INFLUENCE OF BUD PRUNING AND FOLIAR APPLICATION OF ZINC AND BORON ON GROWTH, FLOWERING AND YIELD OF BRINJAL

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CERTIFICATE

This is to certify that thesis entitled, **"INFLUENCE OF BUD PRUNING AND FOLIAR APPLICATION OF ZINC AND BORON ON GROWTH, FLOWERING AND YIELD OF BRINJAL"** *submitted to the Department of Horticulture, Sher-e-Bangla Agricultural University, Dhaka, in partial fulfillment of the requirements for the degree of* ***MASTER OF SCIENCE (MS) in HORTICULTURE****, embodies the result of a piece of Bonafede research work carried out by* ***SINIGDHA NAHAR NIPA****, Registration No.****19-10178****under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.*

I further certify that such help or source of information, as has been availed of during the course of this investigation has duly been acknowledged.

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BY

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ABSTRACT

The pot experiment was carried out at the Horticulture Farm of Sher-e-Bangla Agricultural University, Dhaka during the period from April to September 2021 to find out the effect of bud pruning and foliar application of Zinc and Boron on growth, flowering and yield of brinjal. BARI Begun 8 variety was used as planting material. The two factors experiment was laid out in Randomized Completely Block Design with three replications. The factors were: Factor A: Three types of pruning treatment such as (i) P_0: No pruning, (ii) P_1: Lateral bud pruning, (iii) P_2: Apical bud pruning, and Factor B: Four concentration of foliar application of Zn and B (i) T_0: Control, (ii) T_1: 0.2% Zn application (iii) T_2: 0.2% B application, (iv) T_3: 0.2%Zn + 0.2% B application. The total treatment combinations were 12 (3x4). The highest plant height (37.91cm), number of fruits per plant (14.75), yield per pot (1.46 kg), yield ton per hectare (27.93 ton) were recorded at P_2 (Apical bud pruning) and lowest value was measured at P_0 (No pruning). The present result also shows that foliar application of zinc and boron significantly increased the growth contributing characters, fruit weight as well as yield of brinjal. The combined effect of apical bud pruning and foliar application with 0.2% (Zn+B) produced the tallest plant (56.00 cm), at harvest the highest number of fruits per plant (19.67), the highest yield per pot (1.97 kg),the highest yield ton per hectare (33.00 ton), whereas the lowest value was found from P_0T_0 (Control). Finally, it may therefore be concluded that the combination of bud pruning and foliar application of 0.2% (Zn+B) was suitable for best growth and yield of BARI begun 8.

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LIST OF ACRONYMS

AEZ	Agro-Ecological Zone
BARI	Bangladesh Agricultural Research Institute
BBS	Bangladesh Bureau of Statistics
Zn	Zinc
B	Boron
cv.	Cultivar
DAE	Department of Agricultural Extension
DAT	Days after transplanting
et al.	And others
FAO	Food and Agriculture Organization of the United Nations
HI	Harvest Index
MoP	Muriate of Potash
NS	Non significant
SAU	Sher-e-Bangla Agricultural University
SRDI	Soil Resources and Development Institute
TSP	Triple Super Phosphate
^{0}C	Degree Celsius
Wt.	Weight

CHAPTER I

CHAPTER I

INTRODUCTION

Eggplant or Aubergine are berry-producing vegetables belonging to the large Solanaceae family (nightshade family), which contains ~3,000 species distributed in some 90 genera (Vorontsova and Knapp, 2012).Brinjal (*Solanum melongena L.*) has the early European name "eggplant" locally known as "Begun" is a self-pollinated annual crop (Thompson, 1951). It is a major vegetable crop throughout the tropic and subtropics area (Bose and Som, 1986).

Eggplant is nutritionally low in macronutrient and micronutrient content, but the capability of the fruit to absorb oils and flavors into its flesh through cooking expands its use in the culinary arts. An edible portion of 100 gm brinjal contains 1.4 gm protein, 18 mg calcium and 24 kcal of food energy. In addition, brinjal consists of almost 92.7 percent of water and it is superior in terms of fiber, folic acid, manganese, thiamin, vitamin B_6, magnesium and potassium to that of most other vegetables (Chadha and kalloo,1993).Fried brinjal in till has some medicinal value to cure liver problem. It has potentiality as raw material in picking and in dehydration industries (Singh *et al.* 1963). It is largely cultivated in almost all districts of Bangladesh. It can be grown at homestead area and kitchen garden because of its popularity especially for urban people. It gives small, marginal and landless farmers a continuous source of income and provides employment facilities for rural people. Yield expression of a genotype is mainly governed by environmental conditions and other management factors. Yield differences may also be occurred due to variation in cultural practices. Foliar spraying of micronutrients and pruning are two important cultural practices which may be the limiting factors of yield.

Micronutrients play a catalytic role in nutrient absorption and balancing other nutrients. They are required in small quantity for normal growth and development of plants. Foliar spraying of microelements like Zinc and Boron is very helpful when the roots cannot provide necessary amounts of it. Nutrients are generally quickly available to the plants by the foliar application than the soil application. Silberbush*et al.* (2002)According to Kołota and Osińska, (2001) foliar feeding is an effective method of supplying nutrients during the period of intensive plant growth when it can improve plants mineral status and increase crop yield.

Narimani *et al*. (2010) reported that foliar application of microelements improves the effectiveness of microelements. Amino acids accumulated in plant tissues and protein synthesis decline by zinc deficit. Zn is known to have an important role either as a metal component of enzymes or as a functional, structural or regulatory cofactor of a large number of enzymes. Zinc also plays an important role in the production of biomass. Furthermore, Zinc may be required for chlorophyll production, pollen function and fertilization. Moghaddasi *et al.* (2017) suggested that shoot and root growth as well as yield was higher for zinc application. Micronutrients such as boron had great influence on plant growth and development. The main function of boron related to cell wall strength and development, RNA metabolism, sugar transport, hormones development, respiration, cell division, Indole acetic acid (IAA) metabolism and as part of the cell membranes. Marchner *et al.* (1995). Boron deficiency halts flowering, fruit setting by retarding pollen germination and pollen tube development. Halfacre *et al.* (1979). Boron also plays an important role in flowering and fruit formation. Nonnecke IBL. (1989).

Proper pruning practices may lead to the production of relatively large sized fruit with better quality, increase yield, early harvest, easy harvesting of fruits and conveniences in intercultural operation without damage to the fruits or plants. Lipari (1981) reported that pruning increases fruit quality and yield in eggplants. Pruning to balance the number of shoots and leaves causes an increase in flowers and fruits. Pruning at every node two fruit set was recommended for higher yield with good quality of eggplants (Shehtata, 2012). Ambroszczyk*et al.,* (2008) reported in brinjal that plants pruned to two shoots, second shoot led out from the sixth node produced the greatest fruits, both in early and total yield. But in Bangladesh, majority of the growers do not get good quality fruit and high yield because of their ignorance about proper pruning practices. By the proper management of these cultural practices, it may be possible to increase the yield of brinjal. Considering the facts, the research work was carried out to find out suitable bud pruning operation and foliar application of Zn and Bon the growth, flowering and yield of brinjal.

OBJECTIVES

The present experiment was undertaken with the following objectives:

1. To evaluate the effect of bud pruning operation on the growth, yield, fruit quality of brinjal.
2. To find out the effect of foliar spraying of Zn and B on the flowering, fruiting and quality fruit production of brinjal.

CHAPTER II

CHAPTER II

REVIEW OF LITERATURE

In this chapter, an attempt has been made to review the available information in home and abroad on the effect of Foliar spray of (zn and B) and bud pruning on the growth and yield of brinjal.

2.1 Effect of bud pruning on the growth and yield of brinjal

A Hesami*et al.,* (2012) Effect of shoot pruning and flower thinning on quality and quantity of semi-determinate tomato (*Lycopersicon esculentum Mill.*)
There are many constraints of space, light and availability of fruits to harvest in tomatoes greenhouse. Therefore, two experiments were carried out to determine the effect of shoot pruning and flower thinning on quality and quantity of fruits of semi-determinate tomato in a greenhouse of the Faculty of Agriculture and Natural Resources, Persian Gulf University of Bushehr. Experimental design was randomized complete block designs in which the effect of shoot pruning (single branch pruning, double branch pruning, pyramidal pruning and control) or flower thinning (Cluster with 4 and 5 remained flowers and control) were studied separately. Results showed that, leaf area and plants yield were higher in treatments which were pruned than control. Yields from pyramidal pruning and cluster thinning with 5 remaining flowers were significantly higher than other treatments. On the other hand, qualitative study identified that pyramidal pruning increases vitamin C in fruits, but had no significant effect on total soluble solids.

Maboko*et al.* (2011**)** reported that a study was conducted in 2009 to 2010 and 2010 to 2011 to investigate the effect of plant population, fruit and stem pruning of hydroponically grown tomatoes in a 40% (black and white) shade-net structure at the ARC-Roodeplaat VOPI. An open bag hydroponic system containing sawdust as a growing medium was used in this experiment. Tomato plants were subjected to three plant populations (2, 2.5 or 3 plants/m^2), two stem pruning treatments (one stem and two stems) and three fruit pruning treatments (four fruits, six fruits per truss, and no fruit pruning). Experimental layout was a complete randomized block design with three replicates. Data on fruit number, fruit mass, unmarketable yield, marketable yield and total yield was collected from 10 plants for all treatments. Plants pruned to two stems with zero fruit pruning or pruned to six fruits produced significantly higher marketable and total yield, as compared to the other treatments. Plant population of 3 plants/m^2, resulted in significantly higher marketable yield of tomatoes, compared to 2.5 and 2 plants/m^2. Results showed that tomato yield and quality can be effectively manipulated by plant population and stem pruning, while fruit pruning had only a limited effect.

Ambroszczyk*et al.,* (2008) conducted "The effect of plant pruning on the light conditions and vegetative development of eggplant (*Solanum melongena L.*) in greenhouse cultivation. "The aim of the investigations was to find the relations between pruning methods and chosen parameters of vegetative eggplant development in greenhouse conditions. The plant shape modifies the photo synthetically active radiation (PAR) conditions in the plant profile. Independence between different pruning methods and vegetative plant development particularly leaves characteristics as well as pigments and photosynthesis products content in leaves was stated. The investigations were carried out in 1999–2001 in the experimental greenhouse of Agricultural University in Kraków, Poland. 'Tania F 1'hybrid was used in the early spring-summer production in a heated greenhouse. The following pruning systems were applied: pruning to one shoot with leaving on every node 2 fruit sets and 1, 2 or 3 leaves, and pruning to two shoots with leaving on every node 1 fruit set and 1, 2 or 3 leaves. With the introduction of a greater number of leaves and fruit sets on eggplant shoots irradiation in plant profile was reduced. The value of leaf area index (LAI) depended on the way of pruning. Chemical composition of leaves was slightly dependent on the method of pruning only in the case of assimilation products, ie reducing sugar and starch. Improvement of photosynthesis efficiency of intensively pruned eggplants was achieved by the increase of single leaf area and thickness of leaf mesophyll tissues without the increase of the level of assimilative pigments per plant mass unit.

Singh *et al.* (1999) conducted an experiment to examine the effect of leaf pruning on growth and yield of brinjal in a cv. Pusa purple Long. Pruning of older leaves was very light (2-3), light (4-5), medium (6-7), heavy (8-9) and very heavy (10-11 leaves) with the control having no leaf pruning. Very heavy pruning advanced flowering and fruiting by 10 days but total yield was reduced. Light and medium leaf pruning generally induced flowering 6-7 days earlier and produced the highest yield (5.5 kg/plant). Generally, very light leaf pruning was not effective in influencing flowering and fruiting.

Poksoy *et al.* (1993) conducted an experiment to examine the effects of different pruning on the yield and quality of eggplant cultivars grown in green house conditions. Plants of the F, aubergine cultivars Dusky, Vittoria, Valentina, Indra, Sicilia, Palmira and Imperial were pruned to leave either 2 or 3 main shoots above 30-35 cm height, with lateral shoots pruned to leave a fruit and 3 leaves or left not pruned. Both pruning methods (i.e. to 2 or 3 shoots) significantly increased main shoot length and 1st class fruit yield. Total yield was not affected by pruning method. The highest total and 1st class fruit yields were obtained with the cultivars Sicilia and Imperial.

