.

Aphids remain a common occurrence in cotton around the area, and over the last week I started finding them in new fields and moving to more plants in some fields. In fields where aphids are present, they currently are not uniform across the field and currently just a couple of plants heavily infested spread randomly across the field. I have not found a field yet that would justify treatment for aphids yet, and thankfully these pockets of aphids do have some green lacewings and lady beetles helping keep the aphid population from expanding. Currently, the aphid threshold in cotton is around 50 aphids per leaf, but will likely start shifting to 10 aphids per leaf in about 2-3 weeks when we start seeing some cotton bolls open around the area. The reason for the aphid threshold to drop so low once cotton bolls start to open is to avoid sticky cotton issues. If you are seeing a decent aphid population in area cotton fields I would like to conduct an efficacy trial on them, as this is a pest we can see yearly but populations in a normal year usually do not build to levels that are suitable for an efficacy trial.

SORGHUM:

The sorghum I was looking at over the last few weeks was cut over the last 7-10 days for hay, and I no longer have a sorghum field(s) to look at to monitor sorghum aphids (formerly sugarcane aphid). I have received reports of the aphid being present in areas south of Hill and Northern McLennan Counties, and in some of these fields their number have exploded over the last 7-10 days, to levels that justify treatment. As our sorghum acres near harvest the potential for yield loss decreases, but the potential for harvest issues increases, as their honeydew can gum up the combine and slow down harvest efficiency. Continue to monitor area sorghum fields for sorghum aphid populations, and if you have question about treating or what to spray please contact me, as the recommendation will depend on the length of time to harvest and if a desiccant is going to be applied to prepare fields for harvest.

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Authors:
Tyler Mays, Extension Agent-IPM Hill & McLennan Counties
Zach Davis, County Extension Agent-AG/NR

126 South Covington Street
P.O. Box 318
Hillsboro, Texas 76645
Phone: 254-582-4022
Fax: 254-582-4021
Mobile: 979-482-0111
Email: Tyler.mays@ag.tamu.edu

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Blacklands IPM Update



The condition of the cotton crop is continuing to deteriorate as we keep stringing days with triple digit highs together and little to no moisture across the region. There were some pop-up showers received over the last week that brought as much as 0.5 inches of rain, but these amounts were too little too late for the crops in the field and did nothing but halt corn harvest operations. It is getting hard to find things to talk about in these newsletters and out weekly audio updates as the hot and dry conditions continue to negatively impact both the crops and pest activity across the region. However, there are still some insect pests active in area cotton fields including spider mites, aphids, and grasshoppers. Currently, none of these pests have been found at their respective economic threshold but should continue to be watched to avoid more yield loss. Also, this week I started to notice some of our earliest planted cotton starting to open fully mature bolls, and some fields having bolls open prematurely which can have a negative impact on the fiber quality of the lint produced within that boll.

Grasshoppers continued to be found infesting cotton fields. Some of these fields have had grasshoppers for a few weeks now, and some are just starting to have them move into the field. Grasshopper can do a good amount of damage to area cotton, by defoliating the crop and even severing the terminal from the plant. At this point in the growing season with our environmental conditions the biggest issue with grasshoppers is defoliation, as removing the terminals at this point will have little to no effect on the ability of the plant to mature the bolls that will make it to harvest. Excessive defoliation of the crop, however, will reduce the plant's ability to create enough sugars that will be needed to mature what bolls it has set on the plant. This could then lead to fiber quality issues if the plant is not able to fully mature the seed and fiber within the bolls. Treatment for grasshoppers is recommended when they have defoliated approximately 30% of the canopy, and risk defoliating more. There are several products that will effectively manage grasshoppers, but some should be used with caution as they could flare aphids and/or spider mites. Given the current environmental conditions I would recommend either a 0.9 fl. oz shot of Vantacor which will provide about 10 days of residual activity and not flare aphids or spider mites, and another option is 8 fl. Oz. of Bidrin which will not have the residual activity like Vantacor but will not flare the aphid and/or spider mites populations like the labeled pyrethroids would.

Spider mites remain present in the fields they were found in last week, but thankfully, since they were found in the fields two rain events have been received on them which slowed the population development of the spider mites. However, as we continue to have record breaking temperatures in the forecast, spider mites could easily explode in area fields and start defoliating the crop before the plants have had a chance to fully mature the bolls set on the plant. Continue to scout for spider mites, and if you see 40% or more of plants with visible feeding damage and a healthy spider mite population, it is recommended to treat the field to avoid premature defoliation of the crop. There are several miticide products available for spider mite management in cotton, but probably the cheapest option that will give you the most return on investment will be products containing the active ingredient abamectin like Agri-Mek SC, Abba Ultra, and other generics.

