

EFFECT OF DIFFERENT DATES OF PLANTING AND LINES ON THE GROWTH, YIELD AND YIELD CONTRIBUTING CHARACTERISTICS OF CAULIFLOWER

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ABSTRACT

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Planting dates significantly influenced the growth and yield of cauliflower lines at one month interval during 1st May to 1st August at the Regional Agricultural Research Station, Ishurdi, Pabna during 2007-2008 in summer season to delineate yield potentialities of cauliflowers. Plant height, number of leaves per plant, weight of whole plant, weight of marketable curd per plant and yield t/ha were better in CL0134 lines. Plant height, number of leaves per plant, weight of whole plant. Weight of marketable curd per plant and yield t/ha were also significantly differed among the planting dates. Weight of marketable curd per plant (419.61g) was obtained from 1st August planting in summer season. Highest curd yield (421.58g) was produced by 1st August planting when coupled with CL0134 lines. Significantly highest yield (17.56 t/ha) was obtained from the line CL0134 when combination with 1st August planting.

Key word: Cauliflower, planting time and lines, growth, yield.

INTRODUCTION

Cauliflower (*Brassica oleracea var botrytis* L) is one of the important cole crops in the world. It is one of the most important popular, nutritious winter vegetables, generally extending from October to March, when there is scanty or no rainfall. Growers generally plant this crop over a long period of time starting from also late August to late November (Ahmad, 1984). But now a day cauliflower is cultivated in summer season also. Cauliflower is more exacting in climatic requirements than cabbage, broccoli and many other crops. Planting time is a very important factor for cauliflower production. It cannot withstand extreme cold or heat (Christopher, 1958, Shoemaker, 1953 and Thompson and Kelly, 1985). The temperature plays an important role on both vegetative and generative phases for its successful production. Varieties or lines also generally differ in the requirement of temperature for curd initiation. Bose and Som (1986) stated that the optimum temperature for curd formation is 17^o C. According to them, cultivars or lines form curds at 20^o-25^o C and late cultivars or lines form at around 10^o C.

In recent year, the cultivated area under cauliflower has gone up to 37990 acres with a total production of 138750 metric tons BBS (2006). Chatterjee Swarup (1985) classified the Indian varieties are early, medium and late on the basis of suitability of temperature. In Bangladesh, cauliflower varieties are planted at different time of the season by the growers which results in many cases, partial or complete failure of undersized curds are common complain. The early buttoning and undersized curds production are common complaint in Bangladesh. Planting time is important for the production of different lines of cauliflower. Planting a line at optimum time is considered to be a key factor for successful production of cauliflower. Appropriate planting time is also an important factor responsible for obtaining higher yield. Due to different scientist have different comments about planting time of cauliflower vary region to region and country to country. Therefore, the present study was undertaken to delineate the yield potentiality of these lines with appropriate planting time during summer season in Ishurdi region.

MATERIALS AND METHODS

The experiment was conducted at the Regional Agricultural Research Station, Ishurdi, Pabna during the period from April to December 2007. Two lines of cauliflower viz-CL026 CL0134 and four dates of planting cauliflower viz; 1st May, 1st June, 1st July and 1st August were included in this study. The trail was laid out in Factorial Randomized Complete Block Design with three replications. The warmest (36^oc max) and coldest (10.3^oc) months as are June and January (Ara, 2001) The soil of the experimental field was clay loam in texture belonging to the high ganges river flood plain under AEZ II. The selected plot was well drained having p^H value 8.5. The plot size was (2.8 x 1.0 m) maintaining the spacing of 60 cm x 40 cm on each bed 2 consists of lines. The seedlings were raised in the seedbed. Healthy, Uniform Sized, twenty five days old seedling were transplanted in the experimental field under poly-tunnel. The new transplants watered with a watering cane until they were properly established.

