3. EMS induced dominant mutation.

A dominant mutation was observed in a progeny when A C R (Brink stock) plants arising from seeds treated with ethylmethane sulphonate (EMS) were crossed with a c_1 sh Bz wx stock. A large mutant sector of 45 kernels was obtained on a cob containing 245 seeds. The phenotypic expression of the mutation is dominant over the wild plant type. The expression starts 7 days after sowing in both homozygous and heterozygous mutant plants in the progenies. The main character noted is that a curling of all the leaves takes place from both sides of the leaf margin lengthwise and the leaf appears as if it is rolled. Curling of the leaves in turn causes entangling at the leaf tips during the growth period. The leaf width is reduced to more than half the size of the normal leaf type. The leaf surface appears completely inverted, as the hair and rough surface were observed on the lower side of the leaf as against the upper side of the normal wild type. The hairs on the lower surface of the mutant leaf are more prominent. It has been observed that, due to curling and entangling of the leaves, the position of the leaf sheath is affected. The stress created on the leaf sheath produces abnormal apparent phylotaxy of the leaves on the stem. Four types of variations were noted (1) leaves are one sided, (2) leaves perpendicular to each other, (3) irregular, and (4) normal distichous. These appear in different frequencies and may be of secondary origin. The expression of the characters varies according to the nature of the wild type plants used in the crosses.

Homozygous (possible) plants have stunted growth and the size is reduced by half in comparison with heterozygous plants, in which some of the plants were stunted. Highly stunted plants did not produce silk but occasionally a few plants produced pollen. The mutant plants grow up to the sexual period. Selfing, sibbing and crosses to wild type plants revealed that the trait is maintained in a heterozygous condition only. So far, it has not been possible to obtain plants carrying the trait in a homozygous condition.

Table 3 shows the types of plants in progenies of selfed or sibbed mutant plants and in progenies from crosses to a few tester stocks. In the inbred progenies there is a significant deviation from 3:1 and 2:1 ratios. Progenies No. 1 and 4 clearly show a monogenic ratio. Crosses

Table 3

Types of plants in selfed and sibbed progenies of curled entangled (Ce/N) plants and in progenies from crosses to marker stocks ($\overset{o}{+}$)

Progeny	Seeds sown	Plant type			Marker stock as female	Plant type	
		Normal	Mutant			Normal	Mutant
			Stunted	Not stunted			
1) A70-34f-40	19	4	8	6	cShWx	-	-
2) B71-Ce-3/7	40	4	4	3	"	96	80
3) B71-Ce-4/5	50	9	8	11	"	60	55
4) B71-Ce-6/5	50	10	12	15	"	115	135
5) B71-Ce-7 x	18	1	3	4	"	75	81
6) B71-140C-3/4	152	35	48	30	su	62	72
7) B71-140C-5/6	47	11	10	16	"	93	103
8) B71-140C-7/8	81	14	16	22	sh_2	57	56
9) B71-31e-10/2	225	51	62	63	"	88	92
Total	682	139	171	170		646	674
			341				

Table 4

Observed types of plants in reciprocal cross of curled entangled plants with multiple markers (MM) $\underline{bm}_2$, $\underline{lg}_1$, $\underline{a}_1$, $\underline{su}_1$, $\underline{pr}$, $\underline{y}_1$, $\underline{gl}_1$, $\underline{j}_1$, $\underline{wx}$, $\underline{g}_1$.

Pedigree No.	Seeds sown	Plant type		Multiple marker stock as ♀	
				Plant type	
		Normal	Mutant	Normal	Mutant
1) B71-Ce-9/MM	65	28	26	44	48
2) B71-31f-4/MM	78	39	32	91	74
				48	54
3) B71-31C-4/MM	60	27	31	99	86
				25	25
4) B71-31C-8/MM	68	30	28	78	81
				69	74
5) B71-31f-3/MM	68	32	28	68	81
				24	18
				49	34
6) B71-31f-6/MM	112	57	48	51	37
				68	68
				88	61
7) B71-6C-2/MM	142	62	75	119	104
8) B71-11a-4/MM	69	24	32	116	129
9) B71-11b-2/MM	81	28	31	65	75
10) B71-11J-8/MM	104	44	49	86	84
Total	847	371	380	1188	1133

to tester stocks as female had equal proportion and segregation of mutant and normal plants.

Table 4 shows the exact reciprocal crosses between a multiple marker stock and the mutant plant. Mutant plants as either male or female parents showed equal proportions of mutant and wild type plants. Expression of the mutant phenotype in the F_1 generation indicates dominance and the equal proportions and segregation of both types in the reciprocal crosses suggests a monogenic behavior. The mutant gene responsible has been designated curled entangled (Ce).

S. E. Pawar
Chandra Mouli

4. Silk and pollen treatment.

Paraffin oil is found to be an extremely useful medium in the treatment of corn pollen with chemical mutagens (EMS) (Neuffer MNL 42-124). In view of this, pollen treatment was compared with a new method of treatment, i.e., silk treatment. A 0.1% EMS emulsion was made in paraffin oil. Pollen carrying the dominant markers R^r, A_1, Su_1 and Sh_1 was thoroughly mixed with paraffin oil containing EMS and immediately smeared on the silks of recessive stocks. In another set of experiments, the silks of recessive marker stocks were smeared with the above emulsion and then pollinated with the dominant marker stock. The frequencies of whole and partial losses of R^r, A_1, Sh_1, and Su_1 in the silk treatment were found to be 2, 1, 0.8 and 0.5 percent, whereas in the pollen treatment the frequencies were 2.1, 1.2, 0.8 and 0.6%, respectively. The frequency of marker losses seems to be almost the same in both treatments. Treatment of silks permits easy pollinations and favors good seed set as compared to the pollen treatment where some pollen is killed.

S. E. Pawar
Chandra Mouli

5. Genetic behavior of induced floury and opaque mutations.

Allelic tests between the standard fl_2 type and two newly obtained floury mutations showed that the new floury mutations are allelic to fl_2. The opaque type, when crossed with standard o_2, did not show allelic