

Chapter - VI

**EFFECT OF TIME OF SOWING ON GROWTH
AND YIELD OF *Brassica campestris* L. cv.
B-54 IN THE PLAINS OF DARJEELING
CONDITION.**

INTRODUCTION

In view of the acute shortage of edible oil in the country; efforts are under way to introduce mustard (*Brassica*) in North Bengal specially in Darjeeling plains and adjoining areas in West Bengal.

From survey it appears that cultivation of mustard is very sporadic in nature. Local cultivators believe that cultivation of the existing species of *Brassica* is not profitable specially in the climatic condition of Darjeeling district. The quantity of this crop is neither that high nor expected too. So farmers have earmarked twenty percent of their land for growing vegetables only. Two varieties are commonly used by the farmers and which are *B. campestris* YSB-9 and *B. juneca*.B-85.

As this variation of climatic condition from one sowing environment to other differs, so it has been felt highly desirable to determine the optimum sowing time of *B. campestris* B-54 in Darjeeling condition.

MATERIALS AND METHODS

Materials : Seed of *B. campestris* B-54 were collected from the plants grown in the cultivated plot of North Bengal University Campus (Darjeeling district) in the year 1994-1995. Seed were sundried and preserved.

Nature of sowing : Seeds were sown directly in the experimental plot (5mx4m) of North Bengal University Campus.

Treatment of Spacing : 30cm row to row and 15cm plant to plant.

Experimental design : The plots were arranged in a simple randomised block design with three replications.

Experimental year : The experiment was conducted in two consecutive years 1994 and 1995.

The following characters have been considered during the trial of experiment.

- 1. Plant height :** The height of the plant was measured in centimeter scale.
- 2. No of primary branches :** Total number of primary branches were counted per plant.
- 3. No of Secondary branches :** Total number of Secondary branches were counted per plant.

4. Days for initiation of flowering : The observation was recorded from the days after sowing (DAS) of seeds.

5. Total life span of the plant : Total number of days after sowing (DAS) to the harvesting stage were counted for plants sown at different time.

6. Total number of silique per plant : The total number of fruits (Siliquae) in each plant was counted separately.

7. Total number of seeds per silique : The total number of seeds per silique was counted separately.

8. Weight of 1000 seeds : Sundried seeds were mixed thoroughly and 1000 seeds were weighed.

RESULTS AND DISCUSSION

Meteorological data during the period experiment on time of sowing of seeds of *B. campestris* B-54 in the plants of Darjeeling district has been represented in table 24. During investigation in connection with the effect of time of sowing of seeds on growth and yield attributes of *Brassica campestris* B-54 under natural rainfed condition in the plains of Darjeeling District, West Bengal, October sowing of seeds was observed to show the best growth performance for all the parameters. (Table 23). During the period the crop showed maximum height of 138.20 cm and maximum number of primary (8) and secondary (8) branches per plant. The plant took 32 DAS for initiation of flowering. Total number of siliquae per plant (308) and total number of seed per silique (16.2) were observed to be the highest in October sowing crops as compared to other.

TABLE- 23

Effect of time of sowing on growth and yield attributes of *Brassica campestris* B-54 sown at different time in the plains of Darjeeling condition during 1994-1995

Time of sowing	Plant height (cm)	No. of primary branches per plant	No. of secondary branches per plant	Days for initiation of flowering (DAS)	Total of siliquae per plant	Total number of seeds per Siliqua	Weight of 1000 seeds (gm)
10.09.94	96.12	5	4	40	60	6.0	1.4
10.10.94	138.20	8	8	32	308	16.2	3.28
10.11.94	130.19	7	6	24	236	16.1	3.09
10.12.94	111.32	6	5	19	161	14.7	2.97
10.01.95	94.41	4	3	17	51	5.1	1.04
10.02.95	28.53	2	1	14	1	0.6	0.23
10.03.95	6.63	1	1	-	-	-	-
10.04.95	4.72	1	1	-	-	-	-
10.05.95	3.82	1	2	-	-	-	-
10.06.95	59.30	4	3	68	7	1	-
10.07.95	60.20	5	5	60	13	3	1.0
10.08.95	80.15	7	6	49	50	5.1	2.6
Mean :	67.80	4.33	3.75	35.89	99.56	17.76	1.87
S.E. :	14.00	0.70	0.66	6.54	36.61	6.70	0.40
C.D. at 5% level :	30.83	1.54	1.46	15.08	84.43	15.46	0.93
C.D at 1% level :	43.50	2.17	2.06	21.94	122.84	22.49	1.36%

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Table - 24

Meteriological data during the period (1994-1995) of experiment on time of sowing of seeds of *B. campestris* B-54 in the plains of Darjeeling district

Month and Year	Total rainfall (mm)	Relative humidity (%)	No. of rainy days per month	Temperature	
				Maximum °C	Minimum °C
Sep.1994	121.0	81	8	30.2	16.2
Oct. 1994	7.5	77	3	28.1	8.0
Nov. 1994	5.9	71	7	21.5	3.5
Dec. 1994	48.2	76	7	16.4	2.3
Jan. 1995	28.8	74	3	17.5	2.3
Feb. 1995	160.1	84	13	14.9	3.5
Mar.1995	266.5	87	15	18.3	5.6
Apr. 1995	52.6	74	7	25.0	7.4
May.1995	48.7	71	6	26.1	7.9
Jun. 1995	71.6	70	7	29.3	10.3
Jul. 1995	62.7	74	6	30.1	14.3
Aug.1995	178.8	82	19	30.1	15.2

sown at different time. Besides the crop also showed the maximum weight of 1000 seeds to become 3.28 gm. The table also showed that November sowing of seeds had more or less the same effect as comparable to that of October sowing crops.