Aphids can still be found in area cotton fields, but for some reason they have not exploded into populations that would justify treatment like they have in the Brazos River bottoms. This is likely because the excessive heat and ongoing drought has led to the crop to start wilting and the crop is not healthy enough to support an aphid population. However, as we are nearing the start of bolls opening across the region, we need to keep a close eye on the aphid populations to avoid some issues aphids can cause in cotton. When aphids are present in cotton when bolls start to crack open and expose the lint, the honeydew these aphids produce can land on the lint and cause sticky cotton which can create a nightmare for harvest and ginning operations, and even lead to a decrease in the loan value of cotton bales where sticky cotton is present. The current economic threshold for aphids in cotton is about 60 aphids per leaf, but as soon as we start seeing cotton bolls open that threshold will drop down to only 10 aphids per leaf. Sadly, aphid treatment is not a cheap application as pyrethroids are not effective against cotton aphids, and the recommended products include Sivanto, Transform, and Sefina. Treatment could be avoided if there is a chance for rain that could wash the honeydew from the lint, but the way this season has progressed and looking at some long-term forecast, I would not bank on receiving rain before we start harvesting. If you run into a situation where aphid numbers are reaching the economic threshold and you have questions about what to do or spray, do not hesitate to contact me and we can go over some potential options as treatment decisions will likely be based on a field-by-field basis.

The oddest thing observed in cotton this week is finding some bolls that are opening prematurely. This is not an uncommon condition for cotton as it has been seen in other parts of the cotton belt, but it has not occurred here very often. Talking with Ben McKnight the State Cotton Specialist, this is caused when soil conditions get extremely dry during the later stages of the bolls maturing, and the plant is aborting the seeds within the boll. This will lead to potential fiber quality issues as the fiber produced in these bolls will not fully mature and have a low micronaire and short staple. Talking to others that regularly check cotton, this is being found across the Blacklands, as well as in the Brazos River bottom and Upper Gulf Coast. Premature boll opening can be identified two ways, first when bolls below it are not yet opened (**Figure 1**), and second when inspecting the seeds within the boll, they are not fully developed, and the seed coat has not begun to darken. This is without a doubt a problem brought on by the ongoing drought and prolonged period of excessive heat. I received some pictures from Mark Nemecek this week from where he was taking temperature readings of the plant canopy and the soil surface. On Tuesday afternoon, one of his soil temperature readings reached 169 degrees (**Figure 2**). This is leading to a high rate of evaporation from the soil and makes it hard for roots to uptake water. When plants are not able to absorb water it is not able to properly conduct transpiration which is much like when you and I sweat, and when this is not able to occur it is hard for the plant to regulate canopy temperature. In fields with adequate soil moisture, when ambient temperatures rise to over 100 degrees, canopy temperatures can easily be 20–30-degree cooler, but when plants are unable to transpire properly the plant canopy temperature can easily reach the same temperature as what is read by a thermometer, and another photo Mark sent me show this accurately where the surface of cotton bolls in the upper canopy reached temperatures as high as 122 degrees (**Figure 3**). Thankfully, this premature boll opening is not occurring at a high frequency within fields and may not have a major impact on the fiber quality grades on these fields.



Figure 1. Cotton boll opening up prematurely in the upper canopy, with a boll below it not opened yet.



Figure 2. Temperature of soil surface in Prairie Hill on Tuesday (7/12) afternoon. Photo credit: Mark Nemeec.



Figure 3. Cotton canopy temperature in Prairie Hill on Tuesday (7/12) afternoon. Photo credit: Mark Nemeec

Some of the earliest planted cotton in the areas is starting to have mature bolls opening, and defoliation operations in the area will likely start around the first of August. Given the small canopy most fields have this year defoliating the crop should not be difficult. Harvest aid application selections this year will likely depend on the yield potential for the crop, and I highly recommend conducting boll counts over the next few weeks to determine the fields' yield potential. I would like to issue a little caution when conducting boll counts this year, as bolls this year are smaller than normal, and it will take more bolls to make a bale than usual. In a normal year we use a boll count number of about 10 bolls per row foot on 30-inch cotton to produce 1 bale (12 per row foot for 38" cotton), however, with the size of these bolls it will probably take at least 15 bolls per row foot to make a single bale of cotton. I suspect that our typically 2 fl oz of Ginstar and 2 fl oz of Dropp will still perform good as a defoliation shot but kill shots this year will probably be decided based on a few different factors. Factors that may affect the choice of what to kill cotton with prior to harvest include 1) how well the plant was defoliated, 2) weather forecast, 3) expected yield, and 4) how quickly you want/need to get into the field to strip.