2.2 Effect of foliar application of Zinc and Boron

Z Abbas *et al.,* (2021) conducted "Evaluation of best dose of micronutrients (Zinc, Iron and Boron) to combat malnutrition in brinjal (*Solanum melongena L.*)"

The study was carried out in the farmer's fields of Bahawalpur during Kharif-2018 and Kharif-2019 to examine the impact of different doses of micronutrients (Zn, Fe and Boron) on the yield and quality of brinjal. The experiment was laid out in Randomized Complete Block Design (RCBD) with three replications. Five different levels of micronutrients were applied. The treatment T_5ie (100-60-50) + Borax (0.2) + $ZnSO_4$ (0.5%) + $FeSO_4$ (0.5%) exhibited maximum plant height, fruit weight, total yield, number of fruits plant-1 and survival percentage except number of leaves plant-1 which were maximum in T_4 i.e. (100-60-50) + $ZnSO_4$ 0.5%. Concludingly, growth parameters of all the three cultivars of eggplant showed maximum performance ie plant height (88.57, 139.77 and 135.11 cm), fruit weight (213, 284 and 261 g), yield (10.11, 11.98 and 12.39 t ha-1), survival percentage (95.71, 99.63 and 90.23%) and number of fruits per plant (9.81, 8.67 and 8.11) due to T_5 in black boy, twinkle star and shamli varieties, respectively. Hence, Borax (0.2) + $ZnSO_4$ (0.5%) + $FeSO_4$ (0.5%) kgha^{-1} is recommended as the best dose of micronutrient for brinjal.

B Saha*et al.,* (2020) "Could maneuvering the methods of zinc and boron application influences yield and agro-morphological traits of brinjal in inceptisols?"

Brinjal is one of the widely grown vegetables with high nutritive value responsive to applied Zn and B in deficient soils. With this background, a pot experiment was conducted at College of Horticulture Farm to study the effect of FYM, zinc and boron on yield and agro-morphological characters of brinjal where two levels of FYM (0 and 5 t ha^{-1}), four levels of Zn (Zn0: No Zn, Zn1: 5.0 kg Zn ha^{-1} as basal, Zn2: 10.0 kg Zn ha^{-1} as basal and Zn3: 5.0 kg Zn ha-1 as basal+ Foliar spray of Zn twice@ 0.5% $ZnSO_4$. $7H_2O$ solution) and three levels of B (B_0: No B, B_1: 1kg B ha^{-1} and B_2: 2 kg B ha^{-1}) were applied in factorial completely randomized design. The application of Zn and B significantly influenced the fruit yield and other agro-morphological parameters viz., number of fruits per plant, plant height, fruit diameter and fruit length of brinjal. The highest increase was found with the conjoint application of soil + foliar application of Zn and highest dose of B i.e. 2.0 kg B ha-1 along with FYM. On average, fruit yield of brinjal varied between 0.92 to 1.31 kg pot-1 with a mean value of 1.12 kg pot-1. Zinc application@ 10.0 kg ha^{-1} through basal (Zn2) as well as soil+ foliar application of Zn (Zn3) significantly enhanced the fruit yield of brinjal over the application of 5.0 kg Zn ha^{-1} as well as over the control. Application of Zn fertilizers along with FYM enhanced the brinjal fruit yield to the extent of 10-24% over the control under different treatment combinations of Zn (either soil application or through soil plus foliar application), whereas, application of B increased the fruit yield to the tune of 12 to 17% compared to no B application. The interaction between FYM and Zn and well as between FYM and B had also shown significant positive effect towards fruit yield of brinjal.

DJ Modi *et al.,* (2019) conducted an experiment "Effect of zinc and boron application on yield of brinjal (*Solanum melongena L.*) in Bharuch district of Gujarat."
The field demonstrations were carried out during 2016-17 in Rabi season to know the effect of zinc and boron on yield of brinjal for a total 10 farmers from Bharuch district. The production of brinjal is quite low in some parts of the district due poor soil fertility status and imbalance fertilizer application by farmers. There was a complete absence of micronutrients applied to the crop. The initial soil analysis data showed deficiency of zinc and boron in experimental soil. Thus, to compare the effect and method of use of zinc and boron; soil application and foliar spray were made along with improved practices against farmer practices. The highest plant height, average fruit weight, number of fruits per plant and fruit yield of brinjal was recorded with the soil application of zinc and boron which was superior over the foliar spray and farmer’s practices. The gross return, net return and benefit cost ratio recorded was also maximum in improved practices consisting of soil application of zinc and boron as compared to farmer's practices.

AK Pandav*et al.,*(2016) conducted "Effect of foliar application of micronutrients on growth and yield parameters in Eggplant cv HLB 12"

The investigation was carried out during autumn-winter season of 2014-15 The experimental treatments viz., T_1 (control-water spray), T_2 (zinc sulfate 0.3%), T_3 (zinc sulfate 0.4%), T_4 (zinc sulfate 0.5%), T_5 (iron sulfate 0.3%), T_6 (iron sulfate 0.4%), T_7 (iron sulfate 0.5%), T_8 (borax 0.3%), T_9 (borax 0.4%) and T_{10} (borax 0.5%) were laid out in a randomized block design (RBD) for field studies with three replications and plot size 3.0× 3.0 m. Five competitive plants were randomly selected from each experimental treatment to record data on various parameters, which were influenced significantly by different concentrations of micronutrients. The plant height (cm) at 60, 90 and at maturity, the number of fruits per plant, fruit length and diameter (cm) and average fruit weight (g), increased significantly with increasing concentration of micronutrients (up to 0.4%). However, the character days to physiological maturity was found non-significant with the application of micronutrients. The study suggested that for getting maximum plant growth and yield of eggplant cv HLB 12, the crop should be sprayed with zinc sulfate 0.4%.

NM Kumar *et al.,*(2016) "Growth and yield of solanaceous vegetables in response to application of micronutrients".

Micronutrients are present in lower concentrations in soil than macronutrients but are equally significant in plant nutrition, since, plants grown in micronutrient-deficient soils show similar reductions in productivity as those grown in macronutrient-deficient soils. Solanaceous vegetables are the part of diet of all over the world. With growing demand for quality of vegetables as people are becoming more health conscious, there is a need to go for balanced fertilization of both macro and micronutrients. Micronutrients play a profound role in various metabolic functions of plants; therefore, without micronutrient application there occurs deficiency and eventually reduction in yield and quality. Foliar application of micronutrients shows better efficacy than soil application as the uptake and assimilation of micronutrients by later method takes more time. Owing to intensive agriculture and high yielding varieties of vegetables extra mining of nutrients takes place which leads to negative nutrient balance in the soil. Hence, to cope up with the needs of the crop, application of micronutrients in addition to macronutrients must be ensured.

CHAPTER III

CHAPTER III

MATERIALS AND METHODS

The materials and methods that were used for conducting the experiment has been presented in this chapter.

3.1 Location

The experiment was conducted at the farm of Horticulture, Sher-e-Bangla Agricultural University, Dhaka (90.06^0 E longitudes and 24.09^0N latitude) during the period from April to September 2021.The altitude of the locations was 8.2 m from the sea level as per the Bangladesh Metrological Department, Agargaon, Dhaka-1207 (Anon., 1989).

3.2 Climate

The experimental site is located in subtropical region where climate is characterized by heavy rainfallduringthemonthsfromApriltoSeptember(Kharifseason)andscantyrainfallduringrest of the month (Rabiseason). The maximum and minimum temperature, humidity rainfall and soil temperature during thestudy period are collected from the Sher-e-Bangla Mini weather station(Appendix-1).

3.3 Soil

Experimental site belongs to the Modhupur Tract (UNDP, 1988) under AEZ No.28 and thesoil of the pot was medium in nature with adequate irrigation facilities.The soil texture of the experiment was sandy loam. The nutrient status of the farm soil under the experimental potwere collected and analyzed in the Soil Research and Development Institute Dhaka, and result has been presented in Appendix II.

3.4 Planting materials

Thirty days seedlings of BARI Begun 8 were used as planting material. The seedlings of brinjal were grown at the seedbed of Sher-e-Bangla Agricultural University Horticulture Farm.

3.5 Treatments

The experiment consisted of two factors as mentioned below:

Factor A: Different type ofbud pruning

a) P_0 = No pruning/control

b) P_1 = Pinching of the lateral buds

c) P_2 = Pinching of the terminal bud

Factor B: Different doses of Zinc, Boron application

a) T_0 = No Zn and B spray/control

b) T_1 = 2 gm/l Zn spray

c) T_2 = 2gm/lB spray

d) T_3 = 2 gm/l Zn and 2gm/l Bspray

Treatments combinations: P_0T_0, P_0T_1, P_0T_2, P_0T_3, P_1T_0, P_1T_1, P_1T_2, P_1T_3, P_2T_0, P_2T_1, $P_2T_2$and P_2T_3.

3.6 Design and layout

The experiment was laid out in a Randomized Completely Block Design (RCBD) with three replications. Total 36 pots were taken and the experiment area was divided into three equal blocks.12 pots were placed on each block where 12 treatments combination were allotted. The distance between two blocks and two pots were 1.0 m and 0.5 m respectively.

3.7 Pot preparation

The collected soil was sun dried, crushed and sieved. The soil and fertilizers were mixed well before placing the soils in the pots. The experimental pots were filled with soil andpots were placed at the germplasm of Sher-e-Bangla Agricultural University. The pots were pre-labeled for each treatment. The soil was treated with insecticides (cinocarb 3G @ 4 kg/ha) at the time of final pot preparation to protect young plants from the attack of different soil micro-organism or insects.

3.8 Fertilizer application

The sources of N, P_2O_5, K_2O as urea, TSP and MP were applied, respectively. The entire amounts of TSP and MP were applied during the final pot preparation. Urea was applied in three equal installments at 15, 30 and 45 days after seedling transplanting (DAT). Well-rotten cow dung 5 t/ha also applied during final pot preparation. The followingmanures and fertilizers dozes were used which shown as tabular form recommended by Fertilizer Recommendation Guide- 2018, published by Bangladesh Agricultural Research Council (BARC).

Table 1: Fertilizer and Manure Applied for the experimental field

Manures and Fertilizers	Rate (kg/ha)	Rate (g/pot)
Cow dung	5000	227
Nitrogen (N_2)	136-180	9
P_2O_5 (as TSP)	37-48	5
K_2O (as MP)	106-140	7

3.9 Raising of seedlings

Brinjal seedlings were raised in one seedbed of 3m × 1m size area. The soil was well prepared and converted into loose friable and dried mass by spading. All weeds and stubbles were removed and 5 kg well rotten cow dung was mixed with soil in seedbed. 3g seeds were sown on seedbed on 11April, 2021. After sowing, seeds are covered with light soil. Heptachlor 40 WP was applied @ 4kg/ha, around each seedbed as precautionary measure against ant and worm. Seedlings emerged after 5 to 6 days of sowing. When the seed completely germinated, shade by bamboo mat was provided to protect the young seeding from scorching heat and rain. No chemical fertilizer was applied for raising the seedlings. Seedlings were not attacked by any kind of insect or diseases.

3.10 Transplanting of seedlings

Healthy and uniform 30 days old seedlings were transplanted in the experimental pots in the afternoon of 12 May, 2021. The seedlings were watered after transplanting. Shading was provided for three days to protect the seedling from hot sun and removed after seeding was established. They were kept open at night to allow them receiving dew. Each pot allowed two seedlings and one seedling is removed from pot after establishment of seedlings.

3.11 Application of pruning treatment

Primary lateral and terminal buds on the plants were pruned according to the treatments. Pinched the first set of buds as when plants started to bloom and the buds were visible. Fingers were used gently to pinch the buds right where they meet the stem of the plant. Pruning was done on 29th May, 2021.

3.12Interculturaloperation

After transplantation of seedling, various intercultural operation such as weeding, irrigation pest and disease control etc. were accomplished for better growth and development of the brinjal plant as when it necessary.

3.12.1 Weeding

Hand weeding was done whenever necessary to keep the pots free from weeds. Weeding was done every 15 days interval from planting to the peak flowering stage. Spading was done from time to time specially to break the soil crust.

3.12.2 Staking

When the seedlings were established, staking was given to each plant. Stick of bamboo was given to support the growing twig.

