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1. Progeny test of spontaneous chromosome aberrations involving chromosome 1.

The detection of chromosome aberrations caused by events of non-disjunction and breakage of chromosome 1 taking place in the male gametophyte was reported in last year's MNL (45:119-123). The chromosomes were counted and a preliminary genetic analysis was done on exceptional F_1 individuals obtained in the cross $\underline{bz}_2$ x $\underline{Bz}_2$ $\underline{Bz}_2$.

Among different classes of chromosome aberrations, one group of 15 individuals was given the most attention, since 21 chromosomes were counted in each of the plants and odd ratios (far from disomic) were obtained in testcrosses to $\underline{bz}_2$. A high percentage (30-40%) of shriveled pollen grains was produced by these plants.

Samples of colored kernels (Bz/) taken from ears developed on some of these plants after pollination by the $\underline{bz}_2$ tester were planted last summer and reciprocally testcrossed to $\underline{bz}_2$. The data are summarized in Table 1. In many plants non-disomic ratios for the marker $\underline{bz}_2$ were observed, mostly associated with a high pollen sterility (30-50%). On the other hand, the majority of plants giving disomic ratios had normal pollen. Some near-disomic ratios are associated with pollen sterility, but in most of these cases reciprocal crosses differ in this regard (disomic vs. nondisomic) suggesting that a chromosomal aberration is still present.

Differences in reciprocal crosses were often observed with plants showing high pollen sterility, with regard to the ratio Bz : bz. In Table 2 the plants tested in reciprocal crosses are classified according to the ratios shown for the marker $\underline{bz}_2$. The majority of non-disomic ratios with a large excess of bz are found when the plants were tested as the pollen parents, while non-disomic ratios with a large excess of Bz were found more often when the plants were the pistillate parents.

Table 1. Segregation types found in reciprocal testcrosses to $\underline{bz}_2$ involving $\underline{Bz}$/ plants some of which are trisomic for chromosome 1.

Family	Crossed as:	Frequency of ears showing the following ratios:				Total
		disomic (or near)		non-disomic		
		N*	↟*	N	↟	
1990	♀	9	1	0	3	13
	♂	9	1	0	3	
1991	♀	7	1	0	3	11
	♂	7	0	0	4	
1992	♀	6	4	0	6	16
	♂	6	5	0	5	
1993	♀	1	2	0	3	6
	♂	1	1	0	4	
1994	♀	6	5	0	0	11
	♂	6	0	0	5	
1995	♀	10	0	2	0	12
	♂	9	0	3	0	
1996	♀	1	1	0	5	7
	♂	1	0	0	6	
Totals	♀	40	14	2	20	76
	♂	39	7	3	27	

*N = normal pollen
↟ = pollen with high sterility (30-50%).

Many points of interest are emerging from the development of the present study. First of all, pollen sterility is found in the progeny of six out of seven families tested, suggesting that chromosome 1 was originally involved in events of nondisjunction and breakage at the same time. Moreover, if nondisjunction was common to all cases, the location of breakages is likely to be different from case to case (which arose independently). Obviously, pollen sterility would be transmitted from one generation to the other, if the interpretation of the data is correct, when a broken chromosome 1 is present in a gamete where a normal

Table 2. Analysis of the segregation types found in reciprocal testcrosses to $\underline{bz}_2$ of the Bz/ plants shown in Table 1.

Family	Ratios (Bz:bz) obtained when the Bz/ plants were crossed:							
	as ♀ x $\underline{bz}_2$				as ♂ x $\underline{bz}_2$			
	near 1:1 ♀ and ♂	near 1:1 ♀ only	large excess Bz	large excess bz	near 1:1 ♀ and ♂	near 1:1 ♂ only	large excess Bz	large excess bz
1990	9	1	2	1	9	1	1	2
1991	7	1	3	0	7	0	3	1
1992	6	4	5	1	6	5	0	5
1993	1	2	2	1	1	1	0	4
1994	6	5	0	0	6	0	0	5
1995	9	1	2	0	9	0	2	1
1996	1	1	2	3	1	0	0	6
Totals	39	15	16	6	39	7	6	24

Note: Ears with a large excess of Bz or bz are those giving significant χ^2 deviations from the 1:1 ratio ($P < 0.01$).

chromosome 1 is also present, or when two chromosomes 1 are deficient for different regions in the same gamete. However, a possibility exists that pollen sterility is present in trisomic 1 plants regardless of chromosome breakages, since non-disomic ratios are not found in plants with normal pollen, except for family 1995.

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2. Genetic and cytological investigation of nonrandomly transmitted chromosomes in trisomic 10 plants.

An instance of nonrandom transmission of chromosomes in trisomic 10 plants was reported in last year's Maize Genetics News Letter (45: 115-119). Among the progeny of the cross $\underline{R}^{nj}\underline{R}^{st}\underline{r}$ x $\underline{rr}$ the $\underline{R}^{st}$ class was significantly less than the $\underline{R}^{nj}$ class. Moreover, the $\underline{R}^{nj}\underline{R}^{st}$ class was