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HORTICULTURE | ORIGINAL ARTICLE

Effects of Varieties and Different Micronutrients on Growth and Yield of Broccoli (*Brassica oleracea* var. *italica*)

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ABSTRACT

An experiment was conducted at the Horticulture Farm of Bangladesh Agricultural University, Mymensingh, during the period of November 2021 to February 2022. The experiment consisted of two factors, such as factor A: three varieties of broccoli i.e. V_1: Early You, V_2: Barbara, V_3: Green Crown and factor B: four levels of micronutrients i.e. T_0: control, T_1: Boron @ 3 kg/ha, T_2: Zinc @ 2 kg/ha, T_3: Boron + Zinc @ (3+2) kg/ha. The two-factor experiment was laid out in Randomized Complete Block Design with three replications. Variety and micronutrients influenced significantly on most of the parameters under the study. In case of variety, the highest curd yield (13.35 t/ha) was found from V_3 (Green Crown) and the lowest curd yield (11.12 t/ha) was found from V_1 (Early You). V_2 (Barbara) showed higher dry matter content of broccoli curd, which is 15.72%. On the other hand, V_1 (Early You) showed lower dry matter content, which is 13.34%. For micronutrients, T_3 (Boron +Zinc @3+2 kg/ha) performed the highest in respect of curd yield (19.37 t/ha) and the lowest (6.32 t/ha) was from T_0 (control). T_3 (Boron+Zinc @3+2kg/ha) showed higher dry matter content (13.01%), whereas T_0 (control) showed the least (11.02%). For combined treatment, the highest curd yield (21.61t/ha) was obtained from V_3T_3 (Green Crown and Boron +Zinc @ 3+2 kg/ha micronutrient dose) and the lowest curd yield (5.23 t/ha) from V_0T_0 (Early You and control). V_2T_3 (Boron+ Zinc @3+2 kg/ha with Barbara variety) produced the highest dry matter content of curd, which is 17.34%. On the other hand, the lowest dry matter content of broccoli curd is provided by V_1T_0 (Early You variety with control) treatment combination which is 12.49%. Therefore, it can be concluded that V_3 (Green Crown) along with Boron+Zinc @ 3+2 kg/ha and V_2 (Barbara) along with Boron+Zinc @ 3+2 kg/ha were found to be the best in respect of yield and dry matter content of broccoli, respectively, compared to other treatments

1. Introduction

Broccoli (*Brassica oleracea* var. *italica*) is an important vegetable crop and has high nutritional and good commercial value (Yoldas *et al.,* 2008). It is one of the foremost widely grown vegetables that is consumed mostly all over the world, highlighted mainly for its nutritional value as a source of assorted compounds, like vitamins, minerals, antioxidants, moreover as its anticancer properties (Umar *et al.,* 2013). In terms of nutrition, it is high in vitamin A (2500 I.U.), 113 mg of vitamin C, protein (3.6 g), 5.9 g of carbs, as well as minerals such as iron (1.1 mg), phosphorus (103 mg), and calcium 78 mg, 382 mg, and 15 mg of sodium 100 grams of edible portion containing mg (Rana, 2008). The edible portion of the broccoli plant consists of a tender stem and unopened flower buds. The plants form a sort of head consisting of green buds and thick fleshy stalks. The terminal head is rather loose, and green in color and also the flower stalks are longer than cauliflower (Bose *et al*., 2002). It may be harvested for a good period of time than cauliflower (Thompson and Kelly, 1988). Unlike cauliflower, broccoli produces smaller flowering shoots (secondary curds) from the leaf axils after harvest of main apical curds which are edible.

In 2019, global production of broccoli (combined for production reports with cauliflowers) was 27 million tons, with China and India together accounting for 73% of the world total. Secondary producers, each having about one million tons or less annually, were the United States, Spain, and Mexico. In the United States, broccoli is grown year-round in California which produced 92% of the crop nationally with 95% of the total crop produced for fresh

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sales in 2018. Broccoli cannot be harvested using machines, meaning it must be hand-harvested.

The average yield of broccoli is low in Bangladesh compared to other countries of the world and therefore the low yield however isn't a sign of low-yielding potentiality of this crop. However, low yield is also attributed to variety of reasons viz. unavailability of quality seeds of high yielding varieties, fertilizer management, disease and bug infestation and improper or limited irrigation facilities. Among various factors variety and micronutrients can play a crucial role for increasing the production of broccoli in Bangladesh. Deficiency of soil nutrient is now considered united of the most important constraints to successful upland crop production in Bangladesh (Islam and Noor, 1982). Previous research has indicated that nutrients have important effects on broccolis productivity and quality (Belec *et al*., 2001; Moniruzzaman *et al.,* 2007; Ambrosini *et al.,* 2015).

