

Ag Water Management Considerations in NC for Tropical Storm Debby

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Tropical storm Debby is forecasted to impact North Carolina over the next few days bringing significant precipitation across the state. Figure 1 below shows the rainfall predictions by the National Hurricane Center as of 2:00 pm on 8/06/24.

Rainfall Forecast (from the Weather Prediction Center)

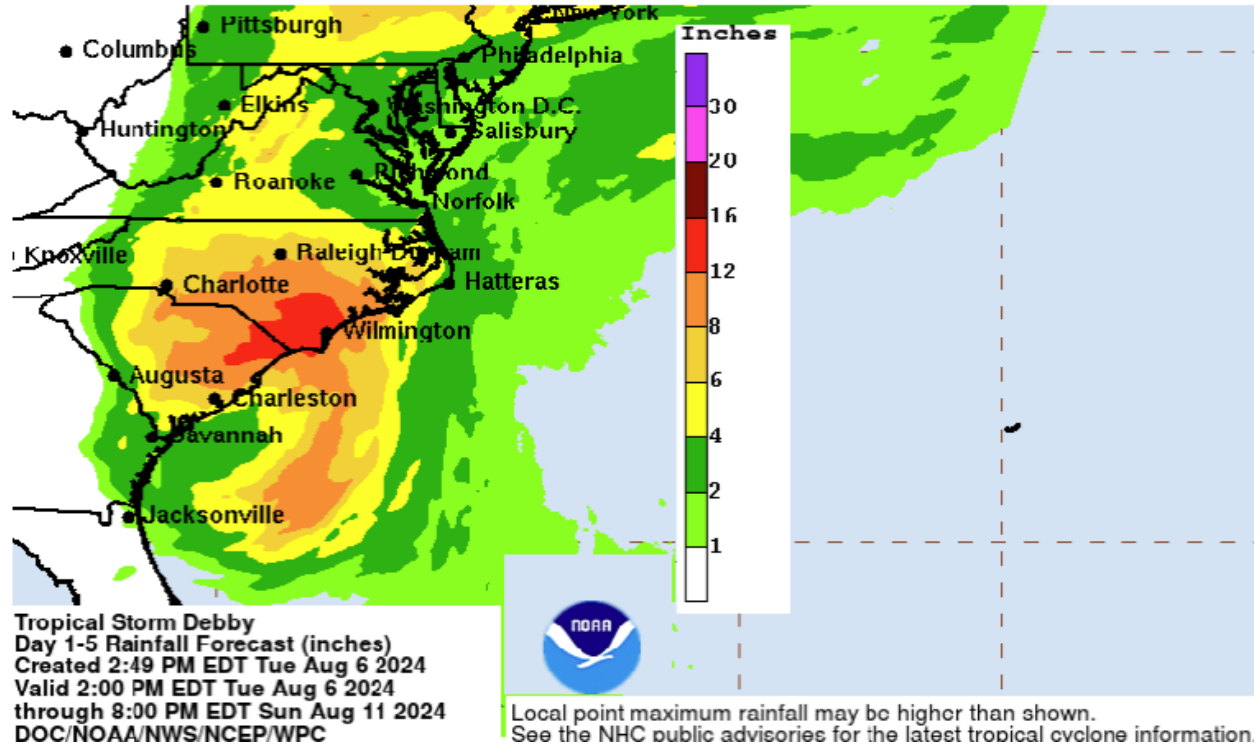


Figure 1. Predicted Rainfall Accumulation During Debby

Most of the state has already received significant rainfall over the last several weeks. Many areas now have a shallow water table, and the topsoil is at field capacity. The statewide soil moisture network in non-irrigated corn currently shows 11 of 12 locations with near saturated conditions in the rooting zone with several showing a shallow water table present within the top 40 inches of the soil profile. This means that we do not have a lot of room in the soil to store water from Debby in the Piedmont and Coastal Plain regions of the state. If the current rainfall predictions hold true this storm will generate significant runoff as soil water storage is limited and the precipitation rate at times will be greater than the infiltration rate of the soil. The potential is high that drainage systems will be overwhelmed and downstream flooding will occur along with significant crop losses due to wet stress conditions.

Protecting Field Crops

Many of our field crops have not reached maturity, so they will be heavily impacted by standing water. It is likely that drainage ways will be backed up and if they are, it will take significant time to relieve ponded conditions in the crop. Crops like tobacco, soybeans, cotton, sweet potatoes, some corn and other specialty crops will be most impacted. Depending on where the farm is located, there are many ways producers can try to minimize field flooding and crop losses as the storm approaches. Producers with water control structures should remove the boards to drain as much water from the fields as possible. Producers should also check tile drains, drainage ways, culverts, and outlets to make sure they are clear of debris that would prevent proper drainage following the storm. For areas that depend on pumping systems, check generators, oil and fuel supplies, belts, bearings, gear boxes and pumps prior to the storm to make sure they will be functional. It is extremely important to maintain intensive drainage prior to and after the storm to relieve water-logged conditions to minimize the impact of flooding on field crops.

Reducing the Effect of Saltwater Intrusion

Some coastal areas will receive 1 to 3' of storm surge as shown in Figure 2 from the National Hurricane Center. Predictions have currently now been made for Northeast NC which will depend on the track of the storm. This storm surge will bring salt water into the lower elevation areas of rural agriculture and silviculture land. This will happen in multiple river basins. Immediate management of the tidal gates, dikes, pumps, and flashboard riser systems in these locations can be utilized to lessen the impact of saltwater intrusion on these areas. On farms that utilize both flash board risers and tide gates for flood control, producers should make sure that tide gates are functioning properly, that seals are in place, and that the gates are not plugged with debris. In cases with flashboard risers and no tide gates, one may want to consider using the riser boards to keep salt water out, allowing freshwater runoff to pond on the upstream side of the structure until the storm surge recedes. At that point, allow the upstream to drain by removing the boards. Low lying areas that are prone to flooding will likely be the most impacted by salt water due to the storm surge. The sooner ponded surface water is removed after the flooding event the lower the accumulation of salt will be.

Peak Storm Surge Forecast



Figure 2. NOAA Predicted Storm Surge During Debby

Reducing Downstream Flooding if Possible

If they have water holding ponds, they should lower the water level by releasing water **NOW**, then as the storm gets near, raise the outlet to maximize water storage during the storm to help reduce the downstream flooding potential. Capturing as much runoff as possible during the storm in irrigation ponds can help to lower the peak flood height downstream. Those that have irrigation reservoirs that are not at capacity can manage them by raising the outlet if possible, to maximize runoff storage to reduce downstream flooding impacts. It will also maximize the amount of irrigation water available later in the season.

Summary

In summary, to minimize impacts of the predicted heavy rainfall to crops, make sure that flashboards are removed from water control structures, tile systems are functioning, and drainage networks are open. Additionally, in areas prone to the effects of storm surge and saltwater intrusion, make sure flood gates are functioning and pumps are operational, ahead of, during, and after this event in all locations that have actively growing crops.