Influence of Boll Age on Boll Shedding Rate

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Summary

Very few bolls shed the first two days after the white bloom stage, but shedding rate then increased rapidly to a peak at 5-6 days after white bloom. The shedding rate then decreased rapidly during the next four days and more slowly thereafter to almost zero at 18 days after the white bloom stage. A severe water deficit can cause bolls to shed that are up to 22 days old, however.

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It has been reported that bolls shed only during the first 2 weeks after anthesis (the white bloom stage). A test was conducted during the summer of 1981 on the Cotton Research Center in Phoenix to determine the shedding rate of bolls of different ages. White blooms were tagged daily during June and July. About 3 weeks after the first blooms were tagged, all shed tags were gathered and discarded. Thereafter, tags of shed bolls were gathered daily and sorted according to date applied (date of white bloom) and date gathered (assumed to be the date the boll shed). Percentages of bolls shed in each age group were then calculated. The numerator was the total number of bolls of a given age that shed during a 20-day period and the denominator was the total number of bolls in that age group (corrected for shedding at an earlier age).

Very few bolls shed the first 2 days after anthesis, but shedding rate then increased rapidly with increasing boll age. The highest shedding rate occurred 5 days after anthesis in normally irrigated plots and 6 days after anthesis in mildly stressed plots. (The data in Figure 1 are combined averages for all plots.) Shedding rate decreased rapidly as bolls became older than 6 days, but then increased slightly to a small second peak at about 12 days after anthesis. It declined slowly thereafter to near 0% shed at 18 days after anthesis.

Although 3 to 10-day-old bolls are the ones that are most likely to shed, older bolls can and do shed. A severe water deficit caused large bolls up to 22 days old to shed, and caused almost 100% shedding of young bolls. In addition, a severe stress slows square production and causes considerable square shedding. Thus, a severe stress not only increases the rate of boll shedding, it also increases the age range of fruiting forms that can be lost (widens the "window"). Therefore, stress can interrupt and delay fruiting (boll setting). The greater the stress the greater will be the interruption.
Figure 1. Changes in boll shedding rate with boll age.