Micronutrients play an important role in broccoli production. Among the microelements, B and Zn play an important role directly and indirectly in improving the growth, yield and quality of broccoli in addition to checking various diseases and physiological disorders. Zinc (Zn) is responsible for many important physiological functions and is an essential nutrient for carbon metabolism in plant. Zinc is also involved in auxin productions. Under Zn deficiency, plasma membranes lose their integrity. B is one of the most widely applied micronutrients. It has different role in plants metabolic activities. Cell division, nitrogen and carbohydrate metabolism and water relation in plant are controlled by B. In its absence, nutritional disorders in vegetables like hollow stem occurs in cauliflower and broccoli (Shelp, 1990). In Cole crops like cauliflower and broccoli, boron requirement is high (Mengal and Kirkby, 1987).

Plant nutrition is one of the prime considerations for getting higher yield of any crop. Mineral fertilizer improves growth and yield of broccoli due to the role of nitrogen, phosphorus, and potassium on the meristematic activity. Boron and molybdenum are essential micronutrients required for normal plant growth and development. Plants differ widely in their requirements, but the ranges of deficiency and toxicity are narrow. Boron and molybdenum deficiencies are very common in cole crops. Deficiency causes many anatomical, physiological, and biological changes. The deficiency of boron and molybdenum has threatened the ever-increasing areas of broccoli. The effected heads become irregular in shape, smaller in size and bitter in taste, which adversely affects the market demand of the crop. Very limited works have been done on the varieties and micronutrients in relation to growth and yield of broccoli. Therefore, the current investigation was conducted to study the effects of varieties and micronutrient treatments on growth and yield of broccoli.

2. Materials and Methods

2.1. Experimental location, climate and soil

The field experiment was conducted at the Landscape Section of the Department of Horticulture, Bangladesh Agricultural University, Mymensingh during the period of November 2021 to February 2022 to determine the effects of varieties and micronutrient treatments on growth and yield of broccoli. The experimental area was under the subtropical climate, which is characterized by heavy rainfall, high humidity, high temperature and relatively long day during *Kharif* season (April to September) and hardly rainfall, low temperature and short day period during the *Rabi* season (October to March). Plenty of sunshine and moderately low temperature prevails during the Rabi season, which are suitable for the growing of Broccoli in Bangladesh. The soil of the experimental plot was silty loam in texture and belonging to the Old Brahmaputra Flood Plain under AEZ-9.

2.2. Plant materials

The seeds of broccoli of three varieties such as Early You, Barbara and Green Crown were used as planting materials for this experiment. The seed of broccoli were collected from Notun Bazar seed market, Mymensingh.

2.3. Raising of seedlings

The seedlings were raised at the Horticultural Farm, BAU, Mymensingh, under special care in a 3 m × 1 m size seedbed. The soil of the seedbed was well ploughed with a spade and prepared into loose friable dried masses and to obtain good tilth to provide a favorable condition for the vigorous growth of young seedlings. Weeds, stubbles and dead roots of the previous crop were removed. The seedbed was dried in the sun to destroy the soil insect and protect the young seedlings from the attack of damping off disease. To control damping off disease Cupravit fungicide were applied. Decomposed cowdung was applied to the prepared seedbed at the rate of 10 t/ha. Ten (10) grams of seeds were sown in seedbed. After sowing, the seeds were covered with the finished light soil. At the end of germination shading was done by Banana leaves over the seedbed to protect the young seedlings from scorching sunshine and heavy rainfall. Light watering, weeding was done as and when necessary to provide seedlings with ideal condition for growth.

2.4. Treatments of the experiment

The two-factor experiment consisted of three broccoli varieties *viz.,* V_1: Early You, V_2: Barbara, V_3: Green Crown and factor B: four levels of micronutrients i.e. T_0: control, T_1: Boron @ 3 kg/ha, T_2: Zinc @ 2 kg/ha, T_3: Boron + Zinc @ (3+2) kg/ha).