Fertilizers were applied at the rate of 15 tons cowdung, 240 kg Urea, 150 kg TSP, 220 kg MP, 2 kg Boron and 1 kg Molybdenum per hectare. Half of cowdung, TSP, Boron and Molybdenum were applied in final land preparation and rest half of cowdung, 1/3 Urea and 1/3 MP were applied during pit preparation. The rest of Urea & MP were applied

in 3 equal installments at 15, 30 and 45 days after transplant. In growing season, weeding, mowing, mulching, irrigation, spraying fungicides and insecticides were done and when necessary. Data in respect of plant height, days to curd initiation, days to curd harvest, number of leaves per plant, weight of whole plant, weight of marketable curd per plant, curd length, curd breadth, marketable yield (t/ha) were recorded. The number of leaves per plant was considered as the number of leaves that were present on the plant at time of harvest. Curds were harvested at mature stage. The stage was determined visually and by pressing the curd with fingers to feel the compactness. Data were analyzed statistically and mean separation was accomplished following DMRT for interpretation of the results (Gomez and Gomez 1984).

RESULTS AND DISCUSSION

Effect of lines on cauliflower

The result in respect of growth and yield of lines are presented in Table 1. Significant differences were found between lines in respect of plant height, number of leaves per plant, weight of whole plant, weight of marketable curd per plant, and yield (t/ha) (Table 1). There was significant variation in the plant height between the lines. The tallest plant (50.08 cm) was obtained from the line CL026 and the shortest (39.0 cm) was found in CL0134. This result is in agreement with the findings of Salim (1995). Maximum number of leaves per plant (17.52) was produced by CL0134 and CL026 had minimum number of leaves per plant (16.36). This finding supports the results of Salim (1995). Early curd initiation (88.35 days) was found in CL0134 and late (90.23 days) in CL026. Lines did not influence the number of days required to curd harvest. The highest whole plant weight was significantly higher (607.91 g) was recorded in CL026 which was statistically superior to the other line. The lowest whole plant weight (587.10 g) was produced by the line CL0134. Lines were significantly differed from one another in respect of marketable yield. The highest marketable yield (310.57 g/plant) was obtained from CL0134. The lowest marketable yield (300.22 g/plant) was produced by CL026.

Influence of planting date on cauliflower

The effect of planting date on growth and yield attributing characteristics are given in the Table 2. All the vegetative growth parameters like plant height number of leaves per plant, whole plant weight, weight of marketable curd per plant and yield t/ha were influenced significantly by the date of planting except days to curd initiation, days to curd harvest, curd length and curd breadth.

Plant height was maximum at earlier planting on 1st May and then decreased each delay in planting. This result obtained corroborated with the findings of Islam *et al.* (1990). The vegetative growth in respect of number of leaves per plant was significantly influenced by the date of planting. Maximum number of leaves per plant (19.53) was obtained from 1st May (early planting) and minimum number of leaves per plant (14.72) was produced by 1st August (late planting). Similarly, the number of leaves per plant was maximum in 1st May planting and decreased gradually with the subsequent planting. This result is in agreement with the findings of Halim *et al.* (1999) and Rashid *et al.* (1990) and Islam *et al.* (1990). The plant under the first planting experienced a longer duration of higher temperature during vegetative growth. These findings are in close conformity with that of Haine (1959) and Skapski (1966). The highest weight of whole plant (714.36 g) was obtained from 1st August planting in summer. This was statistically differed from the other planting times. The lowest weight of whole plant (492.41 g) was found in 1st June planting. The highest marketable curd weight (419.61 g) was produced by 1st August planting in summer season. This was superior to all other treatments. The curd yield (17.48 t/ha) was obtained from 1st August planting. The curd yield increase significantly as the planting delayed in summer season. The late planting exposed the plants to shorter duration to favorable climate for vegetative growth while the lower temperature helped on set of reproductive phase earlier in summer season.

Effect of interaction between planting date and lines of cauliflower

Among the characters studied days to plant height, number of leaves per plant, weight of whole plant, weight of marketable curd per plant and yield t/ha were statistically significant by the interaction effect of date of planting and lines (Table 3). The highest plant height (53.33cm) was obtained from CL026 when coupled with 1st May planting which was statistically similar to 1st June planting when combination with CL026 (52.99cm). The result revealed that early planting produced higher number of leaves per plant and decrease as the date of planting delayed. These findings are similar to Halim *et al.* (1999). The interaction between date of planting and lines was not significant in case of days to curd harvest. The period of curd harvest was longer in CL026 line (127.53 days) when planted on 1st July. The line CL0134 took minimum period for curd harvest (102.20 days) when combined planting date 1st May. The highest whole weight of plant (718.83g) was obtained the line CL026 when coupled with 1st

