# HEIGHTS OF NORMAL AND DEFRUITED COTTON PLANTS IN THREE TALL AND THREE SHORT PIMA GENOTYPES

**K. E. Fry, Plant Physiologist and Carl V. Feaster, Research Agronomist, USDA, Agricultural Research Service**

**Summary**

Fruit load affected plant heights of normally tall and short Pima cotton genotypes differently.

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Some recently developed Pima genotypes tend to be short in stature and may be suitable for narrow-row culture under certain environments. To better understand the phenotypic expression of plant height in these genotypes, three short (P51, P58, and P62) and three tall (P53, P59, and S-6) genotypes were defruited throughout the boll production period, and their heights were compared to those of normally fruited plants. Heights were measured on August 11 and 23, and September 21, 1983.

On 8/11 there were no significant height differences among the three short or three tall genotypes, although between the two groups the tall genotypes averaged 19 percent taller than the short genotypes. At this time, height differences between the normal and defruited plants were not yet noticeable. By 8/23 all defruited plants were significantly taller than the normally fruited plants in both the tall and short genotypes (Table 1). These differences increased by the end of the season. On both 8/23 and 9/21 genotype P62 showed the greatest percentage height difference between the normal and defruited treatments, which was probably caused by an early inhibition of growth in the fruited plants, thus obtaining the shortest genotype. Defruited P62 were nearly as tall as P51 and P58 suggesting that the phenotypic height expression was similar in the three short genotypes when there were no boll-load effects. The height differences from defruiting in the short genotypes increased from 32 percent on 8/23 to 37 percent on 9/21 probably because of an increasing effect of the boll load on the fruited plants as the season progressed.

**Table 1. Percentage increase in height from defruiting plants of Pima cotton on August 23 and September 21, 1983.**

| Genotype | August 23 Heights (cm) | | % | Genotype | September 21 Heights (cm) | | % |
|---|---|---|---|---|---|---|---|
| | Normal | Defruited | Incr. | | Normal | Defruited | Incr. |
| P53 | 115a[1] | 137a | 19 | P53 | 133a | 171a | 29 |
| S-6 | 100bc | 130a | 30 | S-6 | 132a | 165a | 25 |
| P59 | 103ab | 129ab | 25 | P59 | 120ab | 160ab | 33 |
| P51 | 94bc | 118bc | 26 | P58 | 118b | 153bc | 30 |
| P58 | 88cd | 115c | 31 | P51 | 109bc | 148bc | 36 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| P62 | 79d | 112c | 42 | P62 | 99c | 147c | 48 |
| Tall[2] | 106 | 132 | 25 | Tall | 128 | 165 | 29 |
| Short | 87 | 115 | 32 | Short | 109 | 149 | 37 |
| % Diff. | 22 | 15 | | % Diff. | 17 | 11 | |

[1]Values followed by the same letter within each column are not significantly different at P= 0.05 by Duncan's Multiple Range Test.

[2]Tall= average heights of P53, S-6, and P59
Short= average heights of P51, P58, and P62

In the tall genotypes P53 was the tallest in both the normal and defruited treatments with the heights of S-6 and P59 similar. Defruiting had less apparent effect on the tall genotypes, especially by 9/21, because these genotypes accumulate fruit loads more slowly than the short genotypes, resulting in little or no cut-out effects.

Conclusions from these data are (1) phenotypic expression of height in the short genotypes is significantly different from that in the tall genotypes with and without a fruit load, and (2) the short genotypes show a stronger growth inhibition in the presence of a fruitload than do the tall genotypes.