2.5. Design and layout of the experiment

The two-factor experiment was laid out in Randomized Complete Block Design (RCBD) with three replications. The total area of the experimental plot was 106.37 m^2 with length 18.5 m and width 5.75 m which were divided into three equal blocks. Each block was divided into 12 plots where 12 treatments combination allotted at random. There were 36 unit plots and the size of each plot was 1 m × 1.25 m. The distance between two blocks and two plots were 0.5 m.

2.6. Land preparation

The selected plot of the experiment was opened in November 2021 with a power tiller, and left exposed to the sun for a week. Subsequently cross ploughing was done five times with a country plough followed by laddering to make the land suitable for transplanting the seedlings. All weeds, stubbles and residues were eliminated from the field. Finally, a good tilth was achieved. The soil was treated with insecticides (Furadan 3G @ 4 kg/ha) at the time of final land preparation to protect young plants from the attack of soil inhibiting insects such as cutworm and mole cricket.

2.7. Application of manures and fertilizers

Urea, TSP, MoP, Gypsum were used as the fertilizer sources of nutrient elements N, P, K, S, respectively. A standard dose of NPKS @ 120, 100, 150, 20 kg/ha were used in all treatments. The total amount of cowdung, TSP and Gypsum was applied as basal dose at the time of land preparation. The total amount of urea and MoP was applied in three equal installments at 15, 30 and 45 day after transplanting.

2.8. Collection, preparation and application of micronutrients

Zinc as Zinc sulphate, Boron as boric acid were collected from local market. Total 110.97 g zinc were applied in 18 zinc treated plot, whereas 57.15 g B were applied in 18 Boron treated plot as basal dose.

2.9. Transplanting of seedlings

Healthy and uniform seedlings of 20 days old were transplanted in the experimental plots on November 22, 2021. The seedlings were uprooted carefully from the seedbed to avoid damage to the root system. To minimize the damage to the roots of seedlings, the seedbeds were watered one hour before uprooting the seedlings. Transplanting was done in the afternoon. The seedlings were watered immediately after transplanting. Seedlings were sown in the plot with maintaining distance between row to row was 50 cm and plant to plant was 40 cm. As a result, there are 9 seedlings were accommodated in each plot according to the design of the plot size at 1 m × 1.25 m. The young transplanted seedlings were shaded by banana leaf sheath during day to protect them from scorching sunshine up to 7 days until they were set in the soil. They (transplants) were kept open at night to allow them receiving dew. A number of seedlings were also planted in the border of the experimental plots for gap filling.

2.10. Intercultural operations

After transplanting the seedlings, various intercultural operations such as gap filling, weeding, earthing up, irrigation, pest and disease control etc. were accomplished for better growth and development of the broccoli seedlings.The young seedlings in the field were irrigated just after transplanting. Irrigation was provided by a watering can and/or hose pump when needed throughout the growing time mainly after top dressing and after weeding. At this time care was taken so that irrigated water not pass from one plot to another. During the time of irrigation, the soil was made saturated with water. After rainfall excess water was drained when necessary. The transplanted seedlings were watered up to 7 days for the well establishment of the seedlings in the soil. The experimental plots were regularly observed to find out any damage and dead seedlings for replacement. Gap filling was done whenever required. Very few seedlings were damaged after transplanting and such seedlings were replaced by new seedlings from the border plants kept for this purpose. The transplants were given shading and watering for 7 days for their proper establishment. The hand weeding was done 15, 30 and 45, 60 days after transplanting to keep the plots free from weeds. Earthing up was done at 20 and 40 days after transplanting on both sides of rows by taking the soil from the space between the rows by a small spade. Insect infestation was a serious problem during the period of establishment of seedling in the field. In spite of Furadan 3G applications during final land preparation, few young plants were damaged due to attack of mole cricket and cut worm. Cutworms were controlled both mechanically and spraying Darsban 29 EC @3%. Some plants were infected by *Alternaria* leaf spot diseases caused by *Alternaria brassicae*. To prevent the spread of the disease Rovral @ 2 g per liter of water was sprayed in the field. The diseased leaves were also collected from the infested plant and removed from the field. Birds pest such as nightingales (common name: Bulbuli) were seen visiting the broccoli field very frequently. The nightingale visited the fields in the morning and afternoon. The birds found to puncture the newly initiated curd and were controlled by striking a kerosene tin of metallic container frequently during daytime.

2.11. Harvesting

Harvesting of the broccoli was not possible on a certain or particular date because the curd initiation as well as curd at marketable size in different plants were not uniform. Only the marketable size curds were harvested with fleshy stalk by using as sharp knife. Before harvesting of the broccoli curd, compactness of the curd was tested by pressing with thumbs.

