

EFFECT OF BORON APPLICATION ON THE YIELD OF DIFFERENT VARIETIES OF BROCCOLI IN HILL VALLEY

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Broccoli (*Brassica oleracea* var. *Brotrytis* L. *Cymosa* Lam.) is vitamin rich winter vegetable. It is fairly rich in carotene and ascorbic acid and contains appreciate quantities of thiamin, riboflavin, niacin and iron (Thomson and Kelly, 1985; Rahman, 1988). Broccoli is environmentally better adapted and can tolerate comparatively high temperature than cauliflower (Rashid, 1993). Unlike cauliflower, broccoli produces smaller flowering shoot from the leaf axile if the main apical flower bud is removed. Consequently a field of broccoli may be harvested over a considerable period of time. Boron deficiency is now widespread in Bangladesh. This element deficiency causes many anatomical, physiological and biological changes. Hollow stem disorder is a major problem for broccoli production and is commonly associated with B deficiency (Shelp, 1992; Rahman *et al.*, 1995). The present investigation was undertaken to find out the response of three broccoli varieties to different levels of boron in the Chittagong hilly region.

The experiment was conducted at the Hill Agricultural Research Station (HARS), Khagrachari during September 2002 to March 2003. The trial was made in randomized complete block design with three replications. The treatment consisted of three broccoli varieties, viz., Green Comet, Green King and Green Harmony with three levels of boron viz., Control (0.0 kg/ha), 1.0 kg/ha and 2.0 kg/ha. Plot dimension was 4.0x2.0 m with the crop spacing of 60x50 cm Boron was applied as solubor (20% B). Manure and fertilizers were applied at the rate of 101 cowdung, 200 kg urea, 150 kg TSP and 200 kg MP/ha. Cowdung and TSP were applied in pit and urea and MP were applied in three equal installments at 15, 30 and 45 days after transplanting. Solubor was applied in row at the time of final land preparation. Thirty days old seedlings were transplanted on 6 October 2002. Irrigation, weeding and other intercultural operations were done as and when necessary. Harvesting was started on 19 December 2002 and continued upto 5 March 2003. Data on different parameters were recorded from randomly selected five plants in each plot and analyzed statistically. The parameters under study included plant height, outer leaves/plant, curd weight/plant, side curd

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weight/plant and curd yield. There was a significant and positive effect of boron application on the yield of the crop and 1.0 kg B/ha was found to be an optimum rate. The 1.0 kg B/ha rate produced the highest yield (512.3g/plant) followed by 2.0 kg B/ha showing 508.5 g/plant and the B control did the lowest (445.4g/plant). All other characters remained unaffected by B application. However, the application of B at 1.0 kg/ha had the height curd weight (294.6 g) and 2.0 kg B showed the next result (270.2g). Similar effect was noticed in case of yield. For other characters the variations between B treatments was narrow. Concerning varietal effect, curd weight as well as yield per plant significantly varied with different varieties, however, Green Harmony performed the highest result (606.2g/plant) and the other two varieties showed statistically similar result (440.8 and 425.2 g /plant for 2 and 0 kg B/ha, respectively) (Table 1). Curd yield also showed similar result. The other three plant characters did not vary with varieties, in value the Green Harmony had higher result particularly in respect of outer leaves and side curd weight per plant.

Table 1. Main effect of boron on the growth and yield of different broccoli varieties.

Treatments	Plant height (cm)	Outer leaves/plant	Curd wt /plant (g)	Side curd wt./plant (g)	Yield/ plant (g)	Curd yield (t/ha)
Boron						
Control	63.3	14.8	240.2	236.1	445.4	12.5
1.0 kg/ha	62.5	14.3	294.6	223.7	518.3	14.5
2.0 kg/ha	62.5	13.5	270.2	231.6	508.5	14.2
LSD (0.05)	ns	ns	ns	ns	52.9	1.5
Variety						
Green. Commet	61.5	13.5	210.7	207.8	425.2	11.9
Green. King	63.8	12.6	223.6	214.5	440.8	12.3
Green. Harmony	62.9	16.3	370.5	235.7	606.2	16.5

The interaction effect between variety and boron was significant in respect of curd weight and yield per plant (Table 2). It appears that the B effect was significant for Green Harmony, but not with the other two varieties. For every B treatment, the Green Harmony had higher curd yield and the other two varieties produced identical curd yield. There was no significant interaction between variety and boron for the other characters under study. The results revealed that

variety Green Harmony with 1.0 kg/ha boron is adequate for broccoli production in the hilly area.

Table 2. Interaction effect of boron on the growth and yield of different broccoli varieties.

Treatments	Plant height (cm)	Outer leaves/plant	Curd wt/plant (g)	Side curd wt/plant (g)	Yield/plant (g)	Curd yield (t/ha)
<u>Green Ccommet</u>						
0.0 kg/ha	61.9	13.4	20.8.8	200.3	408.9	11.4
1.0 kg/ha	59.8	13.7	217.3	208.0	425.3	11.9
2.0 kg/ha	62.8	13.3	206.0	215.3	441.5	12.6
<u>Green King</u>						
0.0 kg/ha	64.1	13.0	197.3	179.7	400.7	11.2
1.0 kg/ha	65.5	13.1	242.0	211.7	435.0	12.7
2.0 kg/ha	62.2	11.8	231.6	237.0	468.7	13.1
<u>Green Harmony</u>						
0.0 kg/ha	63.9	17.6	314.0	212.2	526.5	14.7
1 .0 kg/ha	62.2	16.0	424.0	252.3	676.6	18.9
2.0 kg/ha	62.7	15.4	372.0	242.7	615.5	17.2
LSD (0.05)	ns	ns	98.1	ns	91.6	2.56

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