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Revealing Cauliflower (*Brassica oleracea* var. *botrytis*) Genotypes for Seed Yield and its Contributing Characters on Different Sowing Dates

Navdeep Singh and Gurdeep Singh

Department of Horticulture

Guru Kashi University, Talwandi Sabo, Bathinda-151302, Punjab, India

ABSTRACT

The experiments were conducted during the successive season 2022 at Vegetable farm, Guru Kashi University, Talwandi Sabo to evaluate the Cauliflower (*Brassica oleracea* var. botrytis) genotypes for seed yield and its contributing characters sown on different sowing dates. The results revealed that improved PSC 117-118 genotype recorded earliest days to 50% flowering (95.66d), number of leaves 24.45 by Kartiki genotype, breadth of leaf 24.23 cm in PSC104, maximum polar diameter 18.27 cm by Noval and maximum length of leaf 42.17 cm, maximum equatorial diameter 27.15 cm, minimum days to siliqua maturity 156.66d, pod length 7.64 cm, pods per plant 712, 1000 seed weight 1.78 g, grains per pod 12.44, highest seed yield per plant 12.35 g was recorded in Super 70 as compared with the other cauliflower genotypes. The combined effect of sowing dates and genotypes showed that crop sown on 8th September with PSC104, PSC117-118, Noval, Kartiki genotypes performed well in respect of growth characters and Super 70 genotype in seed yield parameters were found to be the best from all other varieties.

Key Words: Cauliflower, Genotypes, Siliqua, Sowing date, Yield.

INTRODUCTION

The genetic constitution of the plants determines their yielding ability but the extent to which the potential actually depends is suitable environment in which they grow. It's a well-known fact that a crop when sown at optimum time is able to exploit all the environment factors efficiently in the process of dry matter accumulation. The date of sowing is governed mainly by temperature, sunlight intensity, duration and rainfall. These are the crucial factors that can decide establishment, growth and performance of crop through changing morphological system, physiological functioning and time available for the crop to complete its life cycle. Seeds of cauliflower are produced in the country in a small scale but the maximum amount of seeds of cauliflower is imported from other countries. Cauliflower requires optimum temperature and humidity conditions for seed production. The optimum temperature for cauliflower withstands is 10 to 15 0C (Din *et al*, 2007). Lavanya *et al* (2014) recommended that optimum temperature is suitable treatment combination for higher seed yield. Refai and Hussan (2019) concluded that performance of cauliflower declined gradually in each successive delay of transplanting date among the four transplanting dates (1st July, 15th July, 1st August and 15th August). So, planting improved Assiut genotype at 1st July recorded the highest yield. Meanwhile, planting the same genotype at 15th July is more efficient for using the heat and radiation. Sharma *et al* (2018) studied that maximum temperature exhibited significant negative correlation (r=-0.472) with seed yield which indicates that rise in maximum temperature, affects seed production adversely while forenoon humidity exhibited positive correlation (r=0.411) with cauliflower seed yield. Kumari *et al* (2019) concluded the plant height, leaf area, polar diameter, equatorial diameter, number of bolters/plant, number of siliqua/plant, number of seed/siliqua, seed yield/plant and 1000 seed weight were found significant when seeds were

Corresponding Author's Email - navdeep.brar50@gmail.com

sown on 10th August. The present study was undertaken with objectives to evaluate the different cauliflower genotypes in various environments for growth parameters and seed yield parameters.