3.12.3 Irrigation

Light watering was given by a watering cane in each pot with equal amount as necessary at afternoon.

3.12.4Pest and disease control

As prevention measure against the insect pest like cutworm, shoot and fruit borer, leaf hopper etc. Malathion 60 EC @ 2 ml per liter was applied to reduce the attack in the pot. Many cleaning practices were also done to reduce the insect attack. Ripcord was also applied to control the insect pest @ 85 ml/ha. Precautionary measures against various diseases of brinjal were taken. Neem powder mixed with water @ 5.0% and ash spraying was done to control the bacterial and fungal disease of brinjal.

3.13Harvesting

When the fruits were in marketable condition then they were harvested.

3.14 Data collection

The following data were collected from plant of each unit pot.Datawas collected for the following parameters-

i. Plant height (cm)
ii. Number of leaves per plant
iii. Number of branches per plant
iv. Days required from transplanting to 1^{st}flowering
v. Number of flowers per plant
vi. Number of fruits per plant
vii. Length of the fruit (cm)
viii. Diameter of fruit (cm)
ix. Weight of individual fruit (gm)
x. Yield per pot (kg)
xi. Yield (t/ha)
xii. Statistical analysis

Data collection procedure

3.14.1 Plant height (cm)

The height of the brinjal plants was recorded from 20 days after transplanting (DAT) at 20 days interval up to 60 DAT, beginning from the ground level up to tip of the leaf was counted as height of the plant.

3.14.2 Number of leaves per plant

The total number of leaves per plant was counted from plant of each unit pot. Data was calculated as 20 days interval starting from 20 days of planting.

3.14.3 Number of branches per plant

The total number of branches per plant was counted from plant of each unit pot. Data was calculated as 20 days interval starting from 20 days of planting.

3.14.4 Days required from transplanting to 1stflowering

Days required for transplanting to initiation of flowering was counted from the date of transplanting to the initiation of flowering and was calculated.

3.14.5 Number of flowers per plant

Number of flowers per plant was counted from the plant of each unit pot and the number of flowers was calculated.

3.14.6 Number of fruits per plant

Number of fruits was counted from first harvest to last harvest. The total number of fruits per pot was counted and average number of fruits was recorded.

3.14.7 Length of the fruit (cm)

The length of the fruit was measured with a scale from the neck of the fruit to the bottom of 5 selected marketable fruits from each pot and their average was taken and expressed in cm.

3.14.8 Diameter of fruit (cm)

Diameter of fruit was measured at middle portion of 5 selected marketable fruit from each pot with a slide caliper and their average was taken and expressed in cm.

3.14.9Weight of individual fruit (gm)

Among the total number of fruits during the period from first to final harvest the fruits, except the first and final harvest, was considered for determining the individual fruit weight.

3.14.10Yield perpot (kg)

Yield of brinjal per plant was calculated as the whole fruits per plant and was expressed in kilogram.

3.14.11 Yield (t/ha)

According to field condition number of plant per hectare was calculated considering plant to plant distance 75cm x 60cm. The experimental pot was arranged according to that distance and thus yield per pot was converted to yield per hectare in ton.

3.14.12Statistical analysis

The recorded data on different parameters were statistically analyzed using Statistix10 software and mean separation was done by LSD test at 5% level of probability.

CHAPTER IV

CHAPTER IV

RESULT AND DISCUSSION

4.1Plant height (cm)

4.1.1 Influence of bud pruning

Plant height of brinjal varied significantly due to different types of bud pruning at different days after transplanting (DAT) (Table 2). At 20, 40 and 60 DAT, the longest plant (11.25cm, 21.08cm, and 37.91cm) respectively was recorded from P_2 (Apical bud pruning) which was closely followed (8.83cm, 18.08 cm and 27.58 cm) with P_1 (Lateral bud pruning) and while the shortest plant (8.75cm, 15.58 cm and 23.50 cm) from P_0 (Control) respectively.This might be due to that, pruning helped for proper vegetative growth of brinjal plant. Mabokoet *al.* (2011), Ambroszczyk*et al*. (2008) and Srinivasan *et al.* (1999) found the similar result that pruned plants were significantly taller than non-pruned plants of Hybrid tomato.

4.1.2Influence of foliar application of zinc and boron

Plant height of brinjal varied significantly due to different levels of foliar application of zinc and boron at different days after transplanting (DAT) (Table 2). At 20, 40 and 60 DAT, the longest plant (11.33 cm, 22.11cm and 38.44 cm) was recorded from T_3(0.2%Zn + 0.2%B) which was closely followed (9.67cm, 16.78cm and 27.67 cm) by T_1 (0.2% Zn), and then (8.56 cm, 18.33cm and 26.78 cm) by T_2 (0.2% B), while the shortest plant (8.89 cm,15.78 cm and 25.78cm) from T_0 (Control) respectively (Table2).The fact that, application of Zn and B help to get higher vegetative growth in plant. The present finding is agreed with the finding ofAbbas *et al.,* (2021) and Saha*et al.,* (2020).

Table 2: Effect of bud pruning and foliar application of zinc and boron on height per plant (cm)

Pruning	Height Per Plant (cm) at different DAT		
	20	40	60
P_0	8.83 ab	15.58 b	23.50 c
P_1	8.75 b	18.08 ab	27.58 b
P_2	11.25 a	21.08 a	37.91 a

$LSD_{0.05}$	2.47	3.06	2.17
CV (%)	30.38	19.85	8.66

Fertilizer	**Height Per Plant (cm) at different DAT**		
	20	**40**	**60**
T_0	8.89 a	15.78 b	25.78 b
T_1	9.67 a	16.78 b	27.67 b
T_2	8.56 a	18.33 b	26.78b
T_3	11.33 a	22.11 a	38.44 a
$LSD_{0.05}$	2.85	3.54	2.51
CV (%)	30.38	19.85	8.66

DAT = Days after transplanting; T_0 = Control, T_1 = 0.2% Zn, T_2 = 0.2% B, T_3 = 0.2% (Zn + B); P_0 = No pruning, P_1 = Lateral bud pruning, P_2 = Apical bud pruning

4.1.3 Combined effect of bud pruning and foliar application of zinc and boron

Interaction effect of bud pruning and foliar application of zinc and boron showed statistically significant variation for plant height at 20, 40 and 60 DAT (Appendix III). At 20 DAT the longest plant (16.33 cm) was recorded from P_2T_3 (Apical bud pruning +0.2% Zn,B) and P_2T_0 (Apical bud pruning + Control) was (12 cm) and the shortest plant (5 cm) was recorded from P_0T_0 (Control). At 40 DAT the similar trend of interaction effect between pruning and foliar application of zinc and boron showed on the plant height of brinjal. At 60 DAT, the longest plant (56 cm) was recorded from P_2T_3(Apical bud pruning +0.2% Zn,B)and the shortest plant (17.67 cm) was recorded from P_0T_0 (Control) (Figure 1).

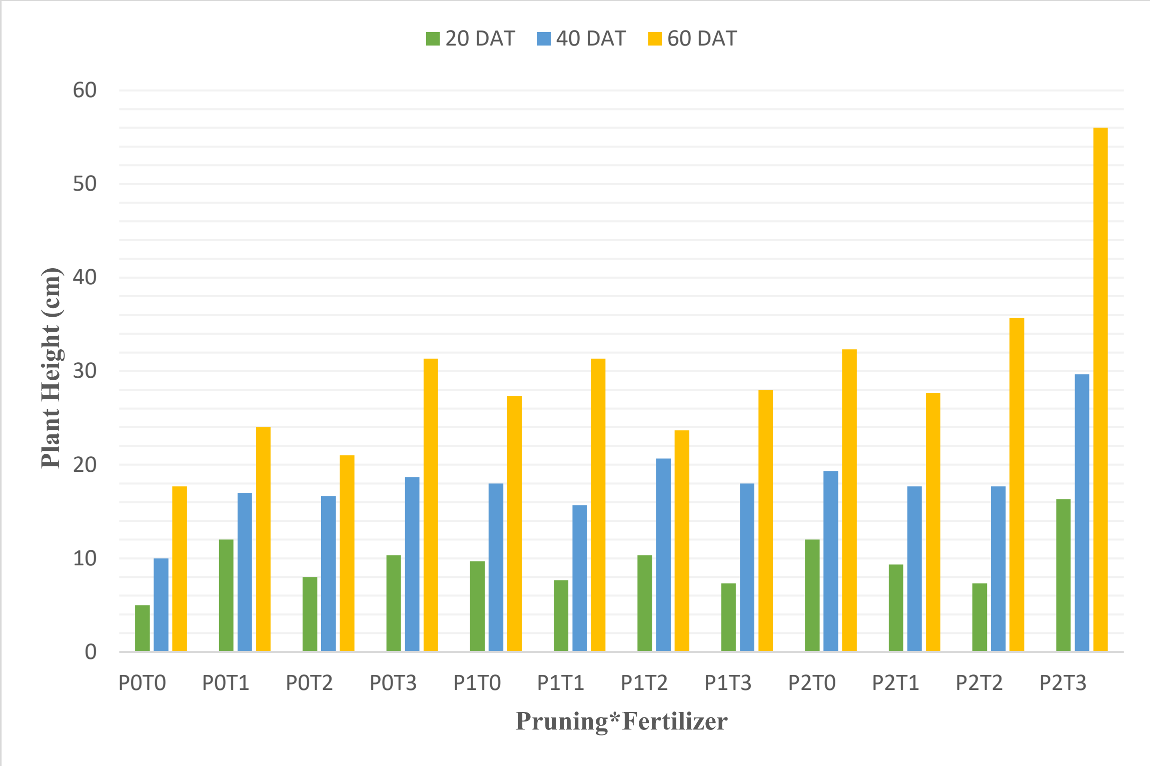

Figure 1: Influence of bud pruning and foliar application of zinc and boron on height per plant (cm)

DAT = Days after transplanting; T_0 = Control, T_1 = 0.2% Zn, T_2 = 0.2% B, T_3= 0.2% (Zn + B); P_0 = No pruning, P_1 = Lateral bud pruning, P_2 = Apical bud pruning

4.2Number of leaves per plant

4.2.1 Influence of bud pruning

The positively significant effect of bud pruning was observed in terms of number of leaves plant^{-1}(Table3). The range of number of leaves plant^{-1} were 8.67 to 10.00 at 20 DAT, 12.33 to 22.00 at 40 DAT and 19.33 to 25.42 at 60 DAT. The maximum number of leaves plant^{-1} was found in P2 treatment (10, 22 and 25.42 at 20 DAT, 40 DAT and 60 DAT respectively) compared to other treatments. This might be due to that, pruning helped for proper vegetative growth of brinjal plants. Mabokoet *al.* (2011), A Hesamiet *al.,* (2012) and Utoboet *al.* (2010) also reported similar results.

4.2.2 Influence of foliar application of zinc and boron

Number of leaves plant^{-1} was significantly influenced by foliar applied of zinc and boron in brinjal (Table3). The highest number of leaves was recorded in T_3 (10, 22.78 and 30 at 20

DAT, 40 DAT and 60 DAT respectively). The lowest values of this trait were found in T_0 (7.33, 14.33:and 16.67 at 20 DAT, 40 DAT and 60 DAT respectively). The foliar application of Zn and B helped to get higher vegetative growth in brinjal plants. The present finding is agreed with the finding of B Saha*et al.,* (2020), DJ Modi *et al.,* (2019) and AK Pandav*et al.,* (2016).

Table 3: Effect of bud pruning and foliar application of zinc and boron on leaves per plant

Pruning	**Leaves Per Plant at different DAT**		
	20	**40**	**60**
P_0	8.67 ab	12.33 c	19.33 c
P_1	7.33 b	17.17 b	22.08 b
P_2	10.00 a	22.00 a	25.42 a
$LSD_{0.05}$	1.43	2.12	1.60
CV (%)	19.58	14.60	8.52
Fertilizer	**Leaves Per Plant at different DAT**		
	20	**40**	**60**
T_0	7.33 c	14.33 b	16.67 c
T_1	8.22 bc	15.56 b	21.11 b
T_2	9.11 ab	16.00 b	21.33 b
T_3	10.00 a	22.78 a	30.00 a
$LSD_{0.05}$	1.65	2.45	1.85
CV (%)	19.58	14.60	8.52

DAT =Days after transplanting; T_0= Control, T_1 = 0.2% Zn, T_2 = 0.2% B, T_3 = 0.2% (Zn + B); P_0 = No pruning, P_1 = Lateral bud pruning, P_2 = Apical bud pruning

4.2.3 Combined effect of bud pruning and foliar application of zinc and boron

Combined effect of bud pruning and foliar spray of zinc and boron showed a wide range of variation for number of leaves plant^{-1} at all sampling dates except at 20 DAT(Appendix V). The highest number of leaves plant^{-1} was found in P_0T_3 on 20 DAT which was 11.67 and the rest treatments P_2T_3 showed highest data as(29.33 and 36.00 at 40 DAT and 60 DAT respectively.) compared to other combinations (Figure 2).

