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Short Communication

Performance of induced black seed coat mutant in cowpea

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The seeds of cowpea variety Charodi-1 which was found suitable for dryland of arid regions [1] having small seed size with brown coat colour were irradiated with gamma rays (0, 15, 25, 35 and 50 kR). M_1 generation was raised in rainy season of 1990. M_2 generation was raised as M_1 plant progeny rows. The observation on mutants for seed coat colour were recorded in M_2 generations (monsoon season of 1992). The plant population were around 9000-12000 for different treatments. A single black seed coat mutant appearing in M_2 generation of 25 kR dose was isolated. In M_3 (monsoon season of 1993) progenies of black seed coat mutants were studied along with the parent variety Charodi-1. The mutant was tested in subsequent generations of M_4, M_5 and M_6 (monsoon season of 1994, 1995, 1996) along with parent and check varieties under rainfed conditions. The mutant (CAZC-B) was also tested in All India Cowpea Co-ordinated Initial evaluation Trial in *Kharif* 1996 at different locations. The crop received a basal dose of fertilizers @ N20 Kg/ha and P2 O5 @ 40 Kg/ha during all the seasons. In each generation the segregants not conforming to the mutant plant type were discarded from the population of mutant.

Table 1. Details of the black seed coat mutants isolated in M_2 (rainfall in season 1992-425.1 mm)

Mutant or Parent	Mean plant height (cm)	Mean no. of pods per plant	100 seed weight (g)	Seed yield/ plant (g)	Maturity (days)
Charodi-1 (Parent)	52.7	26.4	7.6	7.68	67
CAZC-B	58.2	30.2	8.0	9.20	70

The data (Tables 1 and 2) gives a relative performance of mutant, its parent and other promising varieties under rainfed conditions of arid regions. A persual of data indicates that the black seed coat mutant, CAZC-B marginally excelled the parent variety Charodi-1 having increased plant height, pods/plant and days to maturity. The performance of the mutant, CAZC-B, was significantly superior against most of the check varieties except var. GC-3 and Pusa Phalguni in rainfed conditions in the year 1995. Thus, all through starting from the M_3 generation this mutant (CAZC-B) consistently showed a higher number of pods and better

Table 2. Relative performance of the mutant, parent and high yielding checks at Jodhpur.

Mutant or Parent	M_3 1993 (269.6 mm)			M_4 1994 (542.9 mm)			M_5 1995 (310.4 mm)			M_6 1996 (423 mm)		
	Pods no/plant	Seed yield (kg/ha)	Maturity (days)	Pods no/plant	Seed yield (kg/ha)	Maturity (days)	Pods no/plant	Seed yield (kg/ha)	Maturity (days)	Pods no/plant	Seed yield (kg/ha)	Maturity (days)
CAZC-B	27.0	430	62	36.0	1010	72	29.2	680	59	28.3	800	74
Charodi-1 (Parent)	24.6	412	58	32.2	951	72	28.0	610	57	24.3	642	75
Checks												
RC 19	-	-	-	24.4	800	75	NT	NT	NT	NT	NT	NT
GC-3	-	-	-	13.6	401	77	22.1	724	58	10.0	458	82
V-240	-	-	-	21.4	712	83	13.7	372	66	13.2	569	83
C-152	-	-	-	25.2	859	NT	NT	NT	NT	NT	NT	NT
V-130	-	-	-	11.2	330	82	11.4	190	75	15.0	448	84
Pusa Phalguni	-	-	-	16.4	599	70	16.5	565	54	15.7	483	70
SEm	-	-	-	-	61	-	-	44	-	-	57	-
CD 5%	-	-	-	-	130	-	-	121	-	-	165	-

NT : Not Tried; Figure in parenthesis indicate the amount of rainfall received during the season

grain yield over the parent and most of the high yielding checks. The development of high yielding mutant with altered plant characteristics is reported in cowpea [2].

The black seed coat mutant was crossed with its parent variety Charodi-1, a brown seed coat variety. The F_2 population indicated a segregation ratio of 3:1 (3 brown seed : 1 black seed) thus indicating that this black seed coat colour is governed by a single recessive gene.

The performance of CAZCB in Cowpea All India Co-ordinated Initial evaluation Trial in *Kharif* 1996-97 at various location revealed that mutant showed a promising performance in south zone locations against all the check varieties except GC-3, where in both locations its performance was better against check var, Pusa Phalguni. Its protein content (26.3) was also higher as compared to var. GC-3 (21.4) and Pusa Phalguni (24.1)

The present investigation concludes that the change in seed coat colour alongwith high yield attributes and potential could be achieved through induced mutations.

References

1. **Henry A. and H. S. Daulay**. 1988. Grow cowpea variety charodi-1 in Arid region. Indian Farming. **38**: 9-10.

2. **Sharma B.** 1996. Other pulses. *In*: 50 years of Crop Science research in India. (Eds. Dr. R. S. Paroda and K. L. Chadha) ICAR, New Delhi pp 297-317.