

EFFECT OF DIFFERENT LEVELS OF NITROGEN AND SPACING ON YIELD OF CABBAGE (*BRASSICA OLERACEA* L. VAR. *CAPITATA*)

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Abstract: The experiment was conducted to investigate the effects of nitrogen and plant spacing on and yield of cabbage (*Brassica oleracea* L. var. *capitata*). The cabbage cv. Golden Acre was grown with 3 nitrogen levels (90, 120 and 150kg/ha) and 4 spacing (60x60cm, 60x45cm, 60x30cm and 45x30cm). The weight of untrimmed & trimmed head and yield increased with increase in the rate of N application, and 150 kg N gave significantly higher yield over 90kg and 120 kg N/ha. The narrow spacing 60 cm x 30 cm gave significantly higher yield over wider spacing. The weight of untrimmed and trimmed head was higher in wider spacing i.e. 60x60cm.

Keywords: cabbage, nitrogen, spacings, head

INTRODUCTION

Cabbage (*Brassica oleracea* L. var. *capitata*) is one of the important cole crops grown in India. It is introduced by Portuguese and crop became popular during the British period. It is grown throughout the Rabi season for culinary and dietic purpose. From nutritional point of view it ranks very high as it is rich in vitamin A, thiamin, riboflavin and other minerals. It also contains protein, carbohydrate and vitamin C.

In a cultural schedule for any crop the important aspect is to workout a relationship between plant population and the level of nitrogen application. The nitrogen is considered to be the most important factor for vegetable production. But, its deficiency and improper placement limits production drastically. The maintenance of adequate plant population/unit area is another most important consideration to obtain higher yield. Wider spacing not only leads to excessive vegetative growth without any economics advantage but also accelerates the evaporative loss of water from the bare ground while closer spacing

rapid attainment of ground cover for better inception of solar radiation and hence, increase photosynthetic ability of crop. The main object of the study was to find out the proper plant spacing and nitrogen level.

MATERIAL AND METHOD

The field experiment was conducted at Agricultural Research Station, Banswara (Rajasthan) during 2009 and 2010. The cabbage was grown with 3 nitrogen levels (90, 120 and 150kg/ha) and 4 spacing (60x60cm, 60x45cm, 60x30cm and 45x30cm) in factorial randomized block design. Six week old seedlings of cv. Golden Acre were transplanted on ridges as per plant spacing treatments. The nitrogen of different levels were applied in two split doses through DAP and urea, while phosphorus and potassium were applied in single doses well before transplantation. The experimental data were statistically analysis of variance and test of significance through the procedure appropriate to the Randomized Block Design describe by Fisher (1950).

Table 1. Effect of different levels of nitrogen and spacing.

Treatment	Weight of un-trimmed head(g)			Weight of trimmed head (g)			Yield (q/ha)		
	2009	2010	Mean	2009	2010	Mean	2009	2010	Mean
Nitrogen level									
N ₀	713.75	706.59	710.17	493.75	489.87	491.81	198.00	195.30	196.65
N ₁	851.00	844.17	847.59	575.00	569.96	572.48	230.75	228.82	229.79
N ₂	982.50	975.51	979.01	662.50	656.67	659.59	262.50	259.72	261.11
Sem ±	8.91	10.00	-	9.91	9.88	-	9.91	10.01	-
CD 5%	26.66	29.33	-	29.07	28.98	-	29.07	29.36	-
Spacing									
S ₀	1005.33	998.67	1002	733.33	728.29	730.81	203.00	200.81	201.91
S ₁	905.33	897.67	901.50	633.33	627.63	630.48	210.67	208.48	209.58
S ₂	822.00	815.01	818.51	550.00	545.54	547.77	274.00	271.81	272.91
S ₃	663.67	657.01	660.34	391.67	387.21	389.44	234.00	230.68	232.34
Sem ±	10.44	11.55	-	11.44	11.41	-	11.44	11.56	-
CD 5%	31.56	33.87	-	33.56	33.47	-	33.56	33.92	-

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Effect of Nitrogen

The data in Table:1 revealed that the increase the nitrogen level resulted in increasing the weight of un-trimmed and trimmed head. The maximum mean un-trimmed head weight 979.01 g and trimmed head weight 659.59 g was observed under N_2 (150kgN/ha) level, which was found significantly higher than N_0 and N_1 nitrogen level. The mean yield 261.11q/ha was also reported in N_2 (150kgN/ha). The increase weight of un-trimmed, trimmed head and yield/ha that nitrogen being essential part of nucleic acid and have synthesized more plant metabolites, which ultimately might have increase head weight and plant yield. Kumar and Rawat (2002) and Prabhakar and Srinivas (1993) also reported highest yield with 150kgN/ha in cabbage.

Effect of Spacing

The data perusal in Table:1 that increase the weight of un-trimmed and trimmed head with increasing plant spacing. The maximum mean un-trimmed head weight 1002.00 g and trimmed head weight 730.81 g was recorded in 60x60cm spacing, which was significantly higher than other plant spacing. Increase the weight of un-trimmed and trimmed head in wider spacing due to availability of more nutrients in plants. Stofella and Fleming (1988) also found that decrease plant population increased the shoots weight in cabbage. The maximum mean yield was reported in close spacing (45x30cm) i.e. 272.91q/ha, which was significantly higher than other plant spacing. The significantly increase in yield under closer spacing might be due to the fact that there were more number of plants per unit under closer

spacing, which ultimately increased the yield per hectare. Similar results were also reported by Lal (1996) and Mallik and Bhattacharya (1996) in cabbage.

CONCLUSION

On the basis of present investigation it can be concluded that under the agro-climatic conditions of zone IVA, the highest yield of cabbage Cv. Golden Acre could be obtained by application of 150 kg N/ha with 45x30cm plant spacing.

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