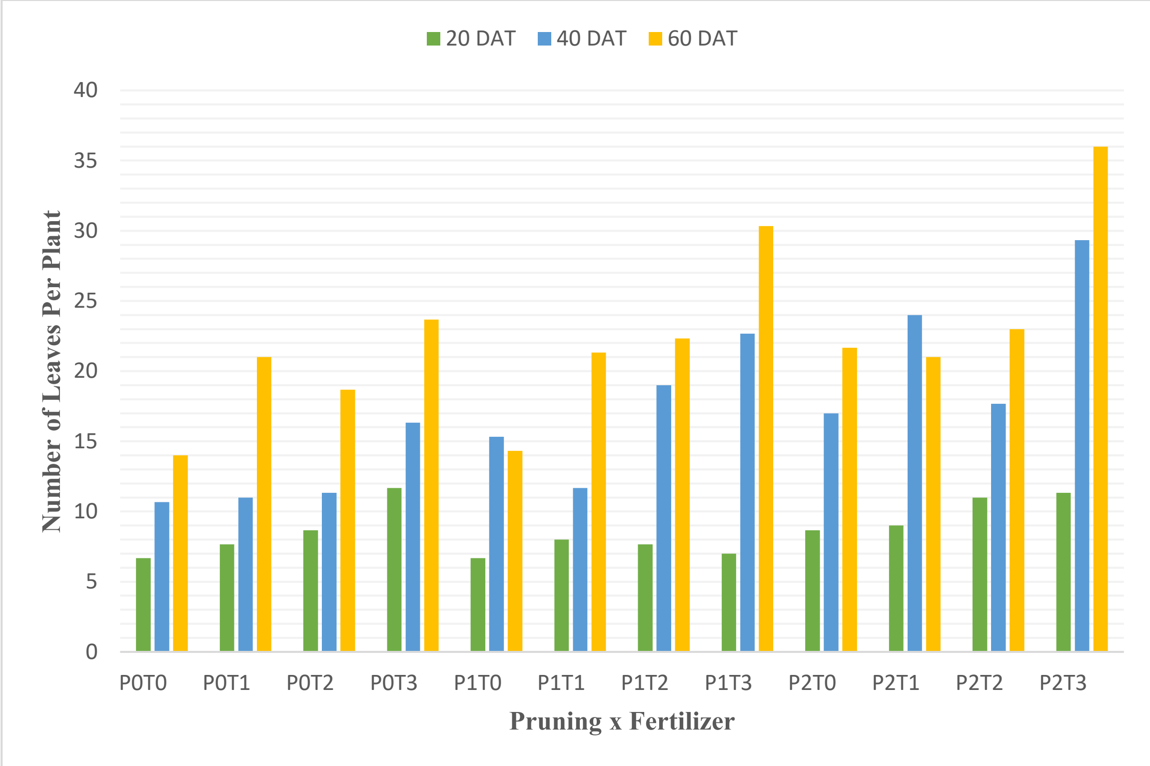

Figure 2: Influence of bud pruning and foliar application of zinc and boron on leaves per plant

DAT = Days after transplanting; T_0 = Control, T_1 = 0.2% Zn, T_2 = 0.2% B, T_3 = 0.2% (Zn + B); P_0 = No pruning, P_1 = Lateral bud pruning, P_2 = Apical bud pruning

4.3 Branches per plant

4.3.1 Influence of bud pruning

The positively significant effect of bud pruning was observed in number of branches plant^{-1}(Table 4). The range of branches was 5.08 to 6.50 at 20 DAT and 8.50 to 16.17at 40 DAT. The maximum number of branches plant^{-1} was found in P_2 treatment (6.50 and 16.17 at 20 DAT and 40 DAT respectively) compared to other treatments. This might be due to that, pruning helped for proper vegetative growth of brinjal plant**.** Mabokoet *al.* (2011), Ambroszczyk*et al.,* (2008) and M. R. Uddin *et al.* (1996) also reported the similar result.

4.3.2 Influence of foliar application of zinc and boron

Number of branches plant^{-1} was significantly influenced by foliar spray of zinc and boron application in brinjal. (Table 4). The highest number of branches was recorded in T_3 (6.67

and 16.22 at 20 DAT and 40 DAT respectively). The lowest values of this trait were found in T_2 (5.00) at 20 DAT and T_0 (10.11) at 40 DAT. The fact that foliar application of Zn and B helped to get higher vegetative growth in brinjal plants. The present finding is agreed with the finding of Z Abbas *et al.,* (2021), B Saha*et al.,* (2020) and Moghaddasi*et al.* (2017).

Table 4: Effect of bud pruning and foliar application of zinc and boron on branches per plant

Pruning	Branches Per Plant at different DAT	
	20	40
P_0	5.08 b	8.50 c
P_1	6.00 ab	11.67 b
P_2	6.50a	16.17 a
$LSD_{0.05}$	1.05	2.94
CV (%)	21.19	28.71
Fertilizer	**Branches Per Plant at different DAT**	
	20	**40**
T_0	5.67 ab	10.11 b
T_1	6.11 ab	11.11 b
T_2	5.00 b	11.00 b
T_3	6.67 a	16.22 a
$LSD_{0.05}$	1.21	3.39
CV (%)	21.19	28.71

DAT = Days after transplanting; T_0 = Control, T_1= 0.2% Zn, T_2 = 0.2% B, T_3 = 0.2% (Zn + B); P_0 = No pruning, P_1 = Lateral bud pruning, P_2 = Apical bud pruning

4.3.3 Combined effect of bud pruning and foliar application of zinc and boron

Combine effect of bud pruning and foliar fertilizations of zinc and boron showed a wide range of variation for number of branches plant-1at all sampling dates except at 20 DAT (Appendix VII). The highest number of primary branches plant-1 was found in P_2T_0 (8.67) at 20 DAT and P_2T_3 treatment combination showed highest data (22.67) at 40 DAT compared to other combinations. The lowest data was recorded from P_0T_0 (3.00,5.67) at 20 DAT, 40 DAT respectively (Figure 3).

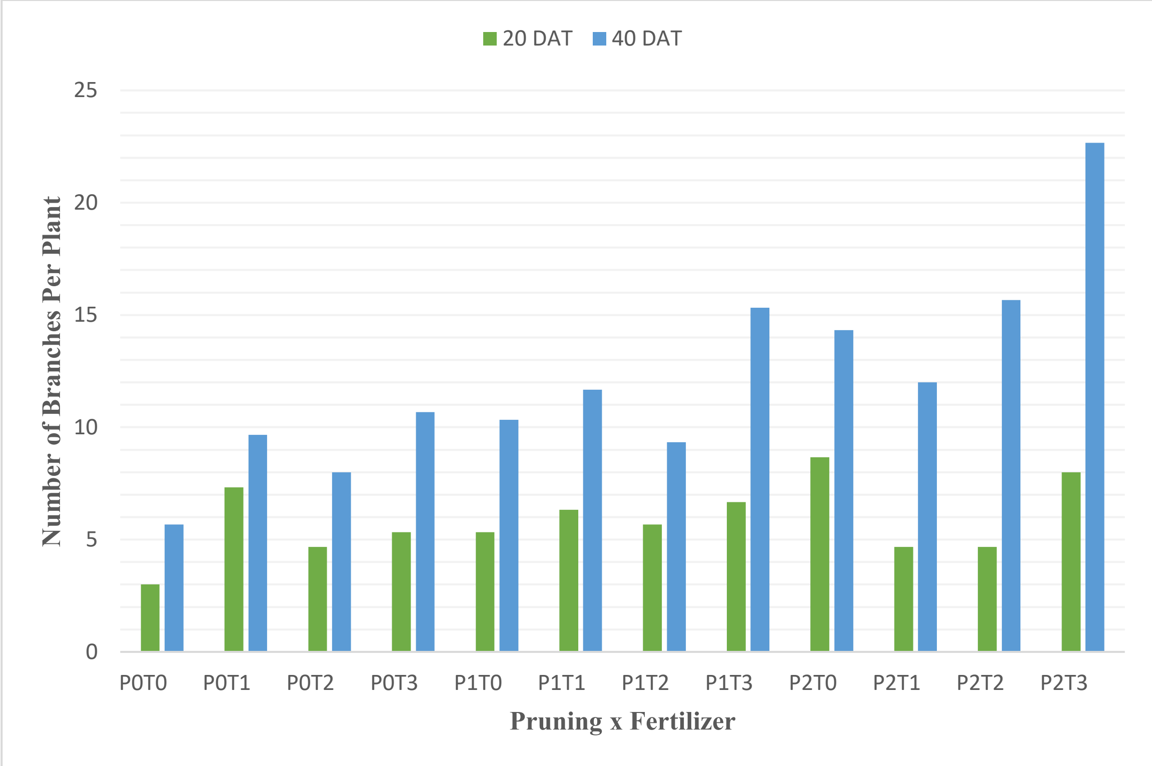

Figure 3: Influence of bud pruning and foliar application of zinc and boron on branches per plant

DAT = Days after transplanting; T_0 = Control, T_1 = 0.2% Zn, T_2 = 0.2% B, T_3= 0.2% (Zn + B); P_0 = No pruning, P_1 = Lateral bud pruning, P_2 = Apical bud pruning

4.4 Days required from transplanting to 1st flower initiation

4.4.1 Influence of bud pruning

Days from transplanting to 1st flower initiation showed statistically significant variation due to different types of bud pruning treatment (Table 5). The maximum days (46.67) from transplanting to 1st visible flower was recorded from P_0 (Control), whereas the minimum days (44.0) from transplanting to 1st visible flower was recorded from P_2 (Apical bud pruning) respectively (Table 5).The present finding is agreed with the finding of Singh *et al.* (1999) and Mabokoe*t al.* (2011).

4.4.2 Influence of foliar application of zinc and boron

Statistically significant variation due to different levels of foliar application of zinc and boron was recorded from transplanting to 1st flower initiation (Table 5). The maximum days required (47.33) from transplanting to 1st visible flower was recorded from T_0

(control), whereas the minimum days (42.44) from transplanting to 1st visible flower was recorded from T_3(0.2%Zn + 0.2%B). (Table 5).Thepresent finding is agreed with the finding of NM Kumar *et al.,* (2016) and AK Pandav *et al.,*(2016).

Table 5: Effect of bud pruning and foliar application of zinc and boron on 1st flowering days after transplanting (DAT)

Pruning	1st Flowering DAT
P_0	46.67 a
P_1	44.75 ab
P_2	44.00 b
$LSD_{0.05}$	2.04
CV (%)	5.35
Fertilizer	**1st Flowering DAT**
T_0	47.33 a
T_1	45.22 a
T_2	45.56 a
T_3	42.44 b
$LSD_{0.05}$	2.36
CV (%)	5.35

T_0 = Control, T_1 = 0.2% Zn, T_2 =0.2% B, T_3 = 0.2% (Zn + B); P_0 = No pruning, P_1 = Lateral bud pruning, P_2 = Apical bud pruning

4.4.3 Combined effect of bud pruning and foliar application of zinc and boron

Interaction effect of pruning and foliar application of zinc and boron showed statistically significant variation for days from transplanting 1st flower initiation (Appendix IX). The maximum days from transplanting to 1st flower initiation (51.33) was recorded from P_0T_0 (Control) and the minimum days from transplanting to 1stflower initiation (41.67) was recorded from P_2T_3 (Apical bud pruning + 0.2% Zn, B)(Figure 4).

