

Short communication

Effect of seeds and seedlings soaking in borax solution on cauliflower (*Brassica oleracea* var. *Botrytis* L.)

KP Singh, Kamalkant, VK Singh and RK Roy

Received : Dec 2008 / Accepted : Dec 2010

Cauliflower (*Brassica Oleracea* var. *Botrytis* L.) is an important vegetable crop of Chotanagpur (Jharkhand) plateau and due to mild favourable temperature prevailing throughout the year. Though, temperature is suitable for cauliflower cultivation, soil fertility is not as good as compared to plains of the state. Due to low organic matter natural Boron content of the soil is subjected to leaching besides continuous cropping of cauliflower also caused depletion of Boron content. Soil application of Boron may not be suitable due to leaching and soil factors. Soaking of seeds and seedlings dipping in borax solution may meet the requirement of Boron to some extent and initial availability in early stage may produce better early standard growth resulting in higher curd yield. Keeping all the above facts under consideration, present experiment was planned and laid out.

A field experiment was conducted at Horticultural Research Farm, Birsa Agricultural University, Kanke, Ranchi during two kharif seasons between 2002-04 on a well drained loamy soil. The experiment was laid out in randomized block design with three replications, consisting of 6 levels of Boron (0.25, 0.50, 1.0, 1.50, 2.0 and 2.50% and control) for seed soaking and seedling dipping making a total of 14 treatments. Five weeks old seedlings of variety "Early Kunwari" were transplanted in plot size of 4.20 x 2.10 m at spacing of 60 x 30 cm in both the years. Soaking of seeds and seedlings dipping were done for 12 hours. Distilled water was used for preparation of borax solution. After soaking of seeds, they were dried in shade to remove excess water to facilitate sowing of seeds in nursery. For dipping of seedling, the basal portion of seedlings roots about 2.5 - 3.0 cm. was dipped in prepared borax solution. They were kept in shade to drain excess water of solution. The crop was fertilized with 100 kg N, 60 kg P₂O₅ and 50 kg K₂O/ha. Plant protection measures and other cultural practices were done as per need of the crop. The observations related to growth and yield characters were recorded.

Statistical analysis of the data indicated that either by seed treatment or by seedling dipping of cauliflower in all the concentrations of borax solution, significantly enhanced its plant height, plant spread (E-W & N-S), number of leaves/ plant, leaf area and girth of plant over control. The data presented in Table 1 showed that the increasing levels of borax from 0.25% to 1.50% either as seed treatment or as seedling dipping exhibited linear increase in their growth parameters. Further increase in borax concentration showed no marked effect on these characters during both the years. However, the highest increase in growth parameters was recorded with the application of Boron at 1.50%. The increase in morphological characters due to Boron application is

KP Singh, Kamalkant, VK Singh and RK Roy
Department of Horticulture,
Bihar Agricultural College,
Sabour, Bhagalpur,
Bihar 813 210 (INDIA)
Email : ddcarwalbih@nic.in

Table 1: Effect of seeds and seedlings treatments with borax solution on growth as well as reproductive characters of Cauliflower.

Treatments	Plant Height (cm.)	Plant Spread (cm.)	No. of leaves	Leaf area (cm.)	Girth of Plant (cm.)	Weight of Plant (g.)	Weight of curd (g.)	Diameter of curd (cm.)	Depth of curd (cm.)	Yield (q/ha.)
T ₁ - Water soaking of seeds	41.82	41.20	11.42	310.40	2.37	568.57	360.75	21.85	8.38	182.81
T ₂ -0.25% borax solution	47.45	44.92	12.75	350.00	2.60	693.45	415.44	25.10	8.92	210.04
T ₃ - 0.50% borax solution	43.47	47.49	13.30	375.20	2.73	769.94	444.80	27.48	9.31	224.87
T ₄ - 1.00 % borax solution	54.47	48.95	13.65	387.00	2.84	854.42	466.91	29.12	9.58	236.62
T ₅ -1.50 % borax solution	57.71	52.08	14.20	410.10	2.94	924.53	483.99	30.70	9.82	244.68
T ₆ - 2.00 % borax solution	53.46	48.34	12.50	380.20	2.77	825.89	426.87	28.38	9.28	215.81
T ₇ -2.5 % borax solution	48.98	44.09	11.55	330.20	2.54	836.63	394.78	26.20	7.42	199.10
T ₈ - water soaking of seedlings	41.10	39.99	10.86	300.30	2.30	541.44	345.28	20.60	8.15	174.56
T ₉ -0.25% borax solution	45.86	43.05	12.22	340.30	2.49	671.82	394.41	24.10	8.61	198.92
T ₁₀ - 0.50% borax solution	49.07	45.81	12.52	365.40	2.70	728.34	402.97	26.88	8.79	211.57
T ₁₁ - 1.00 % borax solution	53.63	49.73	13.33	380.50	2.77	827.87	435.34	28.39	9.05	220.06
T ₁₂ -1.50 % borax solution	56.00	53.30	13.89	402.60	2.89	903.52	462.53	30.45	9.50	233.93
T ₁₃ - 2.00 % borax solution	52.95	49.50	12.42	370.10	2.74	804.65	421.48	28.22	8.97	211.18
T ₁₄ -2.5 % borax solution	45.61	42.22	11.35	315.00	2.52	728.17	381.59	24.95	7.21	192.92
C.D. at 5%	3.54	3.36	0.81	26.86	0.16	66.76	26.16	1.86	0.56	16.55
C.V.	5.96	6.10	5.76	7.23	6.27	8.41	6.30	7.04	5.67	8.14

reported to be effected by the activity of enzymes leading to greater synthesis of lignin and protein (Takkar and Randhawa, 1978).

Weight of plant, shoot and root also increased significantly in case of all the concentrations of Boron over control. However, most perceptible increase was observed due to seed treatment and seedlings dipping in 1.50% borax solution. The increase in weight of plant and shoot could be attributed to more number of leaves and bigger leaf size, which might have led to enhanced photosynthetic activities.

Further, an increasing trend in diameter, weight, depth and yield of curd too was recorded with the increase in Boron concentrations upto 1.50%. Further increase in concentration of Borax solution even at 2.0 % did not

produce corresponding increase in these growth parameters. The increase in curd yield can be attributed to better root proliferation, consequently higher uptake of nutrients and water, more photosynthesis which enhanced food accumulation in edible parts.

References

- Kumar Sanjay, Choudhary DR (2002) Effect of FYM, Molybdenum and Boron application on yield attributes and yield of Cauliflower. *Crop Research Hisar* 24 (3): 494-496
- Pizetta LC, Ferreira ME, Cruz MCP da, Barbosa J C (2005) Response of Boron fertilization on broccoli cauliflower and cabbage planted in sandy soil. *Horticultura Brasileira* 23 (1): 51-56
- Takkar PN, Randhawa NS (1978) Micronutrients in Indian Agriculture. *Fertil News* 23: 13-26