

Causes of Square Shed

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As late season insect pressures grow, making short season production practices more economically desirable, the necessity for early season square retention becomes paramount. To determine the causes of square shed an experiment was conducted in 1978 at the Cotton Research Center in which shedding squares were dissected and the reason for their abscission determined. Insect populations were monitored.

Four categories of symptoms were observed which led to square shed. 1) Plant bug feeding, 2) soft rot, 3) worm damage, 4) physiological. Soft rot was sometimes associated with Lygus feeding or worm damage. In those instances, the abscission was listed as due to the insect activity. Those assigned to soft rot had no symptoms of Lygus or worm feeding. The proportions of shedding due to the various causes from 6/5 to 8/7 are listed in Table 1.

These data indicate that square shedding in 1978 was not a serious problem from any cause until worm activity began in July. At all dates except 7/10 the shed due to insects and rot exceeded those due to physiological stress. The week of 7/10 followed a period of rain which may have induced physiological shed. The observation that rot is associated with 20-30 percent of abscission prior to mid-July indicates a problem area which needs investigation. No definitive data are available as to the initial causes of this rot.

The plant bug populations were monitored throughout the season. Lygus bugs increased from 0.5 per 50 sweeps on 6/5 to 4 per 50 sweeps on 6/27 and then declined to nil on 7/11 and 7/18. They then built up somewhat to counts of 2 per 50 sweeps on 8/8. A correlation analysis of Lygus counts to squares shed due to Lygus feeding showed a highly significant correlation coefficient ($r=.78p<.01$). If we assume the adjustment used in the literature to convert sweep counts to actual insects present (sweep net assumed to be 20% effective) the rate of feeding per Lygus bug calculates at 1.3 squares per insect per day.

The final yield in this experiment was 1000 lbs. lint per acre. Boll counts in August indicated a potential yield near 1500 lbs. per acre but no pink bollworm control was applied to this field and considerable loss was experienced. The yield reflects that which can be expected from short season practices which minimize square shed during the first eight weeks of squaring.

Table 1. Square shedding in 1978 as caused by plant bugs, soft rot, worms or physiological stresses.

Week beginning	Fraction of available positions shed (%)	Number shed this week/acre	Percent of this week's shed due to?			
			Bugs	Rot	Worms	Physiology
6/5	8	8000	70	21	-	9
6/12	7	12000	68	22	-	10
6/19	15	48000	70	22	-	8
6/26	17	44000	54	28	1	17
7/3	14	20000	65	23	-	12
7/10	16	48000	-	21	-	79
7/17	27	124000	30	4	44	22
7/24	34	144000	30	5	42	23
7/31	34	64000	6	3	50	41
8/7	43	60000	23	2	65	10