August planting which was statistically identical to CL0134 when combination with 1st August planting (709.89g). The lowest (534.72g) was produced when CL026 coupled with 1st June planting. The interaction between date of planting and lines was significant in marketable curd weight. The weight of marketable curd per plant (421.58g) highest in CL0134 when coupled in 1st August planting in summer season. The maximum curd length and breadth were 12.17cm and 9.49cm, respectively in CL0134 line when combination with 1st August planting. The yield of 17.56 t/ha was obtained from CL0134 when coupled with 1st August planting. This was superior to all other treatment combination. It may be inferred from the results that irrespective of the lines studied cauliflower should be planted in August in summer season performance better.

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Table 1: Effect of lines on the yield and quality of cauliflower

Variety	Plant height	Days to curd initiation	Days to curd harvest	No. of leaves per plant	Weight of whole plant (g)	Weight marketable curd/plant (g)	Curd length (cm)	Curd breath (cm)	Yield t/ha
CL026	50.08 a	90.23	110.72	16.36 b	607.91 a	300.22 b	10.11	7.23	12.50 b
CL0134	39.0 b	88.35	109.57	17.52 a	587.10 b	310.57 a	10.29	7.13	12.94 a
F-test	**	NS	NS	*	*	*	NS	NS	*

In column, similar letter(s) do not differ significantly at 5% (*) and 1% (**) level of significance, NS=Not Significant

Table 2: Effect of dates of planting on the growth and yield of cauliflower

Treatment	Plant height	Days to curd initiation	Days to curd harvest	No. of leaves/plant	Weight of whole plant (g)	Weight of marketable curd/plant (g)	Curd length (cm)	Curd breath (cm)	Yield t/ha
1 st MAY	53.23 a	81.07	102.27	19.53 a	563.07 c	263.76 c	10.10	6.11	10.98 c
1 st JUN	50.21 b	91.27	106.50	17.73 b	492.41 d	235.40 d	8.33	5.63	9.80 d
1 st JUL	49.30 b	95.13	126.10	15.78 c	620.18 b	302.81 b	10.24	7.51	12.61 b
1 st AUG	45.59 c	89.70	105.70	14.72 d	714.36 a	419.61 a	12.14	9.46	17.48 a
F- test	**	NS	NS	*	*	*	NS	NS	*

In column, similar letter(s) do not differ significantly at 5% (*) and 1% (**) level of significance, NS=Not Significant

Table 3: Interaction effect of planting dates and lines on the yield and yield contributing characteristics of cauliflower

Cultivars	Treatment Planting time	Plant height (cm)	Days to curd initiation	Days to curd harvest	No. of leaves/plant	Weight of whole plant (g)	Weight of marketable curd/plant (g)	Curd length (cm)	Curd breath (cm)	Yield t/ha
CL026	1 st MAY	53.33a	82.73	102.33	18.40 b	556.98 c	254.66 e	9.97	6.20	10.61 e
	1 st JUN	52.99a	92.60	106.60	17.00 c	534.72 c	234.32 f	8.13	5.91	9.76 f
	1 st JUL	50.40ab	95.27	127.53	15.50 de	621.11 b	294.25 b	10.23	7.33	12.26 b
	1 st AUG	43.61c	90.33	106.40	14.56 e	718.83 a	417.65 a	12.11	9.47	17.40 a
CL0134	1 st MAY	48.20b	79.40	102.20	20.67 a	569.16 c	272.85 d	10.22	6.02	11.36 d
	1 st JUN	47.56a	89.43	106.40	18.45 b	450.10 c	236.47 f	8.53	5.36	9.85 f
	1 st JUL	47.42b	95.00	124.67	16.07 cd	619.25 b	311.37 b	10.25	7.69	12.97 b
	1 st AUG	43.12b	89.07	105.00	14.89 e	709.89 a	421.58 a	12.17	9.45	17.56 a
F- test		*	NS	NS	*	*	*	NS	NS	*

In column, similar letter(s) do not differ significantly at 5% level of significance, NS=Not Significant