MATERIALS AND METHODS

The experiment carried out in Guru Kashi University Research Farm comprised of two main parameters, namely the sowing dates 8th September (first date) and 10th October (Second date) and the cultivars were Kanchan, Noval, Golden 1100, PSC 105A, Krishma, PSC106A, PSC104, PSC666, PSC117-118, PSC 107 A (117-118), Super 70, Kartiki and 666F2. The experiment consisted of 26 treatment combinations, and was laid out in randomized complete block design (RCBD) with three replications. The whole experimental area was divided into three equal blocks. A distance of 45 cm was maintained between the ridges and 45 cm between the plants within the each plot. The blocks were kept to facilitate different intercultural operations. The crop was raised by following the package of practice recommended by PAU, Ludhiana. The observations recorded during the course of investigation were number of leaves per plant, leaf length (cm), breadth of leaf, equatorial diameter (cm), polar diameter (cm), days to 50% flowering, days to siliqua maturity, pod length (cm), pods per plant, 1000 seed weight (g), grains per pod and seed yield per plant (g) of three randomly selected plants was recorded and average was calculated. The data from the experimental field were analyzed separately for each experiment for different growth characters and yield attributes with the help of OPSTAT (Statistical Software Package for Agricultural Research Workers) (Sheoran *et al*, 1998).The critical difference at 5% level of implication was calculated to equate the mean different treatments.

RESULTS AND DISCUSSION

The number of leaves was recorded significantly highest 24.45 in Kartiki genotype which was at par with PSC 105A (24.33) and followed by Krishma with 23.52 number of leaves, the crop which was sown on Ist date. The maximum number of leaves were shown by PSC 105A (22.34) sown on 2nd date. It was observed that highest leaf length (42.17 cm) was noticed in super 70 genotype with sowing date 8th September. The crop sown on 2nd date, Super 70 genotype showed significantly maximum 40.35 cm leaf length. The result was in conformity with the earlier findings of Kumar *et al* (2002). It was recorded that there was significant increase in breadth of leaf 24.23 cm in PSC104 genotype followed by PSC106 A with 22.30 cm leaf breadth sown on Ist date. The crop sown on 2nd date, the significantly maximum leaf breadth 22.67 cm was recorded in PSC104 genotype.

There was a wide variation among vegetative growth of the different genotypes of cauliflower (Zaki *et al*, 2012; Meena, 2017). Significantly maximum equatorial diameter 27.15 cm and 25.46cm was recorded in Super 70 and PSC106A genotype when crop was sown on Ist date and 2nd date, respectively. Polar diameter were markedly enhanced by sowing seeds on Ist date in comparison with the late sowing crop. In the early sowing date polar diameter was 18.27 cm while in the late sowing date polar diameter was 17.17 cm with Noval genotype. On Ist date sown crop, minimum days required for days to 50% flowering (95.66) were recorded in the PSC117-118 and the crop sown on 2nd date, minimum 96.34 days to 50% flowering was noted in PSC117-118 and was at par with PSC666 (96.35 days). on Ist date sown crop, minimum days required for siliqua maturity (156.66 days) were recorded in the Super 70 and minimum 158 days to siliqua maturity was taken by PSC 666 genotype and was at par with PSC 117-118 (159 days) in the crop which was sown on 2nd date. Maximum 7.64 cm pod length was noted in Super 70 and was at par with PSC117-118 (6.95 cm) in crop which was sown on Ist date. Sown crop on 2nd date, the maximum 6.76 cm pod length was recorded in PSC105A genotype.

The highest pods per plant were decidedly enhanced by sowing seeds on early date in contrast with the late sowing crop. In the early sowing date, pods per plant was 712 and 707 in Super 70 genotype in late sown crop. The 1000 seed weight was recorded significantly highest 1.78 gm under Super 70 genotype and was at par with PSC 117-118 (1.76 gm) when sown on Ist date. The 1000

Table 1. Effect of sowing dates on number and length of leaf (cm), breadth of leaf (cm), equatorial diameter (cm) and polar diameter (cm) in cauliflower.