2.12. Data collection

Four plants were randomly selected from the middle rows of each unit plot for avoiding border effect, except yields of curds, which was recorded plot wise. Data were recorded on the parameters such plant height, length of

largest leaf, breadth of largest leaf, number of leaves per plant, length of largest leaf, diameter of curd, primary curd weight (g), yield per hectare (t). The plant height was measured at 30, 40, 50, and 60 days after transplanting (DAT) from each of the plots by using a meter scale. The measurement was taken from the ground level to the tip of the largest leaf of an individual plant. Mean value of the five selected plants was calculated for each unit plot and expressed in centimetre (cm). The number of leaves per plant was counted excluding the small leaves, which were produced by auxiliary shoots. The fallen leaves were counted on the basis of scar marks on the stern introduced by the petiole of the leaves. The distance from the base of the petiole to the tip of leaf was considered as length of leaf. It was measured with a meter scale and was recorded in centimetre (cm). The breadth of largest leaf is measured with a meter scale and recorded in centimetre (cm). The primary weight of curd per plant was recorded in gram (g) by a beam balance. At first the selected plant was pulled out, then the curd was cut with a sharp knife and it was weighted in a beam balance. The diameter of curd at harvest was recorded in centimetre (cm) with the help of meter scale and mean was recorded. The yield per unit plot was calculated by adding the yields of all plants of each unit plot and expressed in kilogram (kg). The yield of curd per hectare was calculated by conversion of the curd weight per plot yield data to per hectare and recorded in ton (t).

2.13. Statistical analysis

The data obtained for different characters were statistically analyzed to find out the significance of the difference for different micronutrients and variety on growth, yield and quality contributing characters of broccoli. The means of all the treatments were calculated and analyses of variances for all the characters were performed by F variance test. The significance of differences between the pair of treatment means was evaluated by the Least Significant Differences (LSD) test at 5% level of probability (Gomez and Gomez, 1984).

3. Results and Discussion

3.1. Main effect of varieties on growth and yield of broccoli

Results revealed that varieties had significant effects on plant height, number of leaves per plant, length of the largest leaf, breadth of the largest leaf, diameter of curd, primary curd weight and yield per hectare of broccoli. There was significant difference between three varieties of broccoli. The highest plant height (16.57cm), number of leaves per plant (15.60) and length of the largest leaf (42.45 cm) were recorded from the variety Barbara (V_2) at 60 days after transplanting (DAT) while the lowest plant height (14.24 cm), number of leaves per plant (14.72) and length of the largest leaf (40.53cm) were recorded from the variety Early you (V_1) at 60 DAT (Table 1). In case of breadth of the largest leaf highest value (23.34cm) was recorded from V_3 (Green Crown) at 60 DAT and the smallest breadth (19.06) was found from V_2 (Barbara) (Table 1). Barbara variety showed vigorous growth and produced the highest plant height, higher number of leaves and longer leaf than other varieties because of the genotype of the morphological characters of the variety influenced by its genotype. These results are in close conformity with the study carried out by Shelp (1990), Thapa *et al.* (2016) and Tejaswini *et al.* (2018). In case of breadth of the largest leaf highest value (23.34cm) was recorded from V_3 (Green Crown) at 60 DAT and the smallest breadth (19.06) was found from V_2 (Barbara) (Table 1). Green Crown variety had the wider leaf than other varieties in this experiment for its genotypic superiority and morphological characteristics. These results are in close conformity with the study carried out by Nooprom and Santipracha (2013).

The highest curd diameter (12.85cm) was recorded from V_3 (Green Crown) while the smallest curd diameter (11.11cm) was recorded from the variety Barbara (V_2). Again highest primary curd weight (185.48g) was obtained from V_3 (Green Crown) and lowest primary curd weight (154.45g) was produced by the variety Early You (V_1). Green Crown variety produce highest curd diameter and primary curd weight than other varieties because of the genetic influence. These results are in align with the study carried out by Shelp (1990). Yield was also significantly influenced by broccoli cultivars (Table 1). V_3 produced the highest yield per hectare (13.35t), whereas the lowest yield per hectare (17.62 t) was obtained from V_1 (Table 1). Variety had a very beneficial impact on the amount of broccoli curd produced per hectare because of the morphology of it, which is influenced by its genotype.

