

Cotton Fruit-Shedding – Who’s To Blame



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Fruit shedding can be caused by bugs, disease, nutrient deficiencies, or the environment (as affected by weather or management). Even in the absence of pests and on fields with good fertility, it is common for a cotton plant to shed 60 percent of its squares and young bolls under typical growing conditions. Although fruit shed normally increases dramatically as the crop approaches cut-out, it can occur anytime and even with relatively small changes in the weather. What causes fruit shed and is there anything we can do to prevent it?

Cotton has a tight coupling between the supply of carbohydrates from photosynthesis in the leaves and the demand of carbs for fruit development and boll filling. Whenever the supply does not meet demand, cotton will shed its youngest fruit (young squares and young bolls) to preserve the larger bolls which it has invested more resources into. The problem is that cotton may shed fruit to adapt to environmental conditions (for example, a cloudy day) that may soon improve. It is important to note that fruit shed often occurs a couple days after the stress period but it may take over 3 weeks for the flowering rate to recover. Further, there is often additional fruit shed after the stress is relieved because of an increase in metabolic activity within the plant.

Several factors can cause the supply of carbs to not keep up with the demand from the developing fruit and cause fruit to shed. These include low light, high temperatures, high humidity, and too little or too much soil moisture. Low light can be the result of cloudy/overcast conditions or a high degree of shading within the canopy. Cotton fruit is highly dependent on supply of carbs from the leaves nearest the fruit (subtending leaves). If the population density is too high, row spacing too narrow, or cotton too rank, the lower leaves will not receive enough sunlight and adjacent fruit may shed. High humidity reduces the ability for cotton to cool itself through transpiration and high temperatures increase the use of stored carbs (demand). Excessive soil moisture reduces the amount of oxygen available to the roots which

may cause stomata to close, thereby reducing CO₂ intake for photosynthesis (supply). Rain or irrigation may also cause pollen grains to rupture resulting in poorly pollinated flowers that are often aborted. However, this loss is usually compensated for by increased fruit set.

This has been an unusually wet summer for many of us in W. Tennessee and has been a perfect environment for shed fruit. We have had many cloudy and overcast days, high humidity, and excessive rainfall causing saturated soil and rank cotton. What can we do to reduce fruit shed in the future? Prevent rank growth by timely application of growth regulators (Pix), by not over-applying nitrogen, and by not over-irrigating. Avoid irrigating more than once in five days during bloom to improve pollination (although this may not be practical in dry years). Reduce plant population to increase the amount of sunlight reaching the lower fruiting branches. A lower plant population will likely increase boll size and number of bolls per plant. Δ

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Fruit shed in cotton