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Authors:
 Tyler Mays, Extension Agent-IPM Hill & McLennan Counties
 Zach Davis, County Extension Agent-AG/NR

126 South Covington Street
 P.O. Box 318
 Hillsboro, Texas 76645
 Phone: 254-582-4022
 Fax: 254-582-4021
 Mobile: 979-482-0111
 Email: Tyler.mays@ag.tamu.edu

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Corn harvest operations are wrapping up for most producers across the area, with yield reports all over the board. Eastern portions of the area that were gracious enough to catch some timely rains had better yields than fields on the western side of the county. In fact I-35 seems to be the dividing line from decent corn to poor corn with corn yields depleting quickly the further west you move of Interstate. Area cotton has progressed rapidly over the last two months thanks to the high temperatures and drought stress and harvest preparations started this week. Cotton defoliation will be full steam ahead starting next week, but thanks to an extended forecast with no favorable chances for rain-fall there is no need to rush to get the cotton defoliated. Thankfully, the drought stressed plants paired with the warm and dry weather pattern will likely make cotton defoliation easier than last year.

Reaching cotton defoliation timing is a big milestone for any growing season, but this one is a little more welcoming as it is a sign that this rough growing season is finally winding down, but thanks to the negative effects of the drought and hot weather potential yields are not bringing much excitement with getting the crop ready for cotton harvest. Timing cotton defoliation is important to maximize both yield and fiber quality during a normal year, but since most of the fruit on the plants were set in a short window defoliation timing is not as difficult as if we had favorable growing conditions leading to an extended bloom period. Additionally, defoliation timing also weighs in the potential adverse weather like rain and heavy dew that can deplete cotton fiber quality, but the current weather forecast does not look like we will have issues this year with rain or heavy dew reducing fiber quality and causing sprouting in the burr.

Harvest aid programs this year will vary between fields based on the predicted yields for the field, and the amount of money left in the budget. Some discussions have already begun on how to get this cotton crop ready for harvest and some producers are looking at trying to get away with a single application. If fields are going to be harvested with pickers, or are not likely to produce over 250 lbs lint/acre I could see where this makes sense. However, for fields that are expected to make over 250 lbs lint/acre I highly recommend using a two shot harvest aid program where you try to defoliate as much of the canopy as possible prior to killing the crop, because of the potential loss in profit by an increase in leaf grade. The base loan value for the 2022 cotton crop is based on the fiber quality being a 41 color, 34 staple, and having a leaf grade of 4, and it \$0.52 per pound. If we keep the same color grade and staple length, but increase the leaf grade to a 7 which is highly likely if you try and one shot cotton that is going to be stripped the loan value drops by over \$0.05/lbs. Hypothetically, if a field yields 300 lbs lint/acre the \$0.05/lbs reduction equates to roughly \$15/acre. There are two shot harvest aid programs that will cost \$15 or less.



Figure 1. Defoliation of cotton at 10 after application of: 1 fl. oz Ginstar, 2 fl oz thiadiazuron, 10 fl oz Finish 6, and 1 pint/100 gallons Non-Ionic Surfactant (NIS).

