

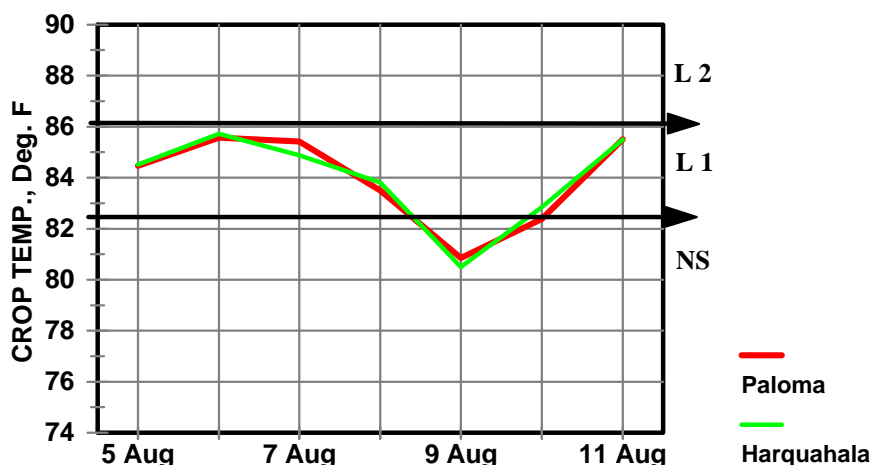
# COTTON HEAT STRESS UPDATE: PALOMA & HARQUAHALA

## 12 August 2001

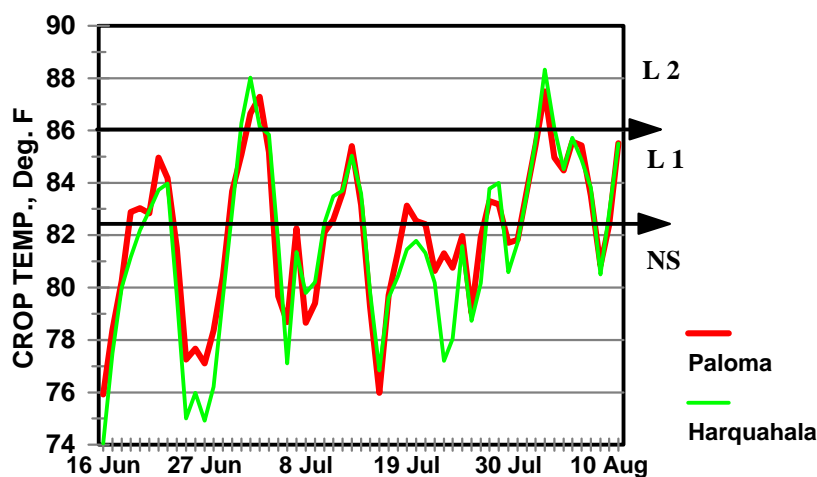
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### Summary

High humidity helped generate 5-6 days of Level 1 heat stress at Paloma and Harquahala. Dew points were quite high last week; fortunately, temperatures remained mild for this time of year and prevented the development of more severe Level 2 stress. Growers should expect to see some shedding of small bolls if their fields remain in the primary bloom cycle. Many fields should be at or near cut-out by now.



**Figure 1. Estimated crop temperatures for Paloma and Harquahala for the past 7 days. Heat stress is normally not a problem when crop temperatures remain below 82.4 °F (zone below bottom arrow labeled NS). Level 1 heat stress results when crop temperatures average 82.4 -86 °F (zone between arrows labeled L1). Level 2 heat stress develops when crop temperature average above 86 °F (zone above top arrow labeled L2).**



**Figure 2. Mean daily crop temperature for the 2001 summer season at Paloma and Harquahala. See Fig. 1 caption for explanation of abbreviations: NS, L1, and L2.**

### **Heat Stress Definitions**

Level 1 heat stress develops when crop temperature averages between 82.4°F and 86°F for the 24-hour day. Periods of Level 1 stress commonly generate light to moderate fruit shed and smaller sized bolls. Fruit shed usually subsides rather quickly when the stress is relieved. The impact of Level 1 stress on cotton reproductive development is often variable. Possible reasons for this variable response include: 1) relative heat tolerance of varieties; 2) field microclimate (e.g. topography and canopy development); 3) crop condition (e.g. fruit retention and crop vigor); and 4) errors associated with estimating crop temperature (representativeness of weather data and errors in model used to estimate crop temperature).

Level 2 heat stress develops when crop temperatures average in excess of 86°F for the 24-hour day. Level 2 stress is the more severe stress and typically produces heavier fruit shed as well as malformed (hooked) and/or smaller bolls. Fruit shed generally subsides once the stress is alleviated, but Level 2 stress also impacts the viability of young (14 days pre-bloom) squares and thus can produce a second, delayed fruit shed nearly two weeks after the stress event ends.