3.2. Main effect of micronutrient treatment on growth and yield of broccoli

It was found that organic manures had significant influence on all the vegetative and yield contributing characters of broccoli under study (Table 2). The highest plant height (19.43cm), number of leaves per plant (18.58), length of the largest leaf (50.73cm), breadth of the largest leaf (26.38 cm) were recorded when T_3 (B+Zn @ 3+2 kg/ha) was applied whereas the lowest plant height at (11.45cm), number of leaves per plant (12.69), length of the largest leaf (28.66 cm), breadth of the largest leaf (14.76 cm) were recorded from T_0 (control) at 60 DAT (Table 2). Both B and Zn helps plant with cell division, nitrogen metabolism, carbon metabolism, protein formation, auxin metabolism and chlorophyll formation. For this reason, the T_3 showed highest plant height, number of leaves per plant, length of the largest leaf and breadth of the largest leaf than other treatments. These result are in close conformity with the study carried out by Nooprom and Santipracha (2013) and Thapa *et al.* (2016).

Maximum curd diameter (14.15cm) was recorded when T_3 (B+Zn @ 3+2 kg/ha) was applied and the minimum curd diameter (8.85 cm) was recorded from T_0 (control) (Table 2). Application of B and Zn produce the wider curd diameter because B and Zn help plant to higher cell division and horizontal growth. These result are in close conformity with the study carried out by Shelp (1990).

Maximum primary curd weight (266.83 g) and yield per hectare (24.01 t) were recorded at T_3 (B+Zn @ 3+2 kg/ha)

and the minimum individual curd weight (155.50 g) and yield per hectare (13.99 t) were recorded at T_0 (control) (Table 2). Application of micronutrients positively influenced the curd formation because of higher rate of cell division resulting in higher yield. These result are in aligned with the study carried out by Šlosar *et al.* (2017).

Table 1. Main effect of varieties on growth and yield contributing characters of broccoli

Variety	Plant height (cm) at 60 DAT	No. of leaves/ plant at 60 DAT	Largest leaf length (cm) at 60 DAT	Largest leaf breadth (cm) at 60 DAT	Curd diameter (cm)	Primary curd weight (g)	Yield (t/ha)
V_1	14.24	14.72	40.53	20.64	11.19	154.45	11.12
V_2	16.57	15.60	42.45	19.06	11.11	172.55	12.42
V_3	14.58	15.60	41.79	23.34	12.85	185.48	13.35
$LSD_{0.05}$	0.52	0.297	0.572	0.747	0.037	1.001	0.07
Sig. level	*	*	*	*	*	*	*

*= Significant at 5% level of probability. V_1: Early You, V_2: Barbara, V_3: Green Crown

Table 2. Main effect of micronutrient treatment on growth and yield contributing characters of broccoli

Micronutrient treatment	Plant height (cm) at 60 DAT	No. of leaves/ plant at 60 DAT	Largest leaf length (cm) at 60 DAT	Largest leaf breadth (cm) at 60 DAT	Curd diameter (cm)	Primary curd weight (g)	Yield (t/ha)
T_0	11.45	12.69	28.66	14.76	8.85	87.86	6.32
T_1	14.88	15.05	46.01	22.30	12.46	172.27	12.40
T_2	14.76	14.91	40.95	20.62	11.4	154.12	11.09
T_3	19.43	18.58	50.73	26.38	14.15	169.06	19.37
$LSD_{0.05}$	0.60	0.343	0.661	0.863	0.043	1.156	0.08
Sig. level	*	*	*	*	*	*	*

* = Significant at 5% level of probability, Here, T_0: Control, T_1: B @3 kg/ha, T_2: Zn @ 2 kg/ha, T_3: B +Zn @ (3+2) kg/ha.

Table 3. Combined effects of varieties and micronutrient treatment on growth and yield contributing characters of broccoli

