Weather related issues on cotton and soybean

Cotton: Darrin Dodds, Extension Cotton Specialist.

Crop Update: Probably to no one's surprise, the most recent National Agriculture Statistics Service report indicates that 99% of the soils in the state have adequate to surplus soil moisture. In the same report, 61% of the cotton in the state is listed as being in good to excellent condition. However, almost daily rainfall in many areas of the state over the past 14 days has lead to many fields with varying degrees of boll rot, hardlock, and seeds sprouting in the boll. In fields infected with boll rot, damage levels range from 10 to 50%. Although rainfall is welcome most times during the growing season, excessive rainfall during harvest is of little to no benefit to the crop and can ultimately be extremely detrimental.

Boll Rot: Looking back through publications Dr. Will McCarty released, it appears that 1984 and 2001 were years that all others are measured by when discussing rainfall and subsequent damage during harvest season. According to these reports, rain fell for 20 consecutive days in the fall of 1984 leading to similar problems that we are seeing this year. Varying degrees of boll rot were observed prior to the heavy rains of the past couple of weeks; however, recent rainfall has exacerbated the problem. The level of damage present will depend on several factors including growth stage of the cotton, canopy density, and rainfall amount. Nearly constant moisture in the understory of the canopy has led to high relative humidity which provides a prime breeding ground for the multitude of diseases that cause boll rot and hardlock. During periods of excessive rainfall, the lower canopy of a cotton field will be warm and moist which will lead to development of disease organisms and subsequent boll rot and hardlock. Infection from these diseases usually occurs along boll suture lines (especially when bolls are beginning to crack) or around insect puncture holes.

Rarely does infection occur directly through the boll wall. Boll rot should be less severe, depending on the level of insect and other damage present, on later planted cotton that does not yet have an open boll.

Hardlock: Hard lock and boll rot are often synonymous with each other; however, it is common to see one phenomena without the presence of the other. Research from the University of Florida indicates that *Fusarium* may be a primary cause of hardlock, although several

other disease organisms may contribute to the problem. Based on this research, the primary mode of infection of this disease is though the flowers. Bolls that are hardlocked do not fluff normally and appear similar to small orange slices. Hardlocked cotton generally will fall to the ground when cotton is picked with spindle harvesters which may in turn lead to yield losses. It appears that fiber quality of these bolls is unaffected.

Seeds Sprouting in the Boll: Not only is excessive rainfall causing problems with boll rot, seed sprouting in the boll is becoming more common in several areas of the state. Seeds sprouting in the boll leads to several problems including ginning problems, reduced seed value, and for those growing cotton for seed, poor seed quality. Once rainfall ceases and bolls begin to dry, sprouting seedlings may die due to lack of moisture.

Defoliation: Making defoliation decisions on cotton that is suffering from boll rot can be difficult. In fields where boll rot is minimal, defoliating when the uppermost harvestable boll is mature (well formed cotyledons, dark seed coats) is recommended. However, once the weather cools to the point that a frost is imminent, defoliants should be applied as soon as possible. Generally, boll openers require 5 to 7 days prior to a frost for maximum effectiveness. Historical weather data indicates that the date with a 50% chance of receiving a frost is October 25 in north Mississippi, November 5, in central Mississippi, and November 10 in south Mississippi. In situations where boll rot is continuing to get worse, defoliating prior to full maturity is an option; however, boll rot may continue to spread and yield and quality losses may be observed. If the seeds still have 'jelly' centers they will not open (immature), if folded cotyledons are present those bolls will most likely open (harvestable), and if there is a dark seed coat present those bolls are mature.

Rainfall is expected through Saturday (September 26) in most areas of the state after which time relatively good weather is predicted for the 7 to 8 days. However, temperatures are predicted to begin cooling on Tuesday of next week. Average daily temperatures below 65˚F will inhibit the activity of thidiazuron and when these temperatures occur, you should begin altering your defoliation programs to match environmental conditions. Thidiazuron + diuron (Ginstar®, Adios®, etc.) does provide somewhat enhanced temperature flexibility compared to thidiazuron alone. However, once cool temperatures set in for good, herbicidal type defoliants such as Def/Folex, Aim, ET, Blizzard, etc. are the primary tools for defoliation.

Defoliation has often been referred to as black magic due to the almost daily differences in crop response to harvest aids, and as such there are many different programs that may be used on your farm. However, if temperatures remain warm (average daily temperature above 65), programs may

consist of 1:60 Drop + 1:24 Def + 1:6 Prep or 1:60 Drop + 1:60 Ginstar + 1:6 Finish. Programs for cooler temperatures may include: 1:8 – 1:10 Def + 1:6 Prep or Finish; 0.75 – 1 oz Aim + 1:6 Prep or Finish. Keep in mind, if a dense canopy is present a two-pass program may be more effective than single-pass programs. Use personal experience as a guide and remember that it is easier to make a second application than to unstick leaves.

Soybean pod splitting and sprouting in the pods

Trey Koger, Soybean Extension Specialist

Week of September 21, 2009: The recent rains have definitely taken a toll on a lot of the soybean crop across the state. With that said, there is a lot of acreage that is ready to cut that still look remarkably good considering what they have been through. As a whole, irrigated acres have taken the weather better than non-irrigated acres unless the field has gone partially or completely under water. In these situations, the damage appears to be quite extensive. Fortunately, the flooding has only been widespread in a few portions of the mid-to north-central delta. Crops within this area of the delta have been damaged extensively with the heavy rains. On a positive note, we still have an extensive amount of acreage (north 1/3 of the state, acreage planted behind flood waters, or in general late planted acreage) that has fared the wet weather well.

We are picking up a lot of pod splitting and seed sprouting in the pods in a lot of fields across the state. This is especially the case where plants are in the late R6 to R7 growth stage and in fields where the crop is either ready to harvest or has been ready to harvest for several days. Even though these pods are relatively easy to find they often account for only a very small percentage (~<0.1%) of the all the pods in the field. With that said, however, the seed in these pods are often rotted or sprouted and on their way to being rotted by time the field is harvested. These rotted seed will either blow out the back of the combine if they are shriveled extensively or have lost a lot of their weight or they will go into the grain tank. These rotted seed and or/or rotted pods will contribute to some level of yield loss that will vary from very slight to extensive depending of course on the level of seed rot and sprouting in the field.

The question has come up whether or not a late fungicide application (R5 to R6) would have helped with preventing or possibly stopping this pod splitting and sprouting inside the pods. Even though some of the data we have collected in recent weeks is showing remarkable preservation of seed quality related to control of phomopsis seed decay, these late fungicide application aren't helpful on preventing pod splitting and seed sprouting in the pods. There are really no options to prevent or slow pod splitting and/or sprouting in the pods. It is a function of adverse weather, a lot of adverse weather in the case of the past two weeks, coming when soybeans are reaching maturity leaving them vulnerable to these types of seed rot / sprouting issues.

This is not the first year we have seen pod splitting and sprouting inside the pod. We saw essentially the same issues in 2001 when we had a similar weather pattern dump excessive amounts of rain across much of the state when much of the soybean crop was in the late reproductive growth stages. Hopefully this weather pattern will blow out of here soon so we can go back to harvesting the extensive amount of crop that was yielding surprisingly well in most places before the rain started. See the pictures below of pod splitting and seed sprouting inside pods.

Sprouting inside the pod on R8 soybean

Pod wall splitting resulting on rotted seed inside pod.

Sprouted seed inside pod resulting in split pod wall.

Sprouted seed in late R6 soybean