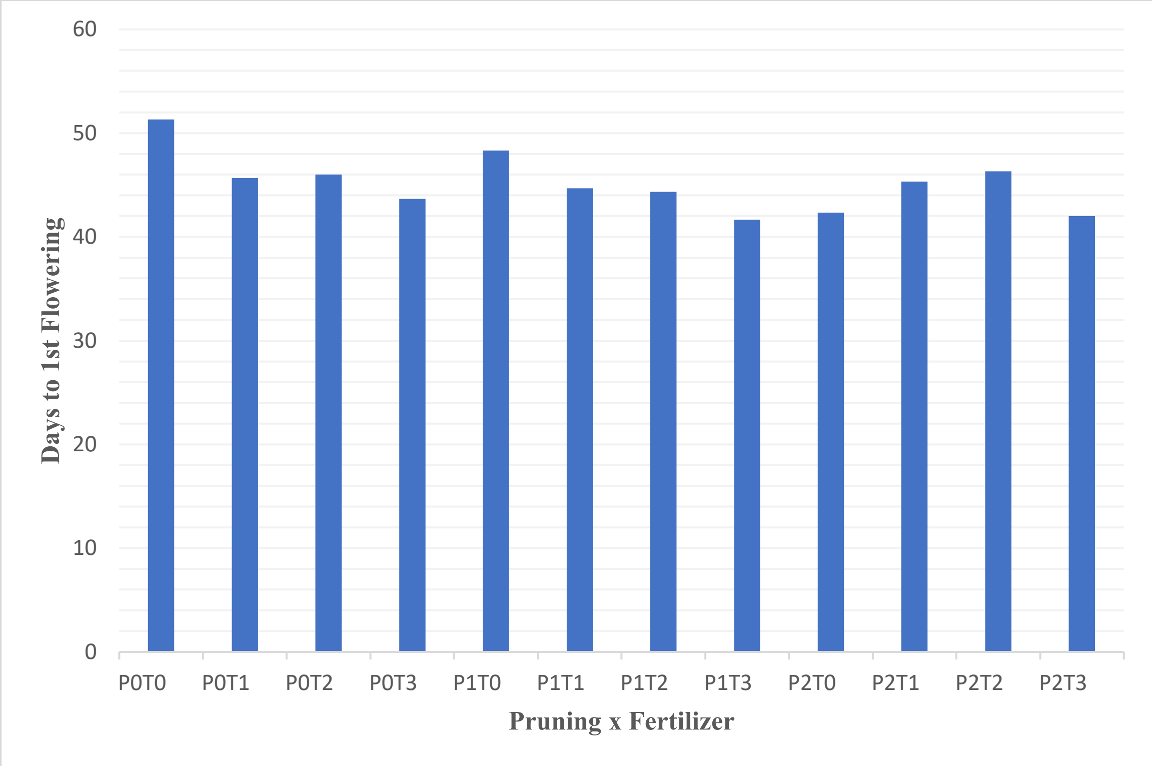

Figure 4: Influence of bud pruning and foliar application of zinc and boron on 1st flowering at days after transplanting (DAT)

DAT = Days after transplanting; T_0 = Control, T_1 = 0.2% Zn, T_2 = 0.2% B, T_3 = 0.2% (Zn + B); P_0 = No pruning, P_1 = Lateral bud pruning, P_2 = Apical bud pruning

4.5 Number of flowers per plant

4.5.1 Influence of bud pruning

Number of flowers per plant showed statistically significant variation due to different type of bud pruning treatment (Table 6). The highest number of flowers per plant (11.25 and 16.08) was recorded from P_2 (Apical bud pruning) at 40 DAT and 60 DAT respectively. While the lowest number of flowers per plant (7.33 and 12.50) was recorded from P_0 (Control) at 40 DAT and 60 DAT respectively(Table 6).

4.5.2 Influence of foliar application of zinc and boron

Significance difference was recorded due to different levels of foliar application of zinc and boron for number of flowers per plant (Table 6). The maximum number of flowers per plant (12.56 and 17.11) at 40 DAT and 60 DAT respectively was recorded from T_3 (0.2%Zn +0.2%B) while the minimum number of flowers per plant (6.78 and 11.56) at 40 DAT and

60 DAT respectively was recorded from T_0(Control) (Table 6).The present finding is agreed with the finding of Z Abbas *et al.,* (2021), NM Kumar *et al.,*(2016) and AK Pandav*et al.,*(2016).

Table 6: Effect of bud pruning and foliar application of zinc and boron on Flowers per plant

Pruning	**Flowers Per Plant at different DAT**	
	40	**60**
P_0	7.33 b	12.50 b
P_1	7.33 b	13.00 ab
P_2	11.25 a	16.08 a
$LSD_{0.05}$	2.17	3.18
CV (%)	29.68	27.11
Fertilizer	**Flowers Per Plant at different DAT**	
	40	**60**
T_0	6.78 b	11.56 b
T_1	6.67 b	13.89 ab
T_2	8.56 b	12.89 b
T_3	12.56 a	17.11 a
$LSD_{0.05}$	2.50	3.67
CV (%)	29.68	27.11

DAT = Days after transplanting; T_0 = Control, T_1 = 0.2% Zn, T_2 = 0.2% B, T_3 = 0.2% (Zn + B); P_0 = No pruning, P_1 = Lateral bud pruning, P_2 = Apical bud pruning

4.5.3 Combined effect of bud pruning and foliar application of zinc and boron

Interaction effect of bud pruning and foliar application of zinc and boron showed statistically significant variation for the number of flowers per plant (Appendix XI). The maximum number of flowers per plant (16.33 and 20.33) at 40 DAT and 60 DAT respectively was recorded from P_2T_3 (Apical bud pruning + 0.2% Zn,B), while the minimum number of flowers per plant (3.67 and 9) at 40 DAT and 60 DAT respectively was recorded from P_0T_0(Control)(Figure 5).

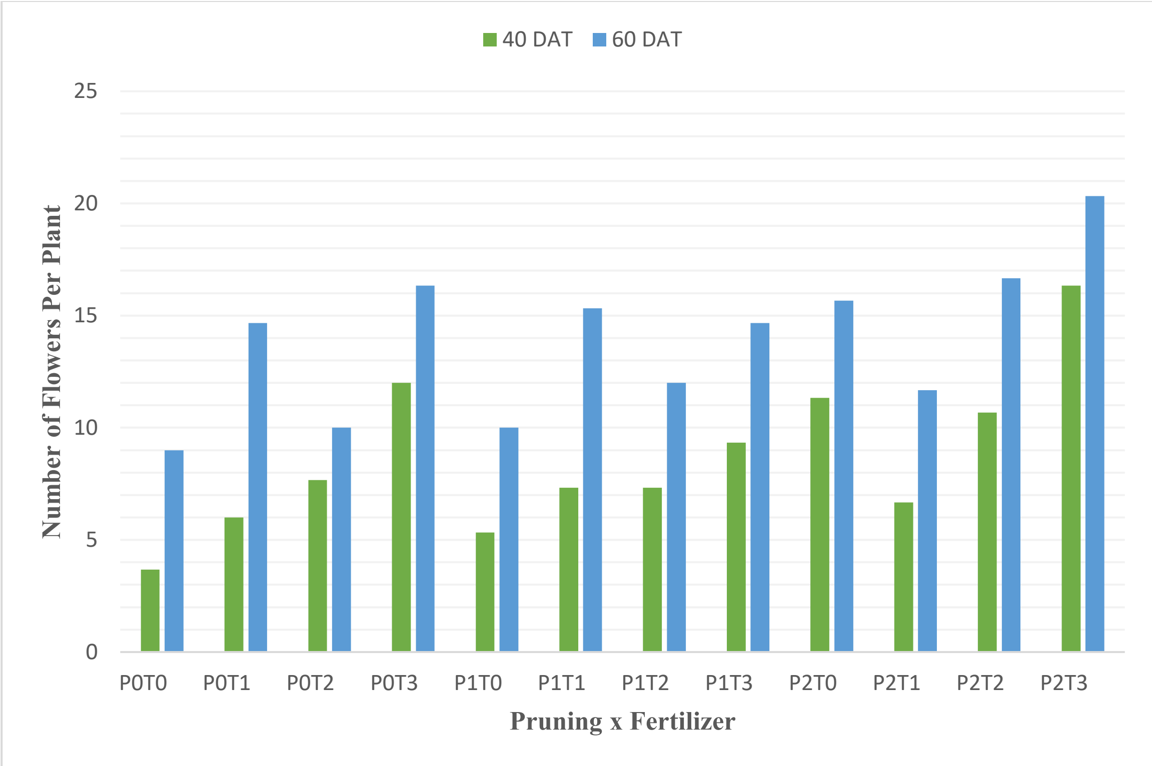

Figure 5: Influence of bud pruning and foliar application of zinc and boron on flowers per plant

DAT=Days after transplanting; T_0= Control, T_1= 0.2% Zn, T_2=0.2% B, T_3= 0.2% (Zn + B); P_0= No pruning, P_1= Lateral bud pruning, P_2= Apical bud pruning

4.6 Number of fruits per plant

4.6.1 Influence of bud pruning

Bud pruning activities significantly influenced on total number of fruits plant-1and showed that P_2 produced the highest number of fruits plant^{-1} (14.75) where control produced the lowest total number of fruits plant^{-1} (9.67) (Table 7). This might be due to the fact that pruning helps proper reproductive development of brinjal plants. A Hesami *et al.,* (2012), Maboko *et al.* (2011), Ambroszczyk*et al.,* (2008), Singh *et al.* (1999), Poksoy *et al.* (1993) also reported the similar result.

4.6.2 Influence of foliar application of zinc and boron

Foliar application of zinc and boron showed significantly positive influence on the total number of fruits plant^{-1} of brinjal on different days after transplanting (DAT). The highest value of total number of fruits plant^{-1} was recorded for T_3 (14.78) and lowest for

T_0(10)(Table 7). The foliar supply of Zn and B helped to get reproductive development of brinjal plants. The present finding is agreed with the findings of Z Abbas *et al.,* (2021), B Saha *et al.,* (2020), DJ Modi *et al.,* (2019), AK Pandav *et al.,* (2016).

Table 7: Effect of bud pruning and foliar application of zinc and boron on fruits per plant

Pruning	Fruits Per Plant
P_0	9.67 c
P_1	11.25 b
P_2	14.75 a
$LSD_{0.05}$	0.61
CV (%)	6.15
Fertilizer	**Fruits Per Plant**
T_0	10 d
T_1	11 c
T_2	11.78 b
T_3	14.78 a
$LSD_{0.05}$	0.71
CV (%)	6.15

DAT = Days after transplanting; T_0 = Control, T_1 = 0.2% Zn, T_2 = 0.2% B, T_3 = 0.2% (Zn + B); P_0 = No pruning, P_1 = Lateral bud pruning, P_2 = Apical bud pruning

4.6.3 Combined effect of bud pruning and foliar application of zinc and boron

Interaction effect of bud pruning and foliar application of zinc and boron showed statistically significant variation for the number of fruits per plant (Appendix XIII). The maximum number of fruits per plant (19.67) recorded from P_2T_3(Apical bud pruning + 0.2% Zn, B), while the minimum number of fruits per plant (6.00) was recorded from P_0T_0 (Control) (Figure 6).

