

VARIETAL SCREENING IN CABBAGE (*BRASSICA OLERACEA* L. VAR. *CAPITATA*)

The high range zones of Kerala, a sub-region of Western Ghats with an elevation of 750 m above msl occupies 28.67% of the total cropped area of the state. Wayanad and Idukki districts and Nelliampathy and Attapadi Panchayats of Palakkad district enjoy a mild subtropical climate and the low temperature prevailing during September-January is highly conducive for cultivation of cabbage and other cool season vegetables. In spite of suitable climatic conditions, the poor adoption of cool season vegetables by the farmers are due to the unavailability of seeds and unawareness and lack of technical know how on the cultivation practices. Moreover, right selection of the right variety for each locality decides the success of cultivation. With the objective of identifying the suitable varieties for the cool areas of high ranges of Kerala, sixteen genotypes of cabbage were evaluated at the Regional Agricultural Research Station, Ambalavayal, Wayanad.

Sixteen genotypes of cabbage (*Brassica oleracea* L. var. *capitata*) including eight open pollinated varieties and eight  $F_1$  hybrids both from government research organisations and private seed companies were evaluated during the winter months of September 1993 to January 1994 in Ambalavayal. The station is located at an altitude of 974 m above msl with mild subtropical climate. The minimum temperature during winter may go as low as  $10^\circ\text{C}$  with a mean minimum of  $14^\circ\text{C}$  and mean maximum of  $31^\circ\text{C}$ . The experiment was conducted in randomised block design with two replications. Plants were spaced at 50 x 45 cm and plot size was  $6.75\text{ m}^2$  occupying 25 plants per genotype per plot. Cultural practices were followed as per the recommendations of the Kerala Agricultural University, (KAU, 1993). Observations on plant and head characters were recorded.

The cabbage genotypes differed significantly for all the characters studied except number of leaf scars at harvest. Height of plant (Table 1) was maximum in Golden Acre (24.17 cm) followed by September (23.79 cm). Spread of

plant which is an important factor deciding population density and plot yield was the lowest in  $F_1$  hybrid HOE-786 (27.67 cm) which can be planted at a low spacing of 30 cm x 30 cm. Plant spread was maximum in open pollinated variety IAHS-2 (53 cm) followed by September (41.5 cm) which are to be planted at a wider spacing. IAHS-2 and September had the longest leaves while Pride of India, the smallest leaves. In general  $F_1$  hybrids had less vegetative growth and are compact. Among the  $F_1$  hybrids, HOE-786 from Hoechst Pharma Pvt.Ltd. had minimum height and spread of plant and the leaf size was also the lowest. In cabbage, the edible part, head, is formed by folding and rosetting of leaves. At the time of harvest, Pusa Synthetic retained maximum number of opened leaves (13.0) followed by IAHS-2.

Out of the 16 cabbage genotypes, the  $F_1$  hybrid H-143 from Maharashtra Hybrid Seed Co. Ltd., Jalna had maximum weight of head (1.4 kg) followed by the O.P. variety September (Table 2).  $F_1$  hybrids BRG-5 and H-10 also had medium to large sized heads. September, though ranked only second in weight of head, yielded maximum ( $43.07\text{ t ha}^{-1}$ ) because of better establishment under mild subtropical condition. This variety continuously out-yielded all other varieties during the previous years at Ambalavayal (Gopalakrishnan *et al.*, 1994). September is a French introduction and seed production is being taken up at the Horticultural Research Station, TNAU, Vijayanagaram, Ooty which ensures availability of seeds for cultivation.  $F_1$  hybrids H-143, Uttam and Vishesh also had better plot yield (37.35, 25.54, 24.72  $\text{t ha}^{-1}$  respectively). The performance of Golden Acre, a most popular variety in the north Indian plains, was poor under the mild sub-tropical conditions of Kerala hills because of comparatively high temperature. The head formation in the imported Golden Acre was also highly erratic because of poor adaptability.