Treatment combinations	Plant height (cm) at 60 DAT	No. of leaves/ plant at 60 DAT	Largest leaf length (cm) at 60 DAT	Largest leaf breadth (cm) at 60 DAT	Curd diameter (cm)	Primary curd weight (g)	Yield (t/ha)
V_1T_0	9.33	12.5	23.75	13.36	8.72	72.73	5.23
V_1T_1	16.17	13.5	51.29	22.57	12.14	163.85	11.79
V_1T_2	14.49	14.41	33.62	20.13	11.17	147.65	10.63
V_1T_3	17.00	18.50	53.45	26.52	12.75	233.58	16.81
V_2T_0	11.88	13.08	28.89	13.83	7.93	88.85	6.39
V_2T_1	15.36	15.25	43.02	19.55	12.07	171.65	12.35
V_2T_2	15.49	15.58	46.94	17.14	10.32	156.27	11.25
V_2T_3	23.55	18.50	50.95	25.72	14.12	173.42	19.68
V_3T_0	13.14	12.50	33.35	17.08	9.90	101.98	7.34
V_3T_1	13.11	16.41	43.74	24.78	13.19	181.32	13.05
V_3T_2	14.32	14.75	42.30	24.60	12.71	158.44	11.40
V_3T_3	17.75	18.75	47.89	26.91	15.59	300.17	21.61
$LSD_{0.05}$	1.04	0.595	1.145	1.495	0.074	2.003	0.144
Sig. level	*	*	*	*	*	*	*

* = Significant at 5% level of probability. V_1: Early You, V_2: Barbara, V_3: Green Crown; T_0: Control, T_1: B @3 kg/ha, T_2: Zn @ 2 kg/ha, T_3: B +Zn @(3+2) kg/ha.

3.3. Combined effects of varieties and organic manures on growth and yield of Broccoli

Result showed that combined effects of varieties and organic manures had significant influence on all the growth parameters of broccoli under study (Table 3). The highest plant height at (23.55 cm), number of leaves per plant (18.50 cm) were recorded when V_2T_3 (B+Zn @3+2 kg/ha and Barbara variety) was applied. Furthermore, the highest number of leaves (18.50) also recorded from V_1T_3.and the lowest plant height at (9.33cm) and number of leaves per plant (12.5) were recorded from V_1T_0 (control and Early You Variety) (Table 3).

Maximum length of the largest leaf (53.45cm) was recorded from V_1T_3 (B + Zn @ 3+2 kg/ha along with Early You variety) and minimum length of largest leaf was recorded in V_1T_0 (control and Early You Variety). Maximum breadth of the largest leaf (26.91cm) was recorded when V_3T_3 (B + Zn @ 3+2 kg/ha along with Green Crown variety) was applied whereas minimum breadth of the largest leaf (13.36 cm) was recorded from V_1T_0 (control and Early You Variety) (Table 3). These result are in close conformity with the study carried out by Seefeldt *et al.* (2011) and Tejaswini *et al.* (2018).

The maximum curd diameter (15.59cm) and primary curd weight (300.17g) and yield per hectare (21.61 t) was obtained from V_3T_3 (B + Zn @ 3+2 kg/ha along with Green Crown variety) whereas the minimum curd diameter

(8.72cm) and primary curd weight (72.73g) and yield per hectare (5.23t) was obtained from V_1T_0 (control and Early You Variety) (Table 3). Similarly, maximum yield (21.61 t/ha) was obtained from V_3T_3 (B + Zn @ 3+2 kg/ha along with Green Crown variety) whereas the minimum yield (5.23t/ha) was obtained from V_1T_0 (control and Early You Variety) (Table 3). Green Crown has the genotype of producing wider curd and B+Zn produce heavier curd resulting in highest yield. These result are in close conformity with the study carried out by ŠLOSÁR *et al.* (2017).

4. Conclusion

Results indicated that variety and micronutrients had significant effects on the growth, yield and quality of broccoli. Different varieties significantly influenced all the parameters studied. The highest plant height, number of leaves per plant and length of the largest leaf were obtained from Barbara. Then maximum breadth of the largest leaf, curd diameter and curd yield were obtained from Green Crown whereas lower plant height, number of leaves per plant, length of the largest leaf, breadth of the largest leaf, stem length, curd diameter and curd yield were obtained from Early You. The highest plant height, number of leaves per plant, length of the largest leaf, breadth of the largest leaf and curd diameter were obtained from T_3 (B+Zn @ 3+2 kg/ha) and the lowest plant height, number of leaves per plant, length of the largest leaf, breadth of the largest leaf and curd diameter were obtained from T_0 (Control). The highest yield per hectare was obtained from V_3T_3 (B + Zn @ 3+2 kg/ha along with Green Crown variety). On the other hand, the lowest yield per hectare was obtained from V_1T_0 (control and Early You Variety) In conclusion, combined application of B + Zn @ 3+2 kg/ha along with Green Crown variety could be used for increasing the growth and yield of Broccoli.

Conflict of Interests

The authors declare that there is no conflict of interests regarding the publication of this paper.

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