This sowing of seeds of *B. campestris* B-54 in the month of October-November may be considered as the optimum time to show the best growth performance and productivity in the plains of Darjeeling condition.

The table 23 also shows that productivity of seeds by the cultivar due to late sowing in the month of December may also be commercially acceptable to certain extent. In lately sown crops the maximum height of the plant was observed to attain 111.32cm with moderate number of Siliquae per plant (161) and total number seeds per silique (14.7) were observed to become moderately high. height of 1000 seeds became 2.97 gms.

It was also observed that seeds of this cultivar might be sown lately upto the month of January after that the yield decreased (Table 23). Seed sown in the month of March, April and May did not show any flower or fruit on the plant.

Tomer and Mishra (1991). Studied the influence of sowing dates on the yield of *Brassica juncea* L in ecological condition of Madhya Pradesh. They only considered two months of October and November resulted increase in the number of primary and secondary branches over 20 November sowing. Similarly the number of Siliquae per plant, the number of seeds per siliqua were observed to become higher in first date of sowing than the later sowing seed. They also pointed out that there was progressive reduction in all these characters in later dates. According to them, in early sowing the reproductive phase was comparatively longer which resulted in higher seed yield.

Similar results were reported by Jain et al (1986) and Shastry and Kumar (1981).

In some part of West Bengal, Paul and Ghosh (1987) also observed the influence of time of sowing of *B. juncea* cvr. Baruna. The Yield attributing characters like final height of the plants, number of primary branches per plant and number of siliquae per plant were observed to vary significantly with the date of sowing. They performed their experiment in three consecutive months of September, October and November. They observed that all characters in plants sown in the last week of September were much superior to those sown in November and significantly better than plants sowing in October. The seed yield also followed the same trend but the mutually significantly different but was significantly different but was significantly superior to that from November sowing plants.

Similar observation was noted in some region of South Bengal by different other authors (Bhattacharjee and Paul, 1973; Sen and Sur, 1961; and Pal et al, 1976)

It appears from earlier report that sowing of mustard upto third week of October would be much profitable specially in the southern part of West Bengal. Oal et al (1976) indicated that it could sometimes be deferred even up to the fourth week of November. There is no doubt that it depends on the prevailing agroclimatic situation of a particular season in a particular place.

According to Paul and Ghosh (1987) incidence of multiple pests on crop

often created difficult situations for crop raising. But sometimes manipulation of time of sowing of crops like rape and mustard may yield encouraging result to minimise or evade avoidable loss due to pests. Pest infestation may start quite early during the season and depending on climatic condition in southern part of West Bengal it may occur in high proportions even on crop sown relatively earlier during October (Pal et al 1976; Ghosh and Ghosh 1979). In spite of this the congenial climatic factor boost up vegetative growth of early sown crops leading to better seed yield.

In addition to this agronomic advantage of early sown crops the relatively warm conditions of October November are not so favourable for growth of aphid population as during cooler conditions of late December-January. By this time the period of mass flowering of early sown crop is almost over, thus this vulnerable vegetative phase of crop growth escapes ravages due to aphid. (Bhattacharjee 1961; Maini 1965 Pal et al 1976).

SUMMARY

In order to determine their optimum sowing time for seeds of *Brassica campestris* B-54 to show maximum productivity of seeds in the plains of Darjeeling condition investigation was carried out.

Experiments were conducted under natural rainfed condition in the plains of Darjeeling District. West Bengal.

Seeds were sown directly to the experimental plot (5mx4m), North Bengal University Campus in each month through out years of 1994/1995 starting from September 10, 1994.

The plots were arranged in a simple randomised block design with three replications. Various characters related to growth and yield attributes of the cultivar such as plant height, no of primary and secondary branches per plan; days for innitation of flowering, total no. of siliquae per plant, total number of seeds per siliqua and weight of 1000 seeds were taken into consideration.

October sowing of seeds was observed to show the best growht performance for all the parameters. November sowing of seeds was observed to show more or less the same growth performances as those observed in connection with October sowing of seeds. From experiment it was also derived that sowing of seeds of the cultivar might be continued to January in the plains of Darjeeling condition to acheive appreciable amount of productivity of seeds after that the cultivar failed to produce any seed during the period of sowing of seeds in the month of March, April and May.