Table 5. Fiber Properties and Laboratory Measurements, Regional Variety Test, Cotton Research Center, Phoenix - 1975.

Variety	Lint %	Seed Index	Fiber Length 2.5%	50%	U.I.	Fiber Strength 1/8 Pressley	Mic
Deltapine 16	36.2	11.6	1.16	.57	49	3.28	4.53
Deltapine 61	37.0	10.9	1.17	.59	51	3.30	4.65
Deltapine 66	37.3	9.7	1.12	.54	49	3.10	4.32
Deltapine 682	39.7	11.1	1.13	.55	48	3.07	4.18
Deltapine 703	40.2	9.5	1.11	.54	49	3.06	4.74
Deltapine 707	37.6	10.3	1.10	.53	48	3.17	4.51
Stoneville 213	36.3	11.3	1.12	.54	48	3.04	4.67
Stoneville 256	37.2	11.1	1.15	.56	49	2.91	4.80
Coker 530	36.9	11.9	1.18	.59	50	3.24	4.66
Coker 310	36.7	12.3	1.19	.59	49	3.26	4.33
1517-70	34.6	13.1	1.18	.59	50	3.77	4.28
1517-V	36.2	13.3	1.24	.66	53	3.89	4.14
1517-75	36.1	12.9	1.24	.65	53	3.92	4.09
AZ 64	37.6	12.0	1.15	.59	51	3.45	4.04
6608	37.4	12.6	1.15	.59	51	3.69	4.64
Paymaster 909	33.6	14.7	1.04	.54	52	3.09	4.86

HEXAPLOID COTTON

H. Muramoto

Hybridization and selection continued in the population of hexaploid cotton with emphasis on yield, fiber length, seed index, and boll size. With the release to the public of three non-commercial genetic breeding lines of hexaploid cotton by the Arizona Agricultural Experiment Station, small quantities of seed are available upon written request.

Samples of hexaploid cotton lint from the 1974 crop were sent to the USDA Cotton Spinning Laboratory at Knoxville, Tennessee for micro-spinning tests in 1975. The data show that the hexaploids lint as a group were short, with low reflectance, and B values that showed the yellowness to be similar to that of Pima cotton lint. Yarn tenacity of 22's yarn was about the same as that of the commercial upland cottons. Spinning waste in the hexaploid cotton lint was excessive.

An interesting characteristic called "deciduous bracts" was isolated from a population of hexaploid cotton. In the "deciduous bracts" plants, the bracts fall before the boll opens. This characteristic offers some economic potential as a means of solving the Byssinosis problem. Byssinosis, an ailment to the lungs of cotton mill workers, is caused by the minute organic particles mixed in the lint and is believed to be of cotton bract origin.

GENETICS AND CYTOLOGY

J.E. Endrizzi and G. Ramsey

1. Cytological tests of aneuploid types crossed with translocations for chromosome identification

Thirty-six different combinations were analyzed in 1975 for chromosome identification of selected aneuploids. The aneuploids consisted of three monosomes of the A genome, three telosomes and one isochromosome of the A genome, and five telosomes of the D genome. The results of the 36 combinations are given in Table 1. The negative (-) symbol in the table indicates that the chromosomes involved in the two types of structural changes are independent of each other and the positive (+) symbol indicates that monosome or telosome chromosome is one of the chromosomes in the translocation tester line.

able 1. Cytological Tests of Aneuploid Types Crossed with Translocations.

GENOME AND CYTOTYPE	Translocations (numbers 2-13 = A genome, 14-25 = D genome chromosomes)											
	T_{2-3}	T_{4-5}	T_{10-19}	T_{11-12}	T_{13-19}	T_{2-14}	T_{15-16}	T_{9-17}	T_{20-21}	T_{20-22}	T_{5-23}	T_{1-24}	T_{9-25}
A Mo 24					—								
A Mo 34								—					
A Mo 54			—	+[1]	—								
A 7-8-2-74 isoS			—	—	—								
A 7-3-4-74 teloL	—												
A AZ457 teloL		+[2]											
A AZ283 teloS			+					—					
D teloS/H20									+				
D gl3 teloS												—	—
D 1517D teloL			—			—	+[3]	—		—	—	—	
D AZ648 teloL			—				—	—		—	—	+	
D AZ647 teloS			—				—	+		—	—	—	—

- = not associated or independent, + = associated.

