

Simulated Hail Damage in Cotton in Arizona

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Introduction

- ❖ Accurate estimations of crop yield loss from hail damage are important for management decisions and adjusting insurance claims after hail storm.
- ❖ Insurance adjusters use a step-by-step procedure from National Crop Insurance Services to assess the effects of hail damage on cotton. The assessment includes estimations of cotton yield reductions by stand loss (plant totally or partially destroyed and main stem growth point lost), by fruiting branch removal, and by boll loss at different growth stages.
- ❖ Current data on the yield loss from hail storm was developed from field experiments in southern states. The information is not applicable to southwestern states such as Arizona and California, in which cotton is grown in a much longer growing season.

Objective: Estimate cotton yield loss by different levels of fruiting branch removal at different growth stages in Arizona.

Materials and Methods

- ❖ Cotton variety '164 B2RF' was planted on 40-inch bed on April 4, 2008 at University of Arizona Maricopa Ag Center at Maricopa, AZ.
- ❖ Cotton fruiting branch removal was conducted at R8 stage (8 fruiting branches), R12 (12 fruiting branches), and R16 (16 fruiting branches, or R16).
- ❖ At each growth stage, five different treatments including 0, 25, 50, 75, or 100% of fruiting branches removal were applied (Table 1). Hail damage was simulated by cutting fruiting branches larger than 1 inch from the top of cotton plants using pruners (Figure 1).
- ❖ The final irrigation was applied on September 2, 2008 and defoliants on September 30, 2008. The field was then harvested on November 10 for seed cotton yield.



Figure 1. Fruiting branch removal

Table 1. The number of fruiting branches removed for each damage level at each stage

Level of fruiting branch removal	R8 Stage (8 Fruiting branches)	R12 Stage (12 Fruiting branches)	R16 Stage (16 Fruiting branches)
0	0	0	0
25%	2	3	4
50%	4	6	8
75%	6	9	12
100%	8	12	16

Results

- ❑ Cotton plants responded to fruiting branch removals by increasing growth and boll setting in other parts of the plant.
- ❑ Yield reduction was related to percentage of fruiting branch removal but not to growth stage at which removal occurred (R8 to R16) in this study (Figure 2).
- ❑ If the main growth point is undamaged during hail storm during the R8 to R16 stage, growers could recover 80% to 100% of their cotton yield under growing conditions in Arizona.
- ❑ Management practices might need to be adjusted after hail damage to increase cotton boll setting on top branches .

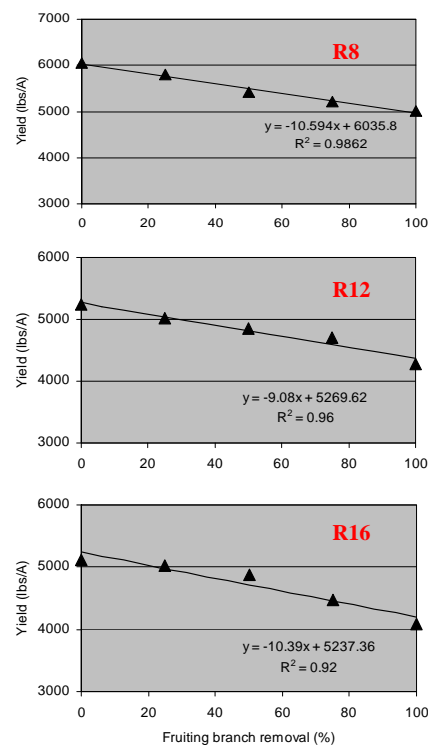


Figure 2. Seed cotton yield loss by hail damage