Percentages of Dry Weights in Various Fractions
of Cotton Plants Grown on 224 mg NO_3-N/Plant

	Attached Leaves	Abscised Leaves	Stems	Roots	Squares	Bolls
Deltapine 16	26.5a*	10.0a*	45.5ns†	16.6ns†	0.1ns†	1.3ab*
Acala SJ-4	20.2b	9.0a	44.9	24.9	0	1.0abc
Paymaster 909	24.3a	6.9a	50.0	17.1	0	1.8a
Coker 310	15.3c	16.8b	48.7	18.6	0	0.6bc
Pima S-3	14.6c	15.5b	47.0	22.9	0	0 c
Pima S-5	24.4a	10.6a	43.6	21.4	0	0 c

*Numbers in a column followed by the same letter are not significantly different at the 5% level.
†Not significantly different at the 5% level.

Southeastern U.S., had by far the greatest abscised (shed) leaf fraction and the smallest attached leaf fraction. Paymaster 909, a semideterminate line from the Texas high plains, had the lowest percentage of abscised leaves. Not surprisingly, fruitfulness was greatest in Paymaster 909 and least in Coker 310 (although the amount of N applied, 224 mg, allowed only marginal fruit set). There were no significant differences among cultivars in percentages of stem and root weights. Another way of expressing these results is that Coker 310 was least able to mobilize its N reserves to support either new leaf growth or maintenance of old leaves. A similar relationship was found for the N contents of the fractions. Of the two Pima cultivars tested, S-5 had significantly more attached leaf material and less abscised leaf material than S-3, but neither variety set any bolls under these conditions.

MINI-COMPUTER CONTROLLED DATA ACQUISITION SYSTEM FOR WEATHER AND PLANT PARAMETERS

K.E. Fry

For the cotton season of 1975 a basic data acquisition system was developed to measure and record weather and plant parameters. Eight field stations were located in plots involving three irrigation treatments and two cultivars (Pima S-5 and Deltapine-16). They were operated by a mini-computer located in an air-conditioned trailer. A total of 220 input lines were available. Data were obtained as millivolts, converted to temperature or solar radiation (or not converted), printed on a teletypewriter, and punched on paper tape. The parameters measured were 1) air temperature at various heights in and above the canopy, 2) solar radiation, 3) net radiation, 4) photosynthetic active radiation, 5) dew point temperature, 6) wind run, 7) soil temperature profiles, and 8) leaf temperature. Selected data were sorted later, averaged, and formatted on the same equipment. The computer program in absolute assembler language allowed for 1) punched-tape control listing of inputs on line, 2) seven data conversion subroutines, 3) hourly and quarter-hourly readings, 4) audible signal before measurements started, and 5) power-fail hold and power-return restart subroutine.

Some of the temperature data show that air temperatures in the partially closed canopy were one to two C below those one meter above. Temperatures in a standard shelter were three to four C higher than canopy air. Exposed leaf temperatures generally followed the canopy air temperatures at night and during cloudy days but were lower by one to two C at full sun. Pima leaves were generally cooler by one C than the uplands. Between irrigations the Pima leaves showed about 1.5 bars greater stress than the uplands. The above results suggest in part that the Pimas transpire at greater rates.