

# Cotton Field Check

## Heat Units and Late-Season Boll Development Comments -

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**Field Status.** Many SJV cotton fields here in late August are moving along nicely and are well into cutout or progressing rapidly to cutout. However, we also have quite a few fields in several parts of the valley that were subject to early and mid-season lygus infestations and other problems that (a) reduced lower canopy fruit set; and (b) increased the chance of needing a more prolonged later-season fruiting period in order to achieve moderate or better yields. Many growers and PCA's are very successful and sharp in knowing how to achieve good yields after rough early fruiting conditions, but it is worthwhile to also remember some of the limiting conditions late season.

**Maturing Later-Developing Bolls.** In multiple prior evaluations, we have found ranges of degree days or heat units (base 60 degrees F) required to carry fruiting sites from open flower to mature, open boll, and a summary is shown in Table 1.

Table 1. Ranges of heat units (base 60F) required from bloom date to cracked, open boll that can be machine-picked as determined from bloom-date tagged bolls in University of CA studies (1999-2007).

TYPE OF COTTON	Heat Units (base 60F) to Mature Early Season Blooms	Heat Units (base 60F) to Mature Late-Season Blooms
Acala	850 to 1025	800 to 875
Pima	900 to 1050	875 to 975
CA Uplands (thin boll walls)	800 to 950	775 to 850

Table 2 shows long-term (calculated from 1974 through early 2000's data) daily average degree-days (base 60F) and total degree-days (or heat units) for half-month/ two week intervals at Shafter REC in Kern County. This type of data can be used in estimating crop progress under "average" expected weather conditions during July through mid-November. Note that average degree-day accumulations differ with location in the SJV, and can be 5 to 15+% lower in the middle and northern SJV as compared with Shafter REC (Table 2). The primary use of this type of data is just to keep in mind the probability of how many heat units you are likely to have available (on average) for maturing out later-developing bolls. Of course, a long, dry and warm September/October will be above that long-term average and allows your crop to mature out many late-season bolls. The flip side is the chance that a cooler than normal fall might occur and make it even harder to mature late bolls. As usual, growers have to decide on acceptable risks in going after late-season bolls.

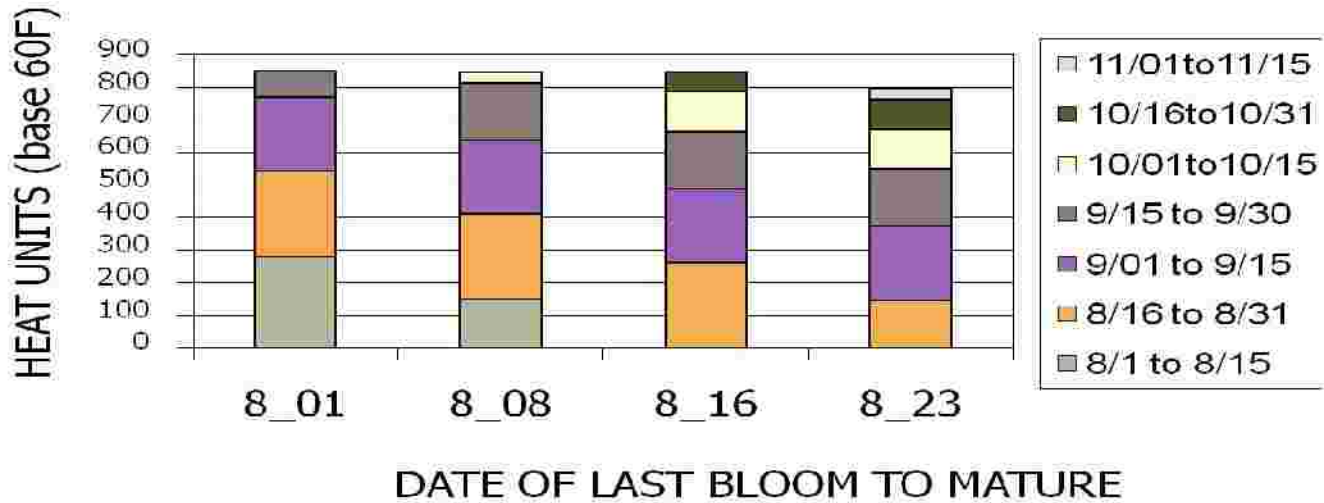
Table 2. Long-term average daily heat units (DD60 = degree days base 60F) at Shafter during specific time periods (averages and ranges determined using 1974 to 2003 data).

TIME PERIOD	DAILY AVERAGE DD60 FOR PERIOD	RANGE IN DAILY AVERAGE ACROSS YEARS (this period)	DD 60F AVERAGE TOTAL FOR ENTIRE PERIOD
July 1 to 15	18.6	14 to 22	278
July 16 to 31	18.8	15 to 23	283
August 1 to 15	18.7	15 to 24	282
August 16 to 31	16.5	11 to 22	263
September 1 to 15	15.3	10 to 22	229
September 16 to 30	11.8	5 to 17	174
October 1 to 15	8.4	5 to 15	125
October 16 to 31	5.6	2 to 9	91
November 1 to 15	2.5	1 to 6	37

**Use of this information if you have or are trying to avoid a late crop.** In a "late" year or for some fields with potential to have later-maturing top crops, we have recommended that growers / consultants work back from desired harvest date to

use the data of Tables 1 and 2 to determine the likely period available for fruit production. Using the information from Table 1, you can assume about 850 degree-days (Acala) and 950 degree-days (Pima) to mature out a mid-to late-season bloom to an open boll. If you add numbers in the right column of Table 2 starting at your desired time for harvest and work back through the earlier periods, you can estimate how long it will take to accumulate degree-days to open that last harvestable flower for which you are “aiming”. A graphical representation of the results of such calculations is shown in Figure 1. The different time periods during which the days are expected to accumulate are represented by the different colored portions of each bar graph. You can see that an August 1<sup>st</sup> bloom will on average accumulate enough heat units by part way through the 9/15 to 9/30 period, while an August 23<sup>rd</sup> bloom will have difficulty on average accumulating 800 heat units by mid-November.

Figure 1. Time periods required to accumulate about 800 to 850 degree days (heat units base 60F) based on (a) long-term average heat unit accumulations at Shafter REC; and (b) calculated for different bloom dates carried out to mature, harvestable bolls. Bloom dates shown range from 8/01 to 8/23.



**FANNOUNCEMENTS – DATES FOR YOUR CALENDAR:**

- September 16 (TUESDAY) - COTTON FIELD DAY (Shafter REC) – contact (661) 746-8037 for details
- September 17 (WEDNESDAY) – SEPTEMBER FIELD DAY (includes cotton, other crops) (West Side REC) – contact Dan Munk for details (559) 456-7561
- Cotton Incorporated State Support Committee Mtg. - Sept. 16 (TUESDAY) starting after lunch in West Conference Room, Shafter REC – contact Bob Hutmacher (cell: (559) 260-8957 for information.