Sh endosperms. In 1961 fifty of the colorless flinty seeds were planted Forty-one of the resulting plants were Bz, with two bz. Most of these plants were also B, Pl and Og. Forty of the plants were tested for c and CI. Thirty-two were cc, with two +/c and six not tested on cc stock Thirty-six were tested on CC stock with no evidence of the presence of CI. It was evident that the purple seed in 1959 was the result of a mutation from CI to c. In 1962, 10 of the 40 plants selfed in 1961 were tested for the response of the cc mutant to the action of Blotched. All ten of the lines tested blotched and were colorless when tested by c. As with the spontaneous CI → c mutant tested by Coe (Genetics 47: #6, p. 779 - 783, 1962), this mutant acted like normal recessive c. In 1960 two, and in 1961 three more mutants which appear to be mutations from CI to c were recovered from radiation experiments.

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3. Summary of recovered endosperm mutations.

We have been attempting since 1952 to induce mutations of the endosperm genes in chromosome 9 of maize. Below is a summary of the mutants which have proved to be inherited without detectable sterility into the R_2 generation. In experiments where more than one dose of radiation was used or in which more than one stage of microsporogenesis was radiated the populations are bulked as too few mutants are found at any one dose or stage to determine rates. In the stage experiments no populations are included which were radiated earlier than 13 days before pollen shedding. We have yet to prove a mutant from these stages because of the lack of coincidence between the embryo and endosperm.

These data do not indicate that the spontaneous mutation rate in the male is any different from those recovered for mutants recovered in the female. Therefore it would seem that radiation can induce mutations in maize which are in all ways similar to those which occur naturally at rates which are at least ten times greater than the control.

Year	Experiment		R^1 Seeds	Proved Mutants	Rate 10^6
1952	Chronic ♂ Radiation 5 r/d to 415 r/d		295,000	7 Sh→sh 1 Wx→wx	24
1952	Chronic ♀ Radiation 5 r/d to 415 r/d		30,000	1 Sh→sh	33
1953	20 hrs. 1320 r 13-20 days before anthesis		16,000	1 Sh→sh	63
1955	40 hrs. 2000 r 13-35 days before anthesis		18,000	3 Sh→sh	167
1958	23.5 hrs. 1880 r 14-35 days before anthesis		65,000	1 Sh→sh	15
1959	Chronic ♂ Radiation 29-14 days before anthesis 12 r/d to 129 r/d		123,000	2 Sh→sh 2 Wx→wx 1 CI→c	16 16 8
1960	23.5 hrs. 1080 r 13-28 days before anthesis		94,000	5 Sh→sh 2 CI→c	53 21
1961	23.5 hrs. 16-35 days before anthesis	987 r	83,000	2 CI→c	24
		705 r	69,000	1 Sh→sh	14
		517 r	79,000	2 Sh→sh	25
		270 r	97,000	1 CI→c	10
	Total		328,000	3 Sh→sh 3 CI→c	9 9

Control Populations Mutation in Male:

Year	R^1 Seeds	Mutants	Rate 10^6
1958	38,000	0	
1959	37,000	0	
1960	150,000	0	
1961	24,000	1 CI→c	
Total	249,000	1 CI→c	4.0
1953, 58-61	148,000	1 Wx→wx	7.0

1952-1961 Control Populations Mutations in Female:

R^1 Seeds	Mutants	Rate 10^6
4,089,000	0 CI→c	-
6,598,000	6 Sh→sh	0.9
6,180,000	14 Wx→wx	2.3
Coe(Genetics 47:779-783) 2,390,000	1 CI→c	0.4

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