Cotton defoliation can be tricky at times especially if the crop is healthy and still actively growing which is not the case for the crop this year. Thankfully, this year our area cotton crop is already shutting down and starting to defoliate naturally, and with our hot and dry weather pattern cotton defoliation should not be too complicated this year. Likely the hardest harvest aid decision to be made this year is selecting a harvest aid program that is most economical for the fields potential yield. We did apply a few cotton defoliation treatment to cotton last week on 26 July outside of Abbott. At 8 days after application most of the treatments are working really well, especially program like 1 oz Ginstar plus 2 oz of TDZ(thiadiazuron) with 10 oz Finish 6 and a Non-Ionic Surfactant at 1 pint/100 gallons, and 2 oz Ginstar plus 10 oz Finish 6 with a Non-Ionic Surfactant at 1 pint/100 gallons. The photos below are of the various cotton defoliation treatments at 8 days after application. I personally like the application of 2 oz of Ginstar plus 10 oz Finish 6 with a NIS at 1 pint/100 gallons. Historically, surfactants were not commonly added to the tank during cotton defoliation, but over the last couple of years I have seen that including a NIS to the defoliation mixture helps with breaking the surface tension of the cotton leaf and helping the defoliation chemical getting into the plant. Surfactants like Crop Oil Concentrates and Methylated Seed Oils should not be included as these oil based products can burn the leaves and reduce the efficacy of the defoliation chemicals. Non-Ionic surfactants can also burn leaves and reduce the ability of the defoliation application to defoliate the crop, and to avoid the potential leaf burn I recommend using a NIS at half the normal rate which would be 12.5% v/v which is a rate of 1 pint/100 gallons. This rate will be able to reduce the surface tension of the cotton leaves and allow the chemicals to be absorbed into the leaves. Another issue that needs to be addressed at application timing is spray coverage and application volume. It is recommended to use tips that provide small droplet and apply at rates that will allow for adequate coverage of the canopy even down to the lower canopy. Applications should be made at rates of at least 10 gallons per acre, with 12-15 gallons being recommended to increase coverage.



Figure 2. Cotton defoliation 10 days after the application of: 2 fl oz Ginstar, 10 fl oz Finish 6, and 1 pint/100 gallons NIS



Figure 3. Cotton defoliation 10 days after the application of: 2 fl oz. Ginstar, 2 fl oz. thiadiazuron, 16 fl oz. Prep, and 1 pint/100 gallons NIS



Figure 4. Cotton defoliation 10 days after the application of: 3 fl oz Ginstar, 16 fl oz Prep, and 1 pint/100 gallons NIS



Figure 5. Cotton defoliation 10 days after the application of: 3 fl oz. thiazuron, 16 fl oz. Prep, and 1 pint/100 gallons NIS.



Figure 6. Cotton defoliation 10 days after the application of: 2 fl oz. Ginstar, 1 fl oz. Sharpen, AMS and 0.5% v/v of an MSO.

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Authors:
Tyler Mays, Extension Agent-IPM Hill & McLennan Counties
Zach Davis, County Extension Agent-AG/NR

126 South Covington Street
P.O. Box 318
Hillsboro, Texas 76645
Phone: 254-582-4022
Fax: 254-582-4021
Mobile: 979-482-0111
Email: Tyler.mays@ag.tamu.edu

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Blacklands IPM Update



GENERAL:

Cotton harvest operations are underway in the Texas Blacklands, and like always during cotton harvest we received a much-needed rain across the area. Wheat seed decisions are being made, while most producer likely have already booked their seed for the fall. With Hessian fly being bad across the Blacklands in the past wheat crop I thought now would be a good time to discuss how we can manage Hessian fly in our area. This will most likely be the last newsletter for the year, unless something comes up that needs to be addressed.

HESSIAN FLY MANAGEMENT:

The Hessian fly is a pest of wheat and barley that can cause significant yield losses, especially here in the Texas Blacklands. This past growing season was an example of just how bad Hessian fly infestations can be, and how much of an impact they can have on wheat yields. Hessian fly is a manageable pest of wheat, especially when their pressure during a growing season is not up to biblical proportions like they were this year. This insect pest causes its damage during the larval stage where it feeds on the stem of the plant behind the leaf sheath which provides it protection against any post infection management options. Current recommended management options include variety selection, delayed planting, crop rotation, tillage, and volunteer wheat management, as well as insecticide seed treatments. By using two or more of these management tactics can greatly reduce the impact Hessian fly has on your wheat crop.

Variety selection is probably the most important decision you can make in managing Hessian fly. There are several soft and hard red winter wheat varieties that have some level of tolerance to Hessian fly feeding, or even strong resistance to against them. Varieties that are known to have a high tillering capability tend to have more tolerance to Hessian fly as they are still likely to produce a good number of heads per acre versus a variety that does not tiller very well that has tillers die from being infested. Resistance is based on genes present in the plant; however, these resistance genes can be overcome in two ways. The first way Hessian fly resistant genes can be overcome by a heavy pressure of Hessian fly that overpowers the capabilities of the resistant genes. Secondly, the resistance genes can fail due to a shift in the biotype population. In the United States there are 16 known biotypes, which vary slightly in the genetic makeup. By relying on a single variety, or a group of varieties with the same resistance genes you can shift the biotype population dynamics in the area to one that is resistant to those genes. The table below shows Hessian fly data collected in 2022 from the Hard Red Winter Wheat UVT in Hill County along with the varieties yield, and this data can be used to determine if you want to plant a variety and if other management options are needed. When making variety selections in the Texas Blacklands, and especially for fields with known Hessian fly issues it is recommended to select a variety that has some level of tolerance to the Hessian fly rather than a variety that is resistant to leaf and stripe rust as these diseases can be economically managed with foliar fungicides.

