TWO NEW DOUBLE MUTANTS OF PISUM

Gottschalk, W. Institute of Genetics, Bonn, Federal Republic of Germany

After X-irradiation of dry seeds, mutant 38E was selected in an M family. The plants are very long. They begin to flower under field conditions about one week earlier than the initial line due to the formation of the first flowers at very low nodes. In this respect, mutant 38E corresponds with the early flowering and ripening mutant 46A of our collection homozygous for gene efr as was borne out in the F1's between the two genotypes. In **F2,** all the plants were early flowering, confirming the F1 findings. The following segregation for stem length was obtained:

- 88 plants like 38E
- 29 plants like 46A

(expectation for 3:1=87.75:29.25).

Thus, mutant 38E is a double mutant homozygous for efr and a gene for very long internodes, with two genes having mutated more or less simultaneously in the same initial cell during irradiation. The neutron-induced mutant 2590A of our collection, like 38E, proved to be a double mutant for the same two genes. Furthermore, it was shown that the early flowering mutant 45C, obtained after X-irradiation, is identical with mutant 46A, both being homozygous for efr.

Thus, gene efr has mutated four times in our X-ray and neutron trials. In mutants 45C and 46A, only efr mutated, whereas efr and a gene for long internodes mutated in the embryos giving rise to mutants 38E and 2590A.

Long-stemmed pea mutants often show a markedly increased seed production as compared to the control values of the initial line or of other mutants with shorter internodes. This is to some extent also the case in mutant 38E. Its seed production was compared over 5 successive generations with the corresponding values of mutant 46A (Table 1).

Table 1. Number of seeds per plant produced by mutants 46A and 38E over five generations of comparison.

	Number of seeds per plant		
Year	46A	38E	% of 46A
1974	22.79	24.86	109.08
1976	16.26	16.94	104.18
1977	21.50	25.82	120.09
1978	26.40	32.60	123.48
1979	23.27	25.34	108.90

Thus, the gene for long internodes improves the selection value of gene efr if we take the seed production of the two genotypes as parameter.