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Blacklands IPM Update

GENERAL:

Triple digit temperatures have set in the area, causing stress on area crops. It has been almost a month since the county has received a good rain, and when you combine this stress with heat stress our late planted cotton field are not only having a hard time growing but also retaining fruiting positions on the plant. As mentioned in the last newsletter, fruit shed in cotton can be caused by several factors including both moisture and temperature stress. Over the last two weeks, Potassium deficiencies have started to show up in area cotton fields, mostly due to the demand for Potassium in the bolls and a reduced uptake of K by the plant. Sugarcane aphid numbers are increasing and to avoid harvest issues, field close to harvest should be check for populations that may need to be treated.

SORGHUM:

Most of the sorghum crop in the area is ready for harvest. Sugarcane aphid numbers are increasing in fields that are ready for harvest and our late planted acres as well. Currently there are a few early planted fields that needed to be sprayed for sugarcane aphids to prevent harvest issues. If you plan on sparing a harvest aid such as glyphosate, and have a decent sugarcane aphid population, mixing in an insecticide like Malathion can kill the aphids before they can move into the head and cause sticky grain issues. Sugarcane aphid populations in out late planted sorghum crops is also increasing thanks to our hot and dry weather over the last few weeks, but populations remain below the economic threshold of 50 aphids per leaf.

COTTON:

The cotton crop in the count is extremely variable with fields on the west side averaging around 50 percent open boll, to fields on the east side of the county still a few weeks away from having open bolls. Once commonality between both side of the count is the onset of Potassium deficiency symptoms. Potassium deficiency symptoms appear as interveinal chlorosis on older leaves, that eventually progress to a red and/or gold coloration of the leaves (**Figure 1**). In cotton prior to bloom these symptoms will be visible on the lower leaves first because the plant is able to translocate Potassium from the older leaves to the newer leaves of the plant. After peak bloom similar deficiency symptoms can appear as well but will appear on the upper third of the plant. In additional to the traditional leaf discolorations caused by Potassium deficiency, after peak bloom leaves may also begin to curl downward and the leaves to become thicker (**Figure 2**). If the Potassium deficiency is severe enough the plants may start to defoliate early, which can cause he deficiency to be confused with the vascular wilt disease called Verticillium wilt. To distinguish between Potassium deficiency and Verticillium wilt, lice the stem and look for vascular discoloration. If the vascular tissue is bright white with no discoloration, then it is most likely Potassium deficiency causing the foliar symptoms and defoliation. If the vascular tissue is discolored it is possibly verticillium wilt, but lab test will need to be conducted to confirm the disease.

Potassium deficiency can be caused by multiple factor that deal with the availability of Potassium in both the soil and plant, the ability of the plant to take up the available Potassium in the soil, and the demand for Potassium in the developing bolls. The availability of Potassium and any soil nutrient is dependent upon soil pH, the form the nutrient is in, and the soil moisture profile. Potassium availability is high when soil pH is near neutral and alkaline (pH>7), but availability does decrease as the soil become more acidic (pH<7). To keep this newsletter short and less complicated the focus here will be the affect of soil moisture on the availability and uptake of Potassium. Both excess soil moisture and deficit soil moisture conditions affect the ability of the plant to uptake Potassium and other nutrients. Excessive soil moisture conditions push oxygen out of the soil pores, making it harder for the soil solution to move into the root system and transported into other parts of the plant. A lack of soil moisture inhibits the uptake of Potassium by there not being enough soil water for Potassium to dissolve into the solution and be taken up by the plant's roots.

Another reason we are seeing Potassium deficiencies, especially in our older cotton is the redistribution of Potassium in the plant. Cotton bolls are strong sinks for Potassium, and as the plant's boll load increases the demand for Potassium in plant increases. When the demand for Potassium in the bolls exceeds the amount of Potassium being taken up from the soil, the plant will move Potassium from the leaves to meet the bolls Potassium demand. This movement of Potassium from the leaves into the bolls leads to the development foliar deficiency symptoms.

Depletion of soil Potassium is another explanation for the development of deficiency symptoms. Soil results in this area typically come back with a high level of potassium, thanks to our soil types. There is the possibility that thanks to our extremely wet spring we could have a shallow root system, that has extinguished its Potassium supply around the roots. Soil samples should be taken every two to three years, to ensure the soil Potassium levels are not being depleted.

There are foliar Potassium products available for cotton, but often time these products are not cost effective because of the amount of Potassium needed by the plant per day, and the amount of Potassium the foliar products provide in each application. Most foliar Potassium products are formulated to provide at most 5 lbs. Potassium. Just because a product is formulated to provide 5 lbs. of Potassium, not all is going to make it into the plant. Not every drop is going to hit and stay on the leaf for it to be absorbed into the leaf, and not every leaf is going to absorb every bit of the Potassium that is on the leaf. Under adequate growing conditions a typical cotton plant uptake between 3 and 4 pounds of Potassium per day, therefore a five pound potassium foliar product will only supply the plant with enough Potassium for just over a day if all 5 pound of the applied Potassium is applied. Therefore the best way to battle Potassium deficiencies is to soil sample every two to three years and apply recommended amounts of Potassium to ensure there is enough Potassium in the soil to supply the crop with enough Potassium for the year to reach the desired yield.

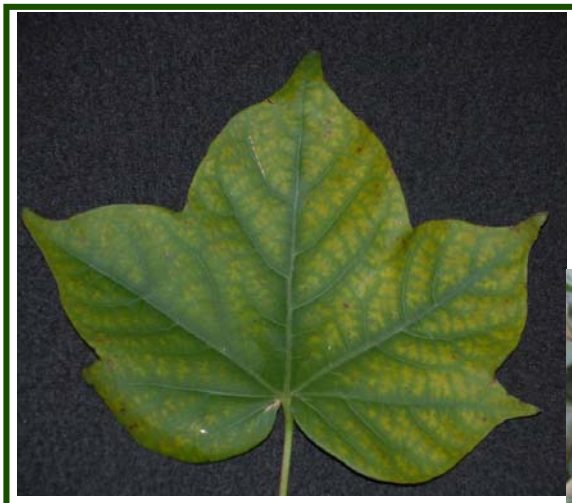

Figure 1. Interveinal chlorosis caused by a Potassium deficiency. Photo Credit: Dr. Darrin Dodds, Mississippi State Univeristy

Figure 2. Development of a reddish gold appearance of the leaf due to a deficiency of Potassium in the plant. Photo Credit: Dr. Darrin Dodds, Mississippi State University

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