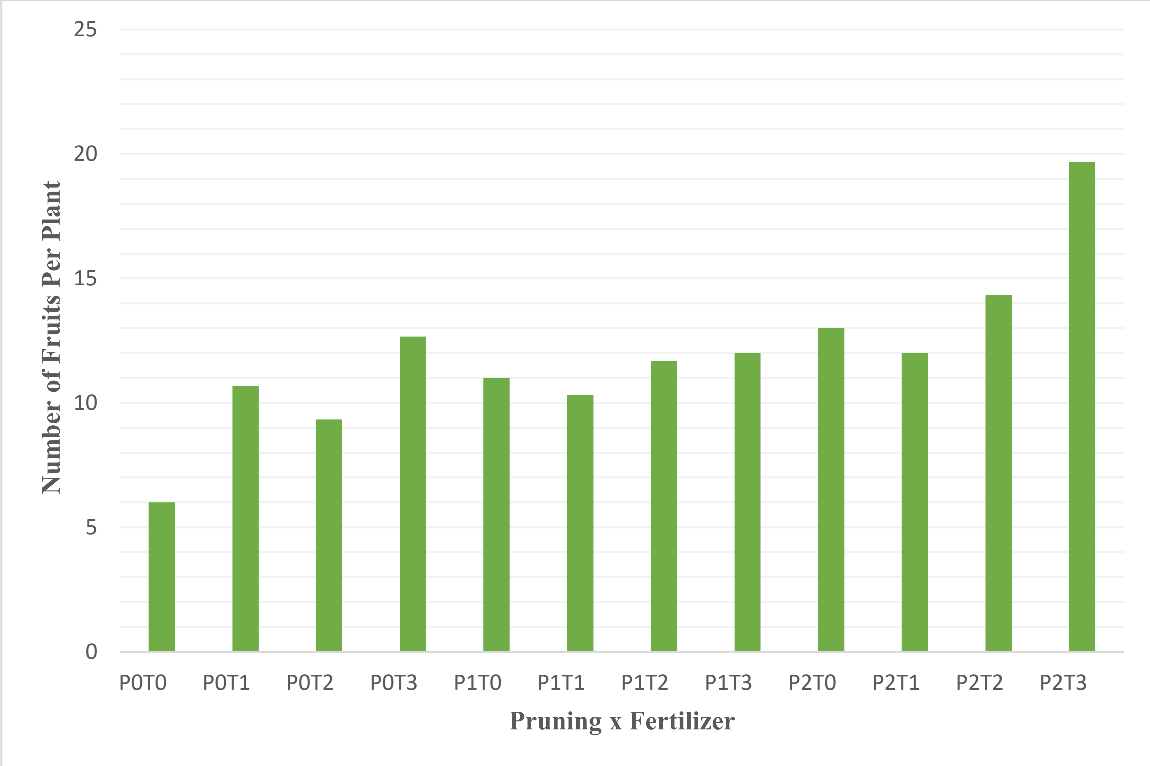

Figure 6: Influence of bud pruning and foliar application of zinc and boron on fruits per plant

DAT = Days after transplanting; T_0 = Control, T_1 = 0.2% Zn, T_2 = 0.2% B, T_3 = 0.2% (Zn + B); P_0 = No pruning, P_1 = Lateral bud pruning, P_2 = Apical bud pruning

4.7 Length of fruits (cm)

4.7.1 Influence of bud pruning

Length of fruits showed statistically significant variation due to different types of bud pruning (Table 8). The maximum length of fruits (19.89 cm) was recorded from P_2 (Apical bud pruning), while the minimum length of fruits per plant (14.83 cm) was recorded from P_0 (Control)(Table 8).This might be due to the fact that pruning helps proper reproductive development of brinjal plants. A. Hesami *et al.,* (2012), Ambroszczyk *et al.,* (2008), Singh *et al.* (1999), Poksoy *et al.* (1993) also reported the similar result.

4.7.2 Influence of foliar application of zinc and boron

A significant difference was recorded due to different levels of foliar application of zinc and boron for length of fruits (Appendix XV). The maximum length of fruit (18.72 cm) was recorded from T_3 (0.2%Zn +0.2%B), while the minimum length of fruit (15.39 cm) was recorded fromT_0 (Control) (Table 8).

Table 8: Effect of bud pruning and foliar application of zinc and boron on length of fruits (cm)

Pruning	Length of Fruits (cm)
P_0	14.83 c
P_1	16.38 b
P_2	19.89 a
$LSD_{0.05}$	0.77
CV (%)	5.36
Fertilizer	**Length of Fruits (cm)**
T_0	15.39 c
T_1	16.92 b
T_2	17.09 b
T_3	18.72 a
$LSD_{0.05}$	0.89
CV (%)	5.36

DAT = Days after transplanting; T_0 = Control, T_1 = 0.2% Zn, T_2 = 0.2% B, T_3 = 0.2% (Zn + B); P_0 = No pruning, P_1 = Lateral bud pruning, P_2 = Apical bud pruning

4.7.3 Combined effect of bud pruning and foliar application of zinc and boron

Interaction effect of bud pruning and foliar application of zinc and boron showed statistically significant variation for length of fruits (Appendix XV). The maximum length of fruit (22.50 cm) was recorded from P_2T_3 (Apical bud pruning + 0.2%Zn,B), while the minimum length of fruit (11.92 cm) per plant was recorded from P_0T_0(Control) (Figure 7).

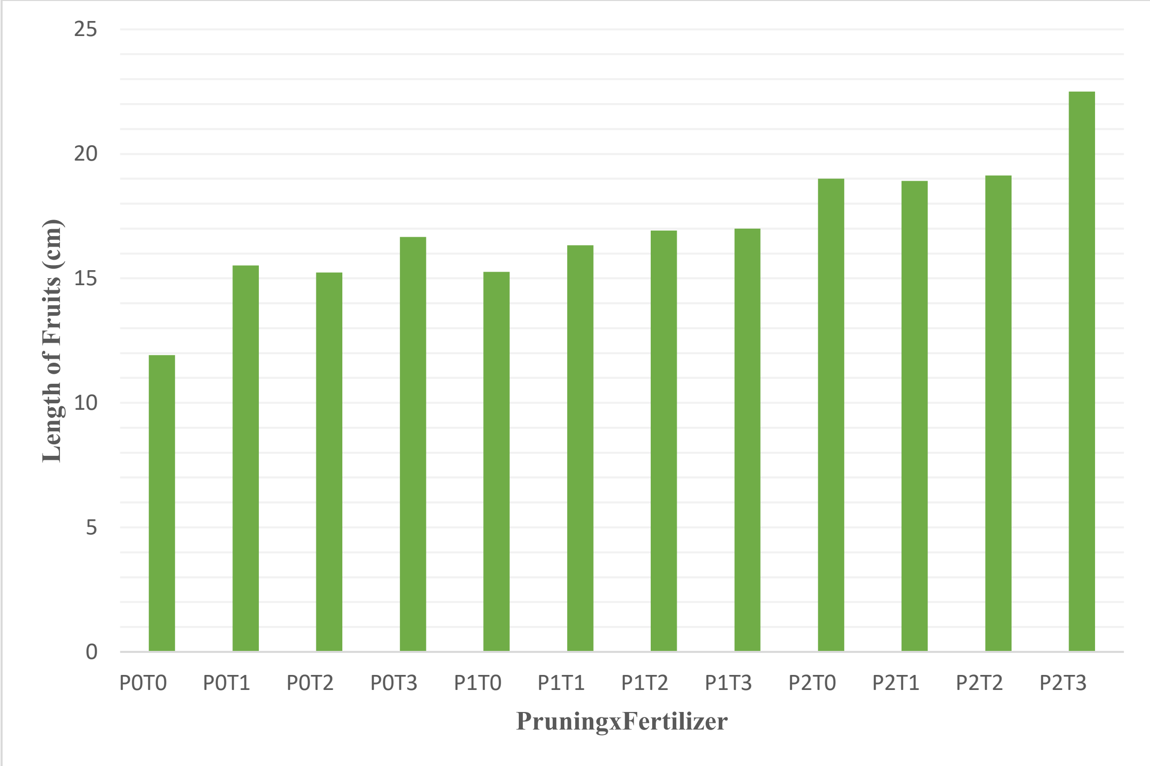

Figure 7: Influence of bud pruning and foliar application of zinc and boron on length of fruits (cm)

DAT = Days after transplanting; T_0 = Control, T_1 = 0.2% Zn, T_2 = 0.2% B, T_3 = 0.2% (Zn + B); P_0 = No pruning, P_1 = Lateral bud pruning, P_2 = Apical bud pruning

4.8 Diameter of fruits (cm)

4.8.1 Influence of bud pruning

Diameter of fruits varied significantly due to different types of bud pruning (Appendix XVI). The maximum diameter of fruit (9.92 cm) was recorded from P_2 (Apical bud pruning) and minimum diameter of fruit (6.44 cm) was recorded from P_0(Control)(Table 9).

4.8.2 Influence of foliar application of zinc and boron

Diameter of fruits varied significantly due to different levels of foliar application of zinc and boron for diameter of fruits (Appendix XVI). The maximum diameter of fruit (10.17 cm) was recorded from T_3 (0.2%Zn + 0.2%B), while the minimum diameter of fruit (7.31 cm) was recorded from T_0 (Control) (Table 9).

Table 9: Effect of bud pruning and foliar application of zinc and boron on diameter of fruits (cm)

Pruning	Diameter of Fruits (cm)
P_0	6.44 c
P_1	8.96 b
P_2	9.92 a
$LSD_{0.05}$	0.69
CV (%)	9.78
Fertilizer	**Diameter of Fruits (cm)**
T_0	7.31 c
T_1	7.94bc
T_2	8.33 b
T_3	10.17 a
$LSD_{0.05}$	0.80
CV (%)	9.78

DAT = Days after transplanting; T_0 = Control, T_1 = 0.2% Zn, T_2 = 0.2% B, T_3 = 0.2% (Zn + B); P_0 = No pruning, P_1 = Lateral bud pruning, P_2 = Apical bud pruning

4.8.3 Combined effect of bud pruning and foliar application of zinc and boron

Interaction effect of bud pruning and foliar application of zinc and boron showed statistically significant variation for diameter of fruits (Appendix XVI). The maximum diameter of fruit (10.92 cm) was recorded from P_2T_3 (Apical bud pruning + 0.2%Zn,B), while the minimum diameter of fruit (4.08 cm) was recorded from P_0T_0 (Control) (Figure 8).

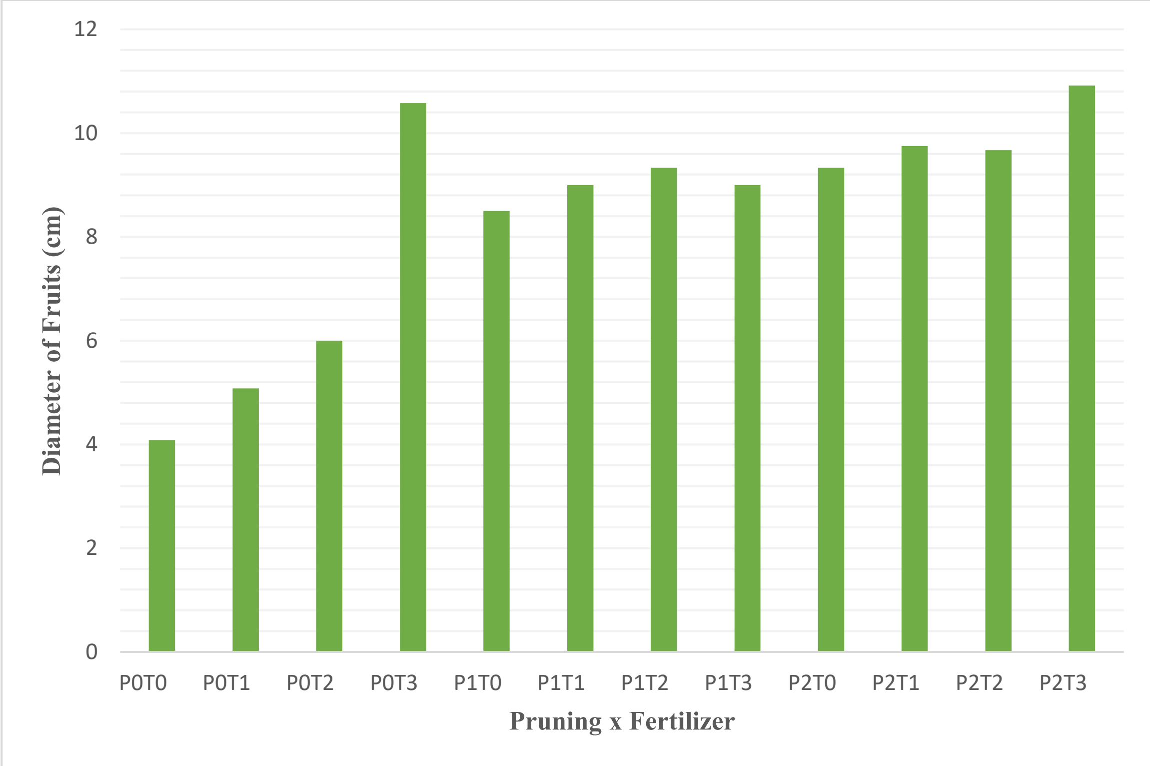

Figure 8: Influence of bud pruning and foliar application of zinc and boron on diameter of fruits (cm)

DAT=Days after transplanting; T_0= Control, T_1= 0.2% Zn, T_2=0.2% B, T_3= 0.2% (Zn + B); P_0= No pruning, P_1= Lateral bud pruning, P_2= Apical bud pruning

4.9 Weight of individual fruit (gm)

4.9.1 Influence of bud pruning

Weight of individual fruit varied significantly due to different types of bud pruning. The highest weight of fruit (148.24 gm) was recorded from P_2 (Apical bud pruning) and the lowest weight of individual fruit (94.38 gm) was recorded from P_0 (Control) (Table 10).

