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Blacklands IPM Update

GENERAL:

Widespread rain has been the story for most of this past week, with areas receiving over 3" of rain. These recent rains and rains from a few weeks ago have led to ponding, flooding, and waterlogged soil conditions in some areas; and could potentially lead to some soil fertility issues. Currently all cotton in the area is susceptible to thrips injury and will remain that way until the field start setting squares. The area corn crop has benefited greatly from this moisture and cooler weather, but this may also lead to further development of northern corn leaf blight.

WATERLOGGED SOILS AND FERTILITY:

Waterlogged soil conditions can cause several issues with soil fertility and plant growth including roots. Soils that are waterlogged lack the oxygen need in the soil profile for the roots to transpire and absorb available nutrients. Additionally, when the soil is waterlogged root growth slows and can lead to a shallow root system which can make the crop more susceptible to drought and heat stress later in the growing season. Waterlogged soil conditions can also increase the plants susceptibility to diseases, as the lack of oxygen in the soil profile can lead to root decay.

Soil nutrients can also be lost during excessive rains and when soil become waterlogged. The most susceptible nutrient to loss during waterlogged conditions is Nitrogen (N), which can be lost through denitrification, leaching, and soil erosion. Leaching is the loss of N to lower portions of the soil profile as water moves through the soil profile and is not very common in soils with heavy clays like we have in this area. Denitrification is the conversion of nitrate and nitrite to gaseous nitrogen through a biochemical process carried out b anaerobic bacteria. The denitrification process can occur rapidly at when the soil is waterlogged and temperatures are between 77°F and 95°F and can be affected by the soil pH. The source of N applied recently may also affect the amount of N lost to denitrification, as both Ammonia and Ammonium are not susceptible to the denitrification process until they go through the nitrification process. Although the rain was greatly needed it could have depleted our soil N in some fields especially in terrace channels and other places that hold water and depending on the crop we may need to thank about applying additional N to ensure we can reach our yield potentials.

Corn requires about 1.2 lbs N/acre for every 1 bushel/acre, and by the VT/R1 growth stage roughly 75% of the total N has been absorbed by the plant. So, for example, a field with a yield potential of 120 bu./acre will require roughly 100 lbs N/acre, and by the VT growth stage will have taken up roughly 75 lbs N/acre, with the need of 25 more lbs N/acre to reach the 120 bu./acre yield goal. With most of the fields in the area still not at the VT growth stage, but quickly approach tasseling, I do not suspect there will be a need for additional N being applied. Cotton on the other hand has not reached the peak demand for N and could possibly benefit from an additional application of N once we start drying out. Cotton requires about 50 lbs N/acre to produce a 1 bale/acre cotton crop, and N demand does not really pick up until the plants start squaring and peaks during peak boll fill. For cotton there is still a lot of time in the growing season where we could correct any soil N deficits and reach our yield goal. It is highly recommended to take soil samples to at least 12 inches, but preferred to a depth of at least 18 inches, and submit them for nutrient analysis. The best response to N applications will occur when they are completed by early squaring, additionally, knifing in N should stop once plans reach the pin head square stage to avoid root clipping. Side dressing N with Y-drops can also benefit the crop by providing additional N to the soil. There are foliar N products out there, but in the long run they may be more costly than knifing or Y-dropping additional N, because of potential for leaf burn and the need for multiple foliar N applications.

CORN:

The corn crop in the area is quickly approaching the VT (tassel emergence) growth stage, and getting close to peak water demand, so these recent rains will be very beneficial to our corn crop. As of right now there are very few issues being observed in the corn fields I have walked through, with just a few fields with low levels of northern corn leaf blight (NCLB). The incidence and severity of NCLB (**Figure 1**) currently varies on the hybrid's susceptibility, previous crop on the field, and tillage practice. Prior to the rains this week, I have not seen any corn fields near the incidence or severity that would warrant a fungicide treatment. These recent rains and temperatures however could help lead to new infections in these fields as well as others in the area. In corn it is important to keep the ear leaf and the leaves above the ear as free of disease as possible to maximize yields, as these leaves are responsible for producing most of the energy the plant needs to fill out the ear. With the recent rains and the forecasted temperatures out to next Friday (May 28) it is highly recommended to keep monitoring your most susceptible hybrids, fields following corn, or with residue on the surface, for the development of northern corn leaf blight. This disease rarely reaches levels that justify treatment, and during 2020 a fungicide trial did not see any yield benefit from the application of fungicides. There may be some fields that are corn behind corn, and with high residue that may need to be sprayed, but fields will need to be monitored to decide if a fungicide is warranted. Below in **Table 1** is a decision aid from Dr. Tom Isakeit, to be used for deciding if a field should be treated with a fungicide. If your field(s) do have levels of NCLB that justify treatment, at the growth stage most of our corn getting close to tasseling, nonionic surfactants (NIS) should not be used as they can cause arrested ear syndrome.

Table 1. Northern corn leaf blight decision aid to determine if fungicide application is warranted in Central Texas.

1) Is the hybrid susceptible to NCLB? E.g. on a scale of 1-10, where 10 is very susceptible, it ranks 8 or higher.
YES—Go to 2
No—No need to spray
2) Was the previous crop corn, and is there residue?
YES—Go to 3
NO—No need to spray
3) Are there lesions on at least 50% of plants
YES—Go to 4
NO—Don't spray be keep checking field
4) Is corn approaching or at tasseling?
YES—Go to 5
NO—Don't spray but check forecast for wet weather
5) Is there rain in forecast?
YES—A preventative fungicide application would be warranted between VT and R1 (flowering)
NO—Don't spray yet, but once crop is past R1, there would be no benefit from fungicide application

Figure 1. Northern corn leaf blight lesion observed in corn on May 13, 2021.

COTTON:

The area cotton crop is between the 2 true leaf and 4 true leaf stage, and most field will soon be out of the window for thrips damage and susceptible to fleahopper injury. Fields once starting to square, typically around the 5th true leaf stage are typically no longer susceptible to thrips damage. Thrips should be treated for when they are averaging 1 thrips per true leaf, for example a field at the 3 true leaf stage averaging 3 thrips per plant should be treated. Fleahoppers will soon be the most important issue to scout for and are pale to grayish green in color (**Figure 2**). The cotton fleahopper feed on young squares, and this feeding cause the bracts of the square to flare out before it is eventually kicked off the plant. The first three weeks of squaring is the most important time to protect the crop from fleahopper damage. The economic threshold for cotton fleahoppers in the Texas Blacklands is 10-15 fleahoppers per 100 terminals.

Figure 2. Adult cotton fleahopper. Photo credit: James Smith, Mississippi State University, Bugwood.org

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