more than 1/3 of the plants were late in expression and were found to be heterozygotes; most of the plants which expressed the mutant character earlier did not survive, since they were homozygotes. The expression was very effective and conspicuous in the crossed progenies. It seems possible that the induced mutant line might have some unknown factors that are influencing the mutant expression.

Earlier it was reported that the mutant trait was expressed only on the leaves, which are rolled from side to side in the form of a hollow cylinder. The expression starts between the first and fourth leaf stages and continues until the termination of the growth period. The leaves, being rolled, get entangled with each other, thus affecting their arrangement on the stem. Four types of phyllotaxy were observed in the progenies (Table 2). When all the entangled leaves of the mutant

Table 2. The effect of Ce on phyllotaxy.

Family	Handling	Total plants	Leaf arrangement			
			Distichous	Irregular	Perpendicular	One-sided
24	Control	668	172 (25.75%)	116 (17.35%)	244 (36.55%)	136 (20.35%)
	Leaves disentangled	667	642 (96.25%)	13 (1.95%)	8 (1.20%)	4 (0.60%)

were separated during the growth period, normal distichous phyllotaxy was discernible in nearly all the plants. In plants which did not receive this treatment, only 25% of the population showed a distichous arrangement. This segregation indicates the influence of another gene for the appearance of leaf orientation. A high percentage of perpendicular types was also noted in the control. This clearly demonstrates a pseudo-effect of the Ce gene on the plant type.

The Ce gene interacts with a recessive trait, liguleless (lg). Ce expression was at the one- or two-leaf stage in the majority (84.54%) of the growing seedlings carrying the liguleless marker in homozygous condition. However, in the liguled plants the expression was delayed to the three- or four-leaf stage (Table 3).

Table 3. The effect of lg on Ce expression.

Growth stage	Number of plants	
	Liguled (%)	Liguleless (%)
First leaf stage	31 (8.37)	186 (67.41)
Second " "	45 (12.16)	88 (27.16)
Third " "	197 (53.25)	42 (12.96)
Fourth " "	49 (13.25)	6 (1.85)
Fifth " "	48 (12.97)	2 (0.62)

Chandra Mouli

Leafy mutant

A recessive mutant appeared as a segregant in a population of an ear produced by a colourless kernel. This kernel was obtained following EMS treatment of A C R seeds; the plants were pollinated by c sh wx tester stock. This mutant had a few main features, of which one character proved to be monogenic. The recessive homozygous plants were taller than both the inbred lines (i.e., untreated) and the pollen parents. The mutant had increased numbers of leaves, ranging from 20 to 24 as against 12 to 15 in both the parents. This behaved as a recessive trait. The tassel emergence took place after 65 to 70 days, compared to 45 to 50 days in controls. These mutant traits were associated with increased numbers of ears (4 to 6) at each base, but had very few seeds. Tassel seeds also were present occasionally.

When the mutant was crossed with both parents, the F_1 had uniformly 16 to 18 leaves and flowered more or less at the same time as the parents, showing intermediate dominance expression for number of leaves. F_1 plants were crossed as female parent with normal and mutant pollen. F_2 segregation and backcross ratios (Table 1) indicate that mutant expression is governed by a single recessive gene. F_1 plants crossed with mutant pollen had F_1 types and mutant types in equal numbers, while F_1 plants crossed with normal pollen had F_1 types and normal ones in the same proportion. The segregation for plant height and ear number did not follow any specific pattern.

Table 1. Segregation of leafy mutant.

Cross	No. of progenies	Number of plants		
		Normal	F_1 type	Mutant
Mutant x ACR	5	-	96	-
" ⊗	27	122	209	144
ACR x Mutant	6	-	82	-
" ⊗	32	154	329	170
" x Mutant	8		335	379
Mutant x c sh wx	6	-	38	-
" ⊗	36	234	436	193
c sh wx x Mutant	9	-	34	-
" ⊗	32	306	539	289
" x c sh wx	8	179	204	

Chandra Mouli

EMS-induced jointed seed syndrome

An induced heritable character, "jointed seed syndrome" (MNL 48:14) continued to be expressed in the succeeding generations. In F_3 generation the following observations were noted; a brief summary of the previous generation is also included.

F_1: EMS treated seed. Silks crossed with normal pollen (2.5% Jointed seeds).
F_2: 51 plants expressed jointed seeds (0.3 to 5.4%). 21 plants normal.
F_3: 23 (Possible homozygotes); Jointed seeds in each plant (0.3 to 12.50%); 28 (Possible heterozygotes) segregated for mutant trait. From the 21 normals of the F_2, 10 plants (Possible heterozygotes) segregated for mutant trait, 11 plants (Homozygotes) gave normal.

The F_3 segregation ratio and the occurrence of the segregation of mutant type plants from normal plants suggests that the mutant expression is controlled by a single dominant factor and is possible maternally inherited.

Some of the plants which were considered to be homozygous were further selfed for two more generations. Individual plants in these progenies expressed the mutant trait ranging between 0.35 and about 12.50 percent. The frequency of jointed seeds obtained in some of the selfed plants in F_5 generation was quite high compared to the F_1 plant (Table 1).

From plants which had more than one ear, one was selfed and another was utilized for reciprocal crosses with normal plants; this revealed that the mutant expression was only in the female plant (Table 2).