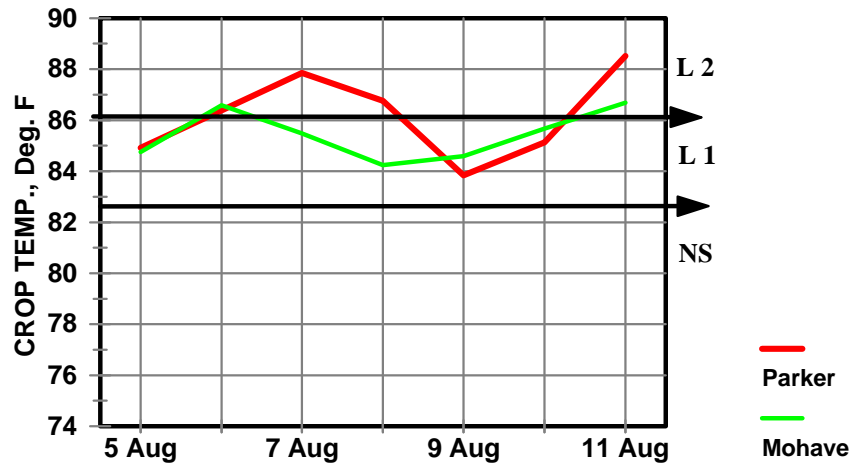


**COTTON HEAT STRESS UPDATE: PARKER & MOHAVE VALLEY**  
**12 August 2001**

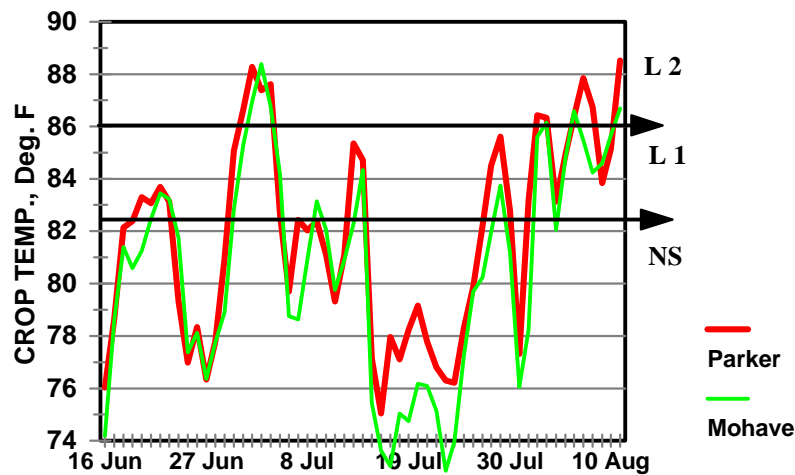
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**Summary**

High temperatures along with high humidity combined to produced a fairly stressful week for cotton in the Parker and Mohave Valleys. Conditions were a little more severe in Parker where Level 2 stress was observed on 4 days. Cooler nights lowered stress levels in Mohave Valley somewhat. Only 2 days of Level 2 stress developed in Mohave Valley. Fortunately, much of the crop is beyond peak bloom, so this stress may not greatly impact fruit retention and yield. .



**Figure 1. Estimated crop temperatures for Parker and Mohave Valley 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 Parker and Mohave Valley. 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.