[1]Telosomic chromosome associated with the translocation. The F_1 plant had morphological characteristics typical of the monosomic Mo 54 parent.

[2]Chromosome 4: In addition, the telocentric chromosome was found to be associated with the ml ml mutant located on chromosome 4.

[3]Chromosome 16.

The results in Table 1 can be summarized as follows:

(a) The monosome chromosome Mo 54 is either chromosome 11 or 12. In this particular test, we recovered a telosome chromosome from the Mo 54 that was associated with the T11-12 translocation. Monosomes frequently misdivide to give telocentric chromosomes, and in this particular test the telosomic F_1 exhibit plant morphological characters very similar to the parental Mo 54 line; thus, we concluded that the telocentric came from Mo 54.

(b) The 7-8-2-74 cytotype which is an A genome isochromosome for the short arm was found to be independent of chromosomes 10, 11, 12 and 13.

(c) The 7-3-4-74 telocentric for the long arm is not chromosome 2 or 3.

(d) AZ457 involves a medium size chromosome of the A genome and it is telocentric for the long arm. Chromosomes 4 and 5 can be easily identified in the T4-5 translocation by their size difference. Test of the telocentric with T4-5 showed that the telocentric chromosome is chromosome 4. Concurrently with this test, a test was carried out with this telocentric and the mosaic leaf mutant ml ml which is located in chromosome 4. This test showed that the ml locus was associated with the telocentric chromosome and located in the short arm.

(e) The AZ 283 telocentric for the short arm of an A genome chromosome is chromosome 10 since it was associated with the A-D translocation T10-19.

(f) Telo S/H 20 is a telocentric chromosome segregant found in the progeny of monosome Mo 5 line which is chromosome 20. This test was conducted to verify that the telocentric was chromosome 20.

The test with the T20-21 translocation indicates that this telocentric is chromosome 20 and not 21 since the plant morphological characters of telocentric plants are essentially identical to that in the monosome line.

(g) The gl_3 is a telocentric chromosome believed to involve the D genome chromosome carrying the gl_3 gl_3 ne_2 ne_2 bw_2 bw_2 markers. The first cycle of crosses this year with these markers indicate that this telocentric chromosome does involve this particular unnumbered chromosome. The tests with the two translocations show that the telocentric is not chromosomes 24 or 25.

(h) The telocentric in the 1517 D line is associated with the T15-16 translocation indicating it is either of these two chromosomes. We concluded that the telocentric is chromosome 16 since we already have a telocentric for the long arm of chromosome 15 and this stock in no way resembles the 1517 D telocentric plants in the altered morphological characters.

(i) The AZ 648 telocentric chromosome and the AZ 647 telocentric chromosome are members of the D genome. The tests with the translocations show that AZ 648 is chromosome 24 and that AZ 647 is chromosome 17.

The monosomes and telosomes that have been identified for the most part for the different A genome and D genome chromosomes are shown below.

A Genome Chromosomes	Cytotypes currently available for the different chromosomes: Monosome	Telosome
1	Mono	telo L & S
2	Mono	telo L & S*
3	Mono	telo S*
4	Mono	telo L & S
5		telo L
6	Mono	telo L & S
7	Mono	telo L & S
8		
9		
10		telo S
11	Mono	telo L*
12		
13		

D Genome Chromosomes	Cytotypes currently available for the different chromosomes: Monosome	Telosome
14		
15		telo L
16	Mono	telo L
17	Mono	telo L* & S
18	Mono	telo L* & S*
19		
20	Mono	telo L & S
21		
22		
23		
24		telo L
25	Mono	telo L*
26		telo S

* unconfirmed