Crop rotation is another management option that is already widely used in the area with many producers rotating in corn and some cotton. By rotating away from wheat for at least 1 year you can greatly reduce the pressure of Hessian fly, by removing the insect's food source. However, these insects are mobile and can move between fields so wheat being planted in fields next to infested wheat stubble may not reduce the population as well as expected. Additionally, by rotating away from wheat for at least 1 year, can also reduce the risk of having issues with other secondary diseases and insects that can survive on the infested/infected crop residue. Tillage can also be used to manage Hessian fly pressures, but this management practice is done after harvest to minimize the issues for the following crop. By tilling infested crop residue, you 1) bury the Hessian fly puparium which makes it hard for the adults to emerge, and 2) you break down the crop residue faster which can help the natural enemies of Hessian fly to help take care of the population faster. Tillage can also be used to manage volunteer wheat that can help the Hessian fly population to start building before the new crop is planted. Because of this ability for volunteer wheat to harbor Hessian fly and other economical insect and disease pests, it is recommended to kill any volunteer wheat at least 14 days prior to planting the new crop.

Planting date can also have a major impact on the severity of Hessian fly damage to you wheat crop. States further north actually have a Hessian fly free date, which is a date that when wheat is planted after it ensures your crop is at a low risk for Hessian fly issues. Sadly, in Texas and much of the southern United States there is not a Hessian fly free date because the fly can be active all year. However, in Texas we can plant later in the fall, say late October into November, and see less issues with Hessian fly during a normal year than if we planted in September or early October. This works by missing the first couple of adult emergence events, and hopefully soon after the crop emerges the weather cools down enough to slow Hessian fly activity.

Insecticide seed treatments are the last line of defense against Hessian fly issues. Seed treatments containing neonicotinoid insecticides like imidacloprid, thiamethoxam, and clothianidin are all labeled to control Hessian fly. Previous research conducted in Georgia indicated that Gaucho could reduce the level of Hessian fly infestation compared to untreated seed. However, this research is over 10 years old, and trials are being planned to evaluate the efficacy of different insecticide seed treatments. If you are planting early, or planting a Hessian fly susceptible variety it is highly recommended to treat the seed with either Cruiser, Gaucho, or Poncho to help control the early season Hessian fly. The one problem with insecticide seed treatments is that they only last in the plant for about 30 days after planting. This is still beneficial as early season infestation have the greatest impact on yield by killing tiller, or even entire plants. Some people have asked me about in season insecticide options, and there are insecticides labeled for Hessian fly management and include insecticides that are harsh on beneficial insects. Currently spraying for Hessian fly is not recommended in our area for two reasons, first the number of applications that would need to be made would not be economical, secondly the repeated application of these insecticides would cause other insect pest like aphids and winter grain mites. Lastly, trying to time these applications just right is difficult, as the pyrethroids do not last long on the plant, especially in moist conditions like we normally see during springs in the Texas Blacklands.

If you are planning on planting some winter grain acres for grazing purposes only, I highly recommend that you look at potentially switching from wheat to oats. Oats are not a host for Hessian fly and will produce more forage if Hessian fly pressure is high during the fall and winter. Additionally, by switching these acres to oats you become a generous neighbor, as your field will not longer be a breeding ground for Hessian fly that will eventually infest neighboring wheat fields. If you are planting winter wheat for dual purposes (forage and grain), then I suggest selecting a variety that is resistant to Hessian fly, along with using an insecticide seed treatment to minimize the impact this pest will have on both forage production and grain production. If your reason for planting winter wheat is solely for grain production, I suggest selecting a variety with at least some tolerance to Hessian fly and planting as late as possible. If you are planting a little early, or in an area known to have high Hessian fly pressure every year I also recommend using an insecticide seed treatment.

Table 1. Hessian infestation levels in various Hard Red Winter Wheat Varieties in 2022 from Hill County, TX.

