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Short Note

Performance of cabbage hybrids under cold desert condition of north -west Himalaya

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The choice of crops to the farmers of cold desert areas (Lahaul & Spiti, parts of Kinnaur and Chamba districts of Himachal Pradesh) is limited due to single cropping season (April-September), and also due to very less cropped area (3.6 thousand hectares) out of total geo-graphical area of 911.2 thousand hectares (Anonymous, 2004). This necessitates growing of high value crops with high returns. Cabbage (*Brassica oleracea* var *capitata* L.) is one of the important crops being grown in these areas as an off-season crop during summer months. It brings lucrative returns to the farmers, as bulk of the produce is exported to markets located in the plains. High hills of the state are also well known for seed production of cabbage on account of its specific chilling requirement. Furthermore, the major constraints in increasing and stabilizing cabbage production and prices are the lack of early maturing, high yielding and compact headed varieties. The varieties popularly grown in these areas *viz.*, Golden Acre, Pride of India and Pusa Mukta have a tendency to produce loose and unmarketable heads in large proportions during summer months in the hills. Hybrids are receiving considerable attention of the growers and becoming increasingly popular for commercial cultivation. There are reports to give higher yield and can remain marketable for a longer period Bhardwaj *et al.* (1993), Gill (1989) and Seshadari (1990). Therefore, an attempt was made to evaluate the cabbage hybrids along with open pollinated varieties as the checks.

Twelve cabbage hybrids *viz.*, BC-76, BC-79, Cabbage Sona, Summit, Bharat, H-125, H-225, H-251, H-415, H-601, H-3637 and H-5701 and three varieties as check *viz.*, Golden Acre, Pride of India and Pusa Mukta were grown in a randomized block design with three replications during summer season of 2004 at the Experimental Farm of Research Sub Station Lari, Spiti (height 3300m asl) Himachal Pradesh. The seeds were sown in nursery beds on 15th April, 2004 under glass house conditions and all management precautions were taken till the seedlings become ready and transplanted in the experimental plots on 28th May, 2004. Six plants from each plot were randomly marked to record data on different quantitative characters (Table 1). Data were analyzed as per the standard procedures.

Significant differences among treatments (hybrids/varieties) were observed for all the traits studied (Table 1). Cabbage heads took 87.33 days (Cabbage Sona) to 111.33 days (H-225 and H-415) days to attain marketable size. However, the earliest maturing hybrid Cabbage Sona was statistically at par with Pusa Mukta (93.33 days) and Golden Acre (94 days) and attained marketable maturity 20.23 per cent earlier than Pride of India.

A higher proportion of non–wrapper leaves was observed in the hybrids in comparison to all three check varieties. The minimum number of non–wrapper leaves was observed in Pride of India (14.33), which was 76.76 per cent less then cabbage Sona, where the highest number of non–wrapper leaves (25.33) was noticed. Bhardwaj *et al.* (1993) also recorded less number of non–wrapper leaves in Pride of India (check) in comparison to hybrids.

Stalk length ranged from 3.67cm (Summit) to 6.83cm (H-125). Stalk length of hybrid Summit was statistically at par with Golden Acre (4.13cm). It had 42.51and 52.59 per cent lesser stalk length than Pride of India (5.23cm) and Pusa Mukta (5.6cm), respectively. The other hybrids, which produced short stalk length, were Cabbage Sona (4.0cm) and H-251 (4.47cm).

Most of the hybrids revealed higher gross weight of its heads in comparison to all the three checks evaluated. The gross head weight ranged from 0.89 kg (Golden Acre and Cabbage Sona) to 1.53 kg (H-5701). The hybrid H-5701 gave the highest gross weight of the heads followed by Summit and H–3637. The gross

weight of outstanding hybrid H-5701 was 41.83 and 36.6% higher over the checks Golden Acre and Pride of India, respectively.

As regard the net weight of head, hybrid H-5701 produced the maximum weight of the head (1.27 kg) followed by H-3637 (1.09 kg). The other hybrids, which gave significantly higher net weight of the head, were Summit (0.85 kg), Bharat (0.75 kg) and H-125 (0.72 kg) in comparison to all the three checks. Remaining hybrids were at par with check varieties. The difference for net weight of the head amongst the standard varieties was also not significant. The standard check variety Pusa Mukta revealed the maximum percentage of marketable heads (81.67%), however, it was statistically at par with other check varieties, Golden Acre (74.67%), Pride of India (72.0%); and with hybrids H-3637 (81.33%), H-5701 (75.33%), and Summit and Bharat (75% each). Cabbage Sona and H-251 followed by H-415 and H-601 produced the minimum percentage of marketable heads.

Table 1. Performance of cabbage hybrids and varieties under cold desert conditions of Himachal Pradesh

Genotype	Days to marketable maturity	Number of non - wrapper leaves	Stalk length (cm)	Gross head weight (kg)	Net head weight (kg)	Marketable heads (%)	Marketable yield (q/ha)
Hybrids							
BC-76	90.00	22.67	5.67	1.08	0.67	65.00	141.87
BC-79	88.67	17.33	6.13	0.92	0.63	65.00	136.27
Cabbage Sona	87.33	25.33	4.0	0.89	0.51	60.00	101.30
Summit	88.67	20.00	3.67	1.36	0.85	75.00	178.13
Bharat	96.00	22.67	6.77	1.18	0.75	75.00	186.11
H-125	107.33	18.00	6.83	1.16	0.72	70.00	167.57
H-225	111.33	24.67	5.57	1.03	0.60	65.00	130.91
H-251	107.33	19.33	4.47	0.91	0.61	60.00	121.69
H-415	111.33	17.00	5.13	0.96	0.56	60.67	112.11
H-601	108.00	17.00	6.57	0.91	0.59	62.67	123.06
H-3637	106.67	18.33	6.8	1.35	1.09	81.33	293.43
H-5701	109.33	20.00	5.53	1.53	1.27	75.33	315.99
Varieties							
Pusa Mukta	93.33	14.67	5.6	0.94	0.62	81.67	167.97
Golden Acre	94.00	14.67	4.13	0.89	0.65	74.67	160.78
Pride of India	105.00	14.33	5.23	0.97	0.65	72.00	154.01
CD (P=0.05)	10.11	5.61	0.87	0.20	0.15	10.09	44.93

The marketable head yield (q/ha) showed significant variation and the maximum yield 315.99 q/ha and 293.43 q/ha, respectively was observed in hybrids H-5701 and H-3637. The other hybrids were either at par or significantly less than the standard check varieties. The hybrids H-5701 and H-3637 performed better under cold desert conditions of Himachal Pradesh as these recorded 49.12 and 45.21% higher yield, respectively over the standard check variety Golden Acre. However, further confirmation of results is suggested over time and space for recommendation of these hybrids.

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