Parameter	Number of leaves (No.)		Length of Leaf (cm)		Breadth of leaf (cm)		Equatorial diameter (cm)		Polar diameter (cm)	
Genotypes	8th September	10th October	8th September	10th October	8th September	10th October	8th September	10th October	8th September	10th October
KANCHAN	22.15	20.12	30.38	29.56	18.65	17.34	21.65	19.78	13.4	11.13
NOVAL	21.48	19.34	33.15	31.45	17.93	16.34	24.39	23.17	18.27	17.17
GOLDEN 1100	20.29	18.12	38.83	36.57	17.85	16.25	23.63	21.47	16.57	15.34
PSC 105A	24.33	22.34	36.1	34.35	19.46	18.56	23.25	21.36	15.57	14.37
KRISHMA	23.52	21.45	33.77	31.23	21.46	19.34	24.25	23.45	14.45	13.25
PSC106A	21.11	19.45	35.48	31.78	22.3	21.12	26.11	25.46	17.17	16.34
PSC104	22.48	20.35	38.43	35.37	24.23	22.67	20.71	19.74	16.26	15.46
PSC666	23.22	21.23	40.15	38.49	19.82	17.23	25.84	23.67	14.22	14.26
PSC117-118	21.29	18.23	41.34	39.29	21.09	19.58	22.49	20.37	15.36	15.13
PSC 107 A(117-118)	20.41	18.26	39.63	37.59	17.83	16.26	25.63	23.27	14.81	14.25
SUPER 70	19.48	17.78	42.17	40.35	17.53	16.58	27.15	25.37	14.47	14.12
KARTIKI	24.45	21.89	33.66	30.66	15.82	14.26	24.56	23.43	14.72	14.45
666 F2	23.11	20.24	32.48	30.12	16.82	15.26	23.11	21.25	15.23	14.11
CD at 5%	0.219	0.19	0.135	0.15	0.065	0.063	0.089	0.086	0.26	0.24

Table 2. Effect of sowing dates on days to 50% flowering, days to siliqua maturity, pod length (cm), pods per plant and 1000 seed weight (g.) in cauliflower.

Parameter	Days to 50% flowering		Days to siliqua maturity (days)		Pod length (cm)		Pods per plant (No.)		1000 seed weight (g.)	
Genotypes	8th September	10th October	8th September	10th October	8th September	10th October	8th September	10th October	8th September	10th October
KANCHAN	118.66	119.35	173	175	4.32	4.23	412.66	414	1.56	1.54
NOVAL	97.66	97.34	158	160	5.95	5.25	709.33	704	1.71	1.61
GOLDEN 1100	104.66	104.35	168	170	6.33	6.12	271	698	1.67	1.56
PSC 105A	98.33	97.24	160	163	6.04	6.76	705	700	1.68	1.58
KRISHMA	108.66	107.34	163	165	5.82	5.34	293	291	1.65	1.54
PSC106A	113.66	112.13	156	164	6.63	6.23	271	268	1.61	1.53
PSC104	108.66	107.35	168	171	5.26	5.12	274	268	1.42	1.35
PSC666	97.33	96.35	158	158	6.9	6.46	291	284	1.47	1.42
PSC117-118	95.66	96.34	158	160	6.95	6.34	286	279	1.76	1.65
PSC 107 A(117-118)	108.66	107.36	168	159	5.99	6.45	281	272	1.52	1.61
SUPER 70	96.33	97.32	156	161	7.64	5.24	712	707	1.78	1.68
KARTIKI	108.33	107.14	158	160	5.23	6.01	279	273	1.61	1.49
666 F2	107.33	106.24	166	168	5.09	4.89	284	275	1.55	1.49
CD at 5%	0.95	0.93	1.59	1.34	0.059	0.054	1.58	1.23	0.02	0.04

Table 3. Effect of sowing dates on grains per pod (No.) and seed yield per plant (g.) in cauliflower.

Parameter	Grains per pod (No.)		Seed yield per plant (gm.)	
Genotypes	8th September	10th October	8th September	10th October
KANCHAN	9.64	8.23	7.34	7.11
NOVAL	11.72	10.24	10.33	9.6
GOLDEN 1100	6.74	7.25	9.19	7.4
PSC 105A	11.14	10.02	7.16	7.03
KRISHMA	9.75	9.14	6.25	5.68
PSC106A	10.08	9.25	6.47	5.12
PSC104	7.83	7.15	6.31	5.12
PSC666	7.36	7.13	5.36	5.12
PSC117-118	11.83	10.24	11.93	9.12
PSC 107 A(117-118)	8.33	8.23	6.34	5.89
SUPER 70	12.44	11.79	12.35	10.13
KARTIKI	8.64	8.15	5.41	5.12
666 F2	8.91	8.40	5.747	5.65
CD at 5%	0.102	0.98	0.12	0.19

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