4.9.2 Influence of foliar application of zinc and boron

A statistically significant difference was recorded due to different levels of foliar application of zinc and boron for weight per fruit. The highest weight of individual fruit (167.84 gm) was recorded from T_3 (0.2%Zn + 0.2% B) while the lowest weight of fruit (106.63 gm) was recorded from T_0 (Control) (Table 10).

Table 10: Effect of bud pruning and foliar application of zinc and boron on weight per fruit (gm)

Pruning	Weight Per Fruit (gm)
P_0	112.70 c
P_1	127.21 b
P_2	148.24 a
$LSD_{0.05}$	3.06
CV (%)	2.80
Fertilizer	**Weight Per Fruit (gm)**
T_0	106.63 d
T_1	111.74 c
T_2	131.30 b
T_3	167.84 a
$LSD_{0.05}$	3.54
CV (%)	2.80

DAT = Days after transplanting; T_0 = Control, T_1 = 0.2% Zn, T_2 = 0.2% B, T_3 = 0.2% (Zn + B); P_0 = No pruning, P_1 = Lateral bud pruning, P_2 = Apical bud pruning

4.9.3 Combined effect of bud pruning and foliar application of zinc and boron

Interaction effect of bud pruning and foliar application of zinc and boron showed statistically significant variation for weight of fruits (Appendix XVII). The highest weight of fruit (212.55 gm) was recorded from P_2T_3 (Apical bud pruning + 0.2%Zn,B), while the lowest weight of fruit (94.38 gm) was recorded from P_0T_0 (Control) (Figure 9).

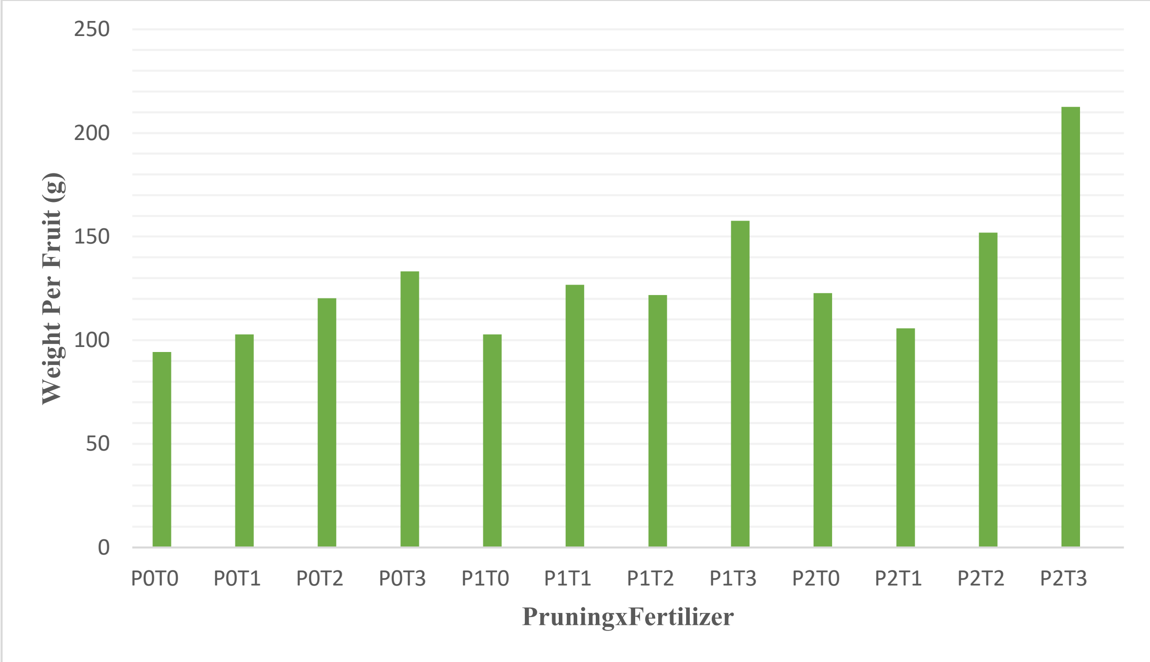

Figure 9: Influence of bud pruning and foliar application of zinc and boron on weight per fruit (g)

DAT=Days after transplanting; T_0= Control, T_1= 0.2% Zn, T_2=0.2% B, T_3= 0.2% (Zn + B); P_0= No pruning, P_1= Lateral bud pruning, P_2= Apical bud pruning

4.10 Yield per pot (kg)

4.10.1 Influence of bud pruning

Yield per pot in brinjal showed statistically significant variation due to different types of bud pruning (Appendix XVIII). The highest yield per pot (1.46 kg) was recorded from P_2(Apical bud pruning) and while the lowest yield per pot (0.86 kg) was recorded from P_0(Control)(Table 11).

4.10.2 Influence of foliar application of zinc and boron

A statistically significant difference was recorded due to different levels of foliar application of zinc and boron for yield per pot. The highest yield per pot was (1.49 kg) recorded from T_3 (0.2%Zn + 0.2%B), while the lowest yield per pot (0.85 kg) was recorded from T_0(Control) (Table 11). Foliar application of Zn and B increase cell growth and elongation and leads to bigger plants with longer shoots, leaves and maximum canopy in many plants with bigger yields. B Saha *et al.,* (2020) (Table 11).

Table 11: Effect of bud pruning and foliar application of zinc and boron on yield per pot (kg)

Pruning	Yield Per Pot (kg)
P_0	0.86 c
P_1	1.27 b
P_2	1.46 a
$LSD_{0.05}$	0.14
CV (%)	14.43
Fertilizer	**Yield Per Pot (kg)**
T_0	0.85 c
T_1	1.21 b
T_2	1.23 b
T_3	1.49 a
$LSD_{0.05}$	0.16
CV (%)	14.43

DAT = Days after transplanting; T_0 = Control, T_1 = 0.2% Zn, T_2 = 0.2% B, T_3 = 0.2% (Zn + B); P_0 = No pruning, P_1 = Lateral bud pruning, P_2 = Apical bud pruning

4.10.3 Combined effect of bud pruning and foliar application of zinc and boron

Interaction effect of bud pruning and foliar application of zinc and boron showed statistically significant variation for yield per pot (Appendix XVIII). The highest yield per pot (1.97 Kg) was recorded from P_2T_3(Apical bud pruning + 0.2%Zn,B),while the lowest yield per pot (0.45 kg) was recorded from P_0T_0(Control) (Figure 10).

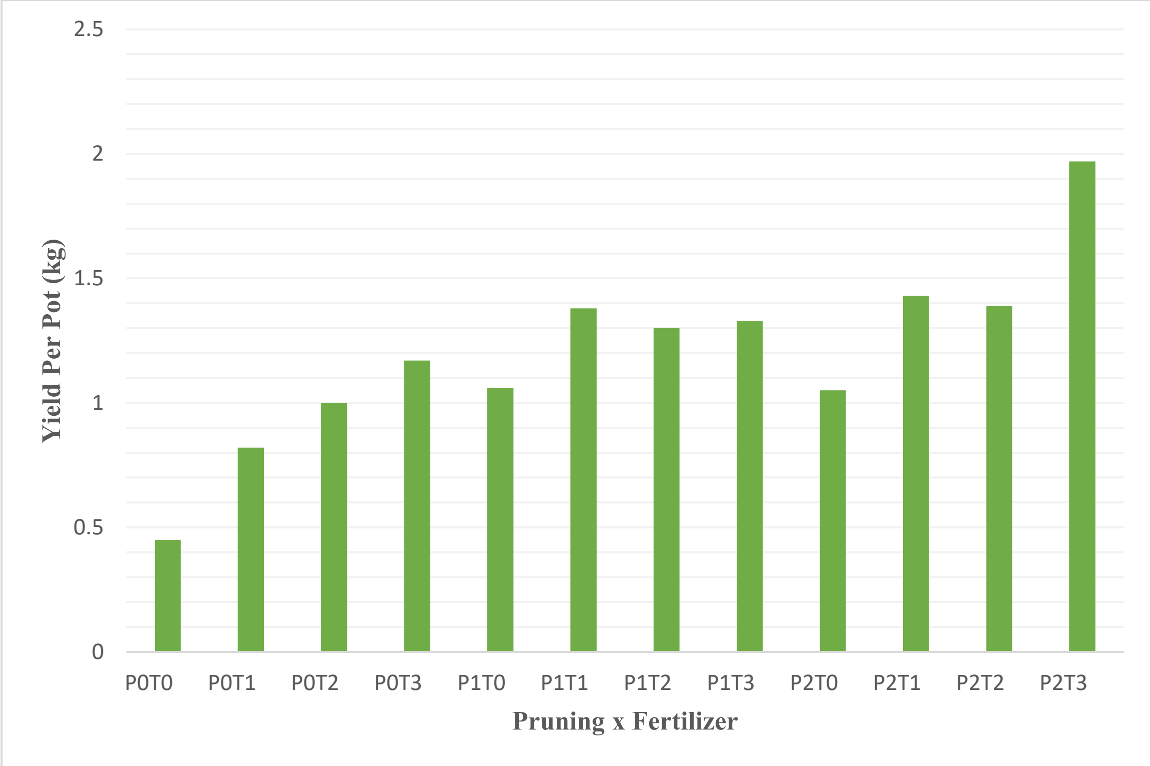

Figure 10: Influence of bud pruning and foliar application of zinc and boron on Yield Per Pot (kg)

DAT = Days after transplanting; T_0 = Control, T_1 = 0.2% Zn, T_2 = 0.2% B, T_3 = 0.2% (Zn + B); P_0 = No pruning, P_1 = Lateral bud pruning, P_2 = Apical bud pruning

4.11 Yield (t/ha)

4.11.1 Influence of bud pruning

Yield per hectare in brinjal showed statistically significant variation due to different types of bud pruning (Appendix XIX). The highest yield per hectare (27.93 ton) was recorded from P_2 (Apical bud pruning) and while the lowest yield per hectare (15.84 ton) was recorded from P_0 (Control) (Table 12).

4.11.2 Influence of foliar application of zinc and boron

A statistically significant difference was recorded due to different levels of foliar application of zinc and boron for yield per pot. The highest yield per hectare was (27.02 ton) recorded from T_3(0.2% Zn + 0.2% B), while the lowest yield per hectare (15.90 ton) was recorded from T_0 (Control) (Table 12). Foliar application of Zn and B increases cell growth and elongation and leads to bigger plants with longer shoots, leaves and maximum canopy in many plants with bigger yields. Saha et al., (2020)(Table 12).

Table 12: Effect of bud pruning and foliar application of zinc and boron on yield (t/ha)

Pruning	**Yield (t/ha)**
P_0	15.84 c
P_1	26.06 b
P_2	27.93 a
$LSD_{0.05}$	0.32
CV (%)	1.66
Fertilizer	**Yield (t/ha)**
T_0	15.90 c
T_1	25.20 b
T_2	24.98 b
T_3	27.02 a
$LSD_{0.05}$	0.37
CV (%)	1.66

DAT = Days after transplanting; T_0 = Control, T_1 = 0.2% Zn, T_2 = 0.2% B, T_3 = 0.2% (Zn + B); P_0 = No pruning, P_1 = Lateral bud pruning, P_2 = Apical bud pruning

4.11.3 Combined effect of bud pruning and foliar application of zinc and boron

Interaction effect of bud pruning and foliar application of zinc and boron showed statistically significant variation for yield per hectare (Appendix XIX). The highest yield per hectare (33.0 ton) was recorded from P_2T_3 (Apical bud pruning + 0.2% Zn, B), while the lowest yield per hectare (11.47 ton) was recorded from P_0T_0 (Control) (Figure 11).