Variety	Hessian Fly/tiler	% infested tillers
CP1200045#142	9.78	91.67%
TAM 205	6.17	86.67%
TX14A001035	4.37	86.67%
TAM W-101	4.33	88.33%
TAM 304	3.93	75.00%
Big Country	3.72	56.67%
WB4699	3.30	76.67%
TX14M7061	3.22	68.33%
TX14A001249	2.90	80.00%
Bob Dole	2.68	73.33%
WB 4515	2.65	68.33%
TX14V70214	2.52	68.33%
Gallagher	1.50	48.33%
TX15M8024	1.40	41.67%
WB 4416	1.15	51.67%
TX16M9216	1.13	33.33%
AP Roadrunner	1.00	41.67%
WB4523	0.77	33.33%

<i>LSD(p=0.05)</i>	2.17	16.50%
<i>Pr>F</i>	<0.0001	<0.0001
<i>CV</i>	41.69	15.34%

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Authors:
 Tyler Mays, Extension Agent-IPM Hill & McLennan Counties
 Zach Davis, County Extension Agent-AG/NR

126 South Covington Street
 P.O. Box 318
 Hillsboro, Texas 76645
 Phone: 254-582-4022
 Fax: 254-582-4021
 Mobile: 979-482-0111
 Email: Tyler.mays@ag.tamu.edu

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Much of the area has received some much-needed rainfall over the last couple of weeks, with precipitation totals upwards of 3 inches. This has led to decent soil moisture conditions for wheat planting that a lot of producers have taken advantage of, especially from Hillsboro northward. There is a good amount of wheat starting to emerge across the Texas Blacklands, and with these rains and mild temperatures there is a risk for fall armyworm issues to arise.

The fall armyworm is a moth that is known to damage a wide range of crops including wheat, oat, barley, and bermudagrass to name a few. This insect does its damage in the larval stage, which can range in length up to 2 inches when fully grown. The larva of fall armyworm can vary in color from green to brown with stripes running the length of the body that are light and dark. The head of the larvae also have a prominent inverted “Y” on the head capsule, along with four black dots on the last abdominal segment the form a box (**Figure 1**). Monitoring for fall armyworm populations in wheat around these fall rains is important as they can wipe out large patches of young wheat plants trying to get established. Fall armyworms damage the plants by feeding on the leaf tissue, and the significance of the damage ranges from windowpane damage to entire leaves ate from larger worms (**Figure 2**). Larger fall armyworm larvae will cause the most damage and likely have a negative impact on wheat stand establishment. It is highly recommended to scout fields for the presence of fall armyworm and their damage to ensure wheat stands do not suffer. Due to the current drought issues across the region our winter grain crops are at a great risk for seeing issues as these green fields will be very attractive for the moths to visit and lay their eggs. Currently, there is not an established economic threshold for fall armyworm in Texas wheat, and it is recommended to treat when they are present and they threaten establishment of a health wheat stand. Thankfully, there are multiple management options available to for fall armyworms in wheat. Management options include planting later, insecticide seed treatments, and foliar insecticide applications. Unfortunately, there is only one insecticide seed treatment available for wheat that is labeled to manage fall armyworm, which is Lumivia CGL. This seed treatment contains the active ingredient chlorantraniliprole which is the active ingredient as Vantacor (Prevathon). Foliar insecticide options include pyrethroids, Vantacor (Prevathon), Besiege, malathion, and methomyl. The pyrethroids are likely the cheapest foliar insecticide, but the downside to using them is they are easily washed off the plant by rain and dew, and they do not provide a long residual activity. Vantacor and other chlorantraniliprole based products will move into the plant providing residual activity for up to 21 days depending on the application rate. If you planted a Hessian fly susceptible variety or are seeing aphids in wheat fields along with fall armyworm applying Besiege may be the best option as the pyrethroid in Besiege will control the aphids and control any Hessian fly adults or eggs laid on the wheat, while the chlorantraniliprole will control the fall armyworm. The potential for fall armyworm issues in wheat and other winter grains will likely continue for the next couple of weeks until we get a good frost, especially if we keep catching some much-needed fall rains.



Figure 1. Fall army worm larvae (left) and head capsule showing the prominent inverted “Y”. Photo credit: Pat Porter.

Windowpane feeding



Figure 2. Windowpane damage caused by fall armyworm feeding on wheat. Photo credit: Jeff Whitworth and Holly Schwarting, Kansas State University.

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