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EFFECTIVENESS OF SELECTION IN IRRADIATED POPULATIONS OF SUNFLOWER *(HELIANTHUS ANNUUS*-L.)

Wide genetic variability is a pre-requisite for effectiveness of any selection programme. It has been proved beyond any doubt that irradiation induces genetic variance in the treated populations (Gregory, 1968). Though mean is generally reduced in irradiated populations, variance is considerably enlarged, providing enormous scope for the selection of desirable types. Few lines in irradiated populations out yield the mother strain (Gaul, 1966). Advances by selection in irradiated populations have been made for heading date, plant height, seed weight, oil and for protein content in number of crop plants (Brock, 1965). By applying same selection pressure, genetic gains have been much more in the irradiated populations than in the unirradiated ones (Brock and Andrew, 1965). This report deals with the effectiveness of selection for heading date in M_2 generation of gamma irradiated populations of sunflower. Seeds of four Russian sunflower varieties, Viz., (1) VNIIMK (EC - 68413), (2) Peredovik (EC - 68414), (3) Armavirskij (EC - 68415), and (4) Armavertz (EC - 69874), were irradiated with 20, 30 and 40 Kr. of gamma rays. In M_2 generation all the plants which flowered within 50 days of sowing were selected and selfed Progenies of these selected plants were grown in M_3 generation in randomized block design with two replications and heading date was recorded. Data on mean and variance for number of days to flowering in M_3 generation are given in Table - 1. Mean number of days to flowering in the progeny of plants selected for earliness in M_2 generation was considerably less compared to the control. The maximum difference in the mean between irradiated population and the control was observed to be of more than 14 days in the variety EC-68413 at 30 Kr. Response to selection was particularly encouraging in the varieties EC - 68413 and EC - 69874. In general more variability was observed in irradiated and selected populations in comparision with the unirradiated control population.

These findings are well supported by the previous studies. Brock (1966 1967) and Brock *et al.*, (1971) have observed substantial genetic gains in M_3 population, following selection in M_2 generation. Apart from the progress achieved, Brock *et al* (1971) also reported considerably greater genetic variance in M_3 population as compared to the unirradiated check. The increased variance in the selected populations, observed in the present study, provides further scope for selection of still earlier types. ANOVA table (Table - 2) indicates that the treatment differences are significant where as replication differences

are not. This indicates that the earliness observed in M_3 generation is predominantly due to the genetic factors rather than due to the environmental effects. Thus a high heritability and good response to selection can be expected in further generations.

Table 1 Means and variances for number of days to flowering in the M_3 generation of sunflower

Variety	Gama Rays (Kr.)	Mean	Variance
EC—68413	0	66.58	14.17
	$\overset{*}{0}$	52.55	4.42
	20	55.32	23.82
	30	52.01	22.30
	40	54.76	27.53
EC—68414	0	64.08	13.09
	20	62.23	9.92
EC—68415	0	63.70	3.69
	$\overset{*}{0}$	56.70	4.02
	20	53.66	128.37
	30	57.28	19.50
	40	57.08	51.41
	0	69.99	8.87
	$\overset{*}{0}$	65.68	6.92
	20	60.69	19.58

$\overset{*}{0}$ indicate selected population for earliness from the unirradiated material. C. D. 4.67

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സംഗ്രഹം

ചില റഷ്യൻ സൂര്യകാന്തിയിനങ്ങളിൽ വിചരണതാ സൃഷ്ടിക്കാനുദ്ദേശിച്ച കൊണ്ട് 20, 30, 40 Kr മാത്രകളിൽ ഗാമാരശ്മി പ്രസരണം നടത്തി പരീക്ഷിച്ചതിൽ മുപ്പിന്റെ സ്വഭാവത്തിൽ പ്രകടമായ വൈവിധ്യം സൃഷ്ടിക്കാൻ കഴിയുമെന്നു കണ്ടു. M_2 തലമുറയിൽ 50 ദിവസത്തിൽ കുറഞ്ഞ സമയംകൊണ്ട് പൂത്ത എല്ലാ ചെടികളെയും സ്വപരാഗണവിധേയമാക്കി M_3 തലമുറയിൽ യാദൃച്ഛീകൃത ബ്ലോക്ക് സംവിധാനത്തിൽ വളർത്തി പരീക്ഷിച്ചതിൽ EC-68413 എന്ന ഇനം സൂര്യകാന്തിയിൽ 30 Kr മാത്രയിൽ 14 ദിവസത്തെ മുപ്പ് കുറവ് അനുഭവപ്പെടുകയുണ്ടായി. പൊതുവേപറഞ്ഞാൽ ഗാമാപ്രസരം ഏല്പിക്കുന്നതുവഴി ചെടികളിൽ വിചരണതാ പ്രകടമാംവിധം വർധിക്കുന്നതായി ഈ പരീക്ഷണം തെളിയിക്കുന്നു.

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