Head diameter was maximum in September (17.08 cm) followed by H-143, BRG-5 and

Table 1. Plant characters of different cabbage varieties / hybrids at Arabalavayal

Genotype	Source	Height of plant	Spread of plant	Leaf length	Leaf width	opened leaves	leaf scars
		cm				no	
O. P. Varieties							
IAHS-2	Indo American Hybrid Seed Co. Ltd., Bangalore	19.58	53	30.17	26.58	12.67	12.10
September	Hort. Res. Station, TNAU, Vijayanagaram, Ootagmand	23.79	41.50	29.83	26.58	9.84	16.84
Pride of India	National Seeds Corporation, Ootagmand	20.33	40.25	20.81	20.60	8.84	16.00
Golden Acre (imported)	-do-	24.17	33.00	20.22	17.00	3.86	15.50
Golden Acre	-do-	20.42	40.17	21.53	22.45	4.06	13.00
Pusa Muktha	IARI Regl. Stn. Himachal Pradesh	17.17	48.00	25.30	25.03	8.50	10.50
Pusa Synthetic	-do-	20.82	37.00	20.70	22.00	13.00	15.00
Autumn Giant	-do-	22.33	42.83	20.39	20.92	10.34	16.33
F <sub>1</sub> Hybrids							
HOE 786	Hochest Pharma	17.08	27.67	21.58	21.41	3.99	14.83
H-10	National Seeds Corporation, Ootagmand	23.38	34.50	25.58	23.49	9.99	15.83
H-143	Maharashtra Hybrid Company Pvt. Ltd., Jalna, Maharashtra	22.58	50.00	28.33	30.75	9.00	13.17
H-44	IARI, Katrain	21.14	33.50	22.40	20.52	9.50	18.00
H-54	-do-	25.33	39.50	28.23	26.63	11.16	14.17
BRG-5	-do-	18.67	49.33	26.67	21.90	7.66	11.50
Vishesh	Hindustan Lever Pvt. Ltd.	19.00	33.50	22.50	23.58	4.13	14.34
Uttam	-do-	16.02	32.50	22.33	23.58	8.00	11.50
CD (0.05)		5.83	4.90	2.55	2.75	2.47	NS

Vishesh. Varieties IAHS-2, Pusa Muktha, September and F<sub>1</sub> hybrids HOE-786, H-143 and BRG-5 had flat round heads while H-10 and Uttam had exactly spherical heads. Though treated as round headed varieties, in Golden Acre, Pride of India, Pusa Synthetic, Autumn Giant and H-44 the height of head was slightly more than the diameter.

In cabbage, quality is a factor of leaf thickness and solidness. The ratio of weight and volume of head, indicative of solidness was maximum in Uttam(1.92) followed by Golden Acre. IAHS-2, Pride of India, Pusa Synthetic, H-10, H-143, H-44 and BRG-5 also had tight heads.

September and Vishesh had heads of medium tightness.

Varieties like Pusa Muktha, Golden Acre, IAHS-2 and F<sub>1</sub> hybrid BRG-5, having thin leaves, exhibited tendency for breakage when harvesting was delayed for a few days. Pusa Muktha had blistered leaves while all other varieties had smooth and plain leaves.

Out of the 16 genotypes of cabbage, September was proved to be the most adaptable variety to the mild subtropical climatic condition in the hills of Kerala, the F<sub>1</sub> hybrids H-143, Uttam, Vishesh and HOE-786 performing well.

Table 2. Head characters of different cabbage varieties / hybrids at Ambalavayal

Genotype	Head characters			Yield t ha <sup>-1</sup>	Height / diameter	Volume cm <sup>3</sup>	Solidness weight / vol.
	Weight, g	Diameter, cm	Height, cm				
<b>O. P. Varieties</b>							
IAHS-2	972.5	13.91	11.66	14.42	0.84	1092	0.89
September	1186	17.08	13.42	43.07	0.79	1856	0.63
Pride of India	387.5	9.36	10.16	7.00	1.09	487	0.80
Golden Acre (imported)	398.0	9.66	10.50	5.05	1.09	536	0.74
Golden Acre	787	9.86	12.36	5.92	1.25	718	1.09
Pusa Muktha	467.5	11.63	10.52	8.73	0.90	711	0.66
Pusa Synthetic	487.5	9.25	10.50	4.22	1.14	504	0.97
Autumn Giant	540.5	10.20	11.33	13.69	1.10	653	0.83
<b>F<sub>1</sub> Hybrids</b>							
HOE 786	810.5	14.66	11.16	18.34	0.76	1124	0.72
H-10	985	13.12	13.25	11.84	1.00	1199	0.82
H-143	1396.5	16.5	12.34	37.35	0.75	1569	0.89
H-44	593.0	10.1	11.00	10.66	1.09	615	0.96
H-54	649.5	14.04	13.25	12.12	0.94	1329	0.49
BRG-5	1158.0	15.69	10.82	19.43	6.69	1217	0.95
Vishesh	791.0	15.09	11.42	24.72	0.76	1217	0.64
Uttam	618	8.50	8.50	25.44	1.00	322	1.92
CD (0.05)	122.4	1.22	1.02	6.88	-	-	-

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