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Research Note :

EFFECT OF DIFFERENT SPACING ON GROWTH, YIELD AND ECONOMICS OF CABBAGE UNDER NORTH GUJARAT CONDITION

Shiv Prakash, C. M. Thakor, B.R. Morwal* and M.L. Jat

Department of Horticulture, C. P. College of Agriculture, Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar (Gujarat)

**E-mail: morwalhorti@gmail.com*

ABSTRACT : A field experiment was carried out during rabi season 2010-11 to study the "effect of different spacings on growth, yield and economics of cabbage (*Brassica oleracea var. capitata*). The results revealed that significantly highest number of leaves (11.99), plant spread (56.43 cm) in North-South and (56.77 cm) in East–West, minimum days taken to first harvest after transplanting (92.25 days), maximum head diameter (14.23 cm) and average weight of head (0.80 kg) were recorded with plant spacing of 60 cm x 45 cm. Highest per cent of plant stands (77.02 %) was obtained with plant spacing of 45 cm x 45 cm. Maximum head yield per plot (25.00 kg) and per hectare (27777 kg) and fodder yield ha^{-1} (24194 kg) with maximum net realization of ₹ 171862 were obtained under plant spacing 30 cm x 30 cm.

Keywords : *Cabbage, spacing, growth, yield.*

Cabbage (*Brassica oleracea var. capitata*), belonging to family Cruciferi, is the most important cole crop in India. Cabbage is popular salad crop and also widely used as a cooked vegetable, in pizza and many other additional dishes, like soups, pickles and boiled vegetable. In India, Madhya Pradesh, Bihar, Himachal Pradesh, Maharashtra, Gujarat and hilly areas of Nilgiri in Tamil Nadu are the major cabbage growing states. In Gujarat, cabbage occupies an area about 28204 ha with total head production of about 553559 MT during 2010-11 and Sabarkantha, Banaskantha, Kheda, Junagadh and Rajkot are the major cabbage growing districts in Gujarat where area under cabbage crop is gradually increasing day by day.

An experimental was conducted during rabi season of 2010-2011 at Horticulture Instructional Farm, C. P. College of Agriculture, S. D. Agricultural University, Sardarkrushinagar. Treatments comprised of four levels of spacing viz., S_1 (30 cm x 30 cm), S_2 (45 cm x 30 cm), S_3 (45 cm x 45 cm) and S_4 (60 cm x 45 cm) replicated three times in split plot design with dates of planting as main plot treatment and spacing as sub-plot treatment. The soil of experimental plot was sandy loam in texture, low in organic carbon and available nitrogen, medium in available phosphorus and rich in potassium status. Cabbage var. Pride of India was used for present experiment. Data obtained were analyzed statistically as per standard procedure.

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Growth attributes

The results (Table 1) showed that the different spacings exhibited significant variation in all growth attributing characters and maximum number of leaves (11.99) at 30 days, plant spread (56.43 cm) in North-South and (56.77 cm) in East-West, head diameter (14.23 cm), minimum days to first harvest after transplanting (92.25days) and average weight of head (0.80 kg) were recorded with plant spacing of S_4 (60 cm x 45 cm). Maximum per cent of plant stands (77.02%) was observed with treatment S_3 (45 cm x 45 cm) which may be due to increase in general vigour and growth of plant because of greater availability of nutrient, sunlight, moisture and space, due to less number of plants per unit area resulting increased vegetative growth. These findings are in agreement with those of Meena and Paliwal (3), and Kumar and Rawat (2).

Yield attributes and economics

The results indicate significant variation on various yield attributing characters (Table 2) where highest head yield per plot and per hectare (25.00 kg and 27777 kg, respectively), fodder yield (24194 kg/ha), specific gravity of head (1.17) and highest net return (₹ 171862 ha^{-1}) were recorded with treatment S_1 (30 cm x 30 cm) which might be due to maximum

Table 1: Effect of spacing on growth and yield of cabbage.

Treatment	Number of leaves per plant at 30 DAP	Per cent of plant stands	Days taken to first harvest after transplanting	Plant spread (N-S) (cm)	Plant spread (E-W) (cm)	Diameter of head (cm)	Average weight of head (kg)
S_1 =30cm x 30cm	9.78	72.88	93.08	41.12	40.35	10.37	0.43
S_2 =45cm x 30cm	10.64	74.02	92.75	44.97	45.70	12.15	0.58
S_3 =45cm x 45cm	11.47	77.02	92.58	49.86	50.58	12.93	0.65
S_4 =60cm x 45cm	11.99	75.14	92.25	56.43	56.77	14.23	0.80
C.D. (P=0.05)	0.95	NS	NS	2.87	2.87	0.51	0.04
C.V. %	10.35	7.18	4.58	7.09	7.03	8.90	7.20

Table 2: Effect of spacing on yield, quality and economics of cabbage.

Treatment	Head yield (kg/plot)	Head yield (kg/ha)	Fodder yield (kg/ha)	Specific gravity of head	Gross realization (₹ ha^{-1})	Total expenditure (₹ ha^{-1})	Net Realization (₹ ha^{-1})	C : B ratio
30cm x 30cm (S_1)	25.00	27777	24194	1.17				
45cm x 30cm (S_2)	20.15	24876	20958	1.15	234313	62451	171862	3.75
45cm x 45cm (S_3)	17.00	23319	19856	1.12	206371	53192	153179	3.87
60cm x 45cm (S_4)	12.63	19482	15934	1.10	196480	47019	149461	4.17
C.D. (P=0.05)	1.68	2242.36	1855.93	**NS**	163823	43933	119890	3.72
C.V. %	10.69	11.15	10.92	5.63				

number of plant population and higher plant density per unit area conforming to results of Bhat *et al.* (1).

CONCLUSION

Based on the result of the experiment, it can be concluded that for getting potential production and net profit, cabbage should be planted at 30 cm x 30 cm plant spacing under North Gujarat condition.

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