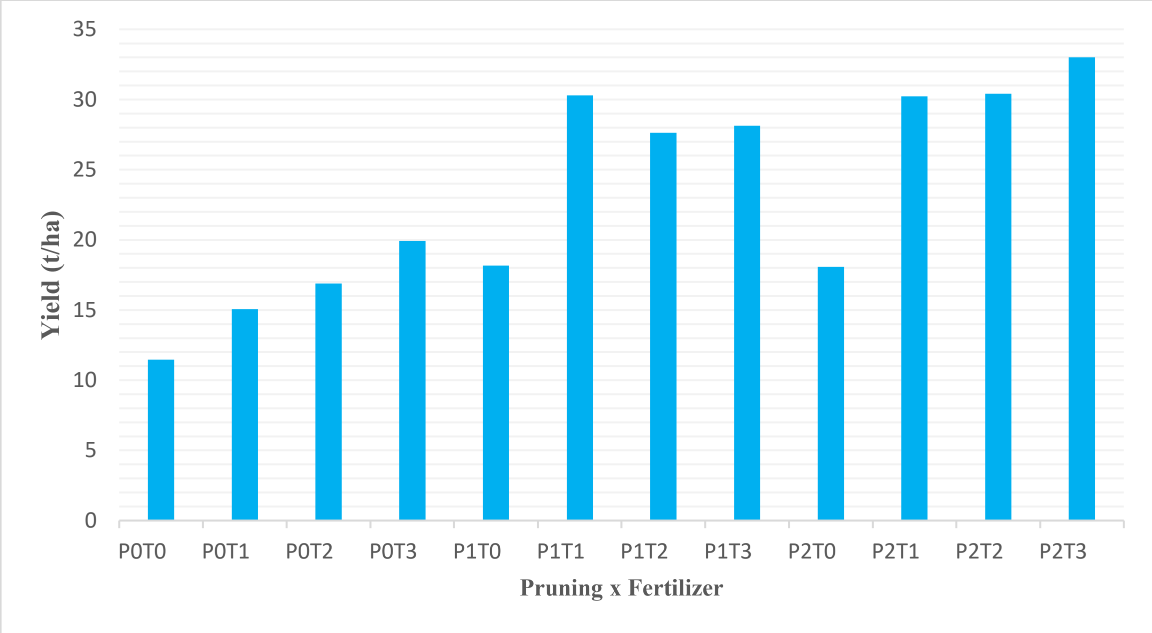

Figure 11: Influence of bud pruning and foliar application of Zn and B on Yield (t/ha)

DAT = Days after transplanting; T_0 = Control, T_1 = 0.2% Zn, T_2 = 0.2% B, T_3 = 0.2% (Zn + B); P_0 = No pruning, P_1 = Lateral bud pruning, P_2 = Apical bud pruning

Table 13: Effect of bud pruning and foliar application of zinc and boron on fruit length, fruit diameter, individual fruit weight, yield/pot, yield/hectare on brinjal

Pruning	**Length of fruits (cm)**	**Diameter of Fruits (cm)**	**Weight Per Fruit (gm)**	**Yield Per Pot (kg)**	**Yield (t/ha)**
P_0	14.83 c	6.44 c	112.70 c	0.86 c	15.84 c
P_1	16.38 b	8.96 b	127.21 b	1.27 b	26.06 b
P_2	19.89 a	9.92 a	148.24 a	1.46 a	27.93 a
$LSD_{0.05}$	0.77	0.69	3.06	0.14	0.32
CV (%)	5.36	9.78	2.80	14.43	1.66
Fertilizer	**Length of Fruits (cm)**	**Diameter of Fruits (cm)**	**Weight Per Fruit (gm)**	**Yield Per Pot (kg)**	**Yield (t/ha)**
T_0	15.39 c	7.31 c	106.63 d	0.85 c	15.90 c
T_1	16.92 b	7.94bc	111.74 c	1.21 b	25.20 b
T_2	17.09 b	8.33 b	131.30 b	1.23 b	24.98 b
T_3	18.72 a	10.17 a	167.84 a	1.49 a	27.02 a
$LSD_{0.05}$	0.89	0.80	3.54	0.16	0.37
CV (%)	5.36	9.78	2.80	14.43	1.66

CHAPTER V

CHAPTER V

SUMMARY AND CONCLUSION

The experiment was conducted at the Horticulture Farm of Sher-e-Bangla Agricultural University (SAU), Dhaka during the period from April to September 2021 to find out the influence of bud pruning and foliar application of Zinc and Boron on growth, flowering and yield of brinjal. Seedlings of 30 days of BARI begun-8 were used as test crop. The experiment consisted of two factors: Factor A: Three types of pruning treatment such as (i) P_0: No pruning, (ii) P_1: Lateral bud pruning, (iii) P_2: Apical bud pruning, and Factor B: Four concentrations of foliar application of Zn and B (i) T_0: Control, (ii)T_1: 0.2% Zn application (iii)T_2: 0.2% B application, (iv)T_3: 0.2%Zn + 0.2% B application. The two-factor experiment was laid out in randomized complete block design (RCBD) with three replications. Data on different growth and yield parameters were recorded and statistically significant variation was found for different types of bud pruning and foliar application of zinc and boron and their combined effect. At 20, 40 and 60 DAT the tallest plant (11.25 cm, 21.08 cm and 37.91 cm) was recorded from P_2 (Apical bud pruning), whereas the shortest plant (8.83 cm, 15.58 cm and 23.50 cm) from P_0 (No pruning). At 20, 40 and 60 DAT the maximum number of leaves per plant (10, 22 and 25.42) was found fromP_2, whereas the minimum number (8.67,12.33 and 19.33) from P_0. The minimum days from transplanting to 1st flowering (44 days) were recorded from P_2 and the maximum days (46.67 days) from P_0. The highest number of flowers per plant (11.25 and 16.08) was found from P_2, while the lowest number (7.33 and 12.50) from P_0 at 40 and 60 DAT respectively. The highest number of fruits per plant (14.75) was recorded from P_2 and the lowest number (9.67) from P_0.

The highest length of fruit (19.89 cm) was found from P_2, whereas the lowest length (14.83 cm) from P_0. The highest diameter of fruit (9.92 cm) was recorded from P_2 whereas the lowest diameter (6.44 cm) from P_0. The highest weight per fruit (148.24 gm) was recorded from P_2, whereas the lowest (112.70 gm) from P_0. The highest yield per pot (1.46 kg) was recorded from P_2 while the lowest yield (0.86 kg) from P_0. The highest yield ton per hectare (27.93 ton) was recorded from P_2 , while the lowest yield ton per hectare (15.84 ton) was recorded from $P_{0.}$ At 20, 40 and 60 DAT the tallest plant (11.33cm, 22.11 cm and 38.44 cm) was recorded from T_3(0.2% Zn + 0.2% B), whereas the shortest plant (8.89 cm, 15.78 cm and 25.78 cm) fromT_0 (Control). At 20, 40 and 60 DAT maximum number of leaves per plant (10, 22.78 and 30) was found from T_3 whereas the minimum number (7.33, 14.33 and 16.67) from T_0. The maximum days from transplanting to 1st flowering (47.33) were recorded from T_0 and the minimum days (42.44) from T_3. The highest number of flowers per plant (12.56 and 17.11) was found from T_3, while the lowest number (6.78 and 11.56) from T_0 at 40 and 60 DAT respectively. The highest number of fruits per plant (14.78) was recorded from T_3 and the lowest number (10.00) from T_0. The highest length of fruit (18.72 cm) was obtained from T_3 whereas the lowest length (15.39 cm) from. The highest diameter of fruit (10.17 cm) was recorded from T_3whereas the lowest diameter (7.31 cm) from. The highest weight of individual fruit (167.84 gm) was recorded from T_3 whereas the lowest (106.63 gm) from T_0. The highest yield per pot (1.49 kg) was recorded from T_3 while the lowest yield (0.85 kg) from T_0.The highest yield ton per hectare (27.02 ton) was recorded from T_3 while the lowest yield ton per hectare (15.90 ton) from T_0.At 20, 40 and 60 DAT the tallest plant (16.33 cm, 29.67 cm and 56.00 cm) was recorded from P_2T_3(Apical bud pruning +0.2% zn,0.2%B application) whereas the shortest plant (5 cm, 10 cm and 17.67 cm) from P_0T_0 (Control condition).

At 20, 40 and 60 DAT the maximum number of leaves per plant (11.33, 29.33 and 36) were found from P_2T_3 whereas the minimum number (6.67, 10.67and 14) from P_0T_0. The maximum days from transplanting to 1st flowering (51.33) was recorded from P_0T_0 and the minimum days (42) from P_2T_3. The highest number of flowers per plant (16.33 and 20.33) was found from P_2T_3 while the lowest number (3.67 and 9) from P_0T_0 at 40 and 60 DAT respectively. The highest number of fruits per plant (19.67) was recorded from P_2T_3 and the lowest number (6.00) from P_0T_0. The highest length of fruit (22.50 cm) was attained from P_2T_3 whereas the lowest length (11.92 cm) from P_0T_0. The highest diameter of fruit (10.92 cm) was recorded from P_2T_3 whereas the lowest diameter (4.08 cm) from P_0T_0. The highest weight per fruit (212.55 gm) was recorded from P_2T_3, while the lowest (94.38 gm) from P_0T_0. The highest yield per pot (1.97 kg) was recorded from P_2T_3 while the lowest yield (0.45 kg) from P_0T_0.The highest yield ton per hectare (33.00ton) was recorded from P_2T_3 while the lowest yield ton per hectare (11.47ton) from P_0T_0.

Above findings revealed that apical bud pruning and foliar combined application of 0.2% (Zn, B) was suitable in consideration of yield contributing characters and yield of brinjal plant.

Conclusion

It can be concluded that the crop treated with P2 (pinching of apical bud) gave the best results in vegetative growth and reproduction. T3 (Foliar application of 0.2% Zn and 0.2% B) performed the best results in case of vegetative growth and reproductive stage. Better vegetative growth, reproduction and yield were found in brinjal treated with P2T3.

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APPENDICES

Appendix I. Monthly recorded the average air temperature, rainfall, relative humidity and sunshine of the experimental site during the period from April to May 2021.

Month	Air temperature (^{0}C)		Relative Humidity (%)	Total rainfall (mm)	Sunshine (hr.)
	Maximum	Minimum			
March, 2021	32.5	20.4	64	65.8	5.9
June, 2021	35.7	26.6	75	180.3	6.2

Source: Sher-e-Bangla Agricultural University Weather Station.

Appendix II. Physical characteristics & chemical composition of soil of the experimental plot.

Soil characteristics	Analytical results
Agrological Zone	Madhupur Tract
pH	6.00-6.63
Organic mater	0.84
Total N (%)	0.46
Available phosphorous	21 ppm
Exchangeable K	0.41meq / 100 g soil

Source: Soil resource and development institute (SRDI), Dhaka

Appendix III. Anova of influence ofbud pruning and foliar application of zinc and boron on height per plant (cm)

Source of variation	Degrees of freedom	Mean square		
		Height Per Plant (cm) at		
		20 DAT	40 DAT	60 DAT
Replication	2	5.86	45.25	6.083
Pruning	2	24.19	91.00	662.583
Fertilizer	3	13.81	69.58	313.556
Pruning x Fertilizer	6	32.89	43.44	143.139
Error	22	8.52	13.12	6.598

Appendix IV. Combined effect of bud pruning and foliar application of zinc and boron on height per plant (cm) at different days after transplanting (DAT)

Pruning x Fertilizer	Height Per Plant (cm) at different DAT		
	20	40	60
P_0T_0	5.00 c	10.00 c	17.67 g
P_0T_1	12.00 ab	17.00 b	24.00ef
P_0T_2	8.00 bc	16.67 b	21.00fg
P_0T_3	10.33 b	18.67 b	31.33bcd
P_1T_0	9.67 bc	18.00 b	27.33 de
P_1T_1	7.67 bc	15.67 bc	31.33bcd
P_1T_2	10.33 b	20.67 b	23.67ef
P_1T_3	7.33 bc	18.00 b	28.00cde
P_2T_0	12.00 ab	19.33 b	32.33bc
P_2T_1	9.33 bc	17.67 b	27.67 de
P_2T_2	7.33 bc	17.67 b	35.67 b
P_2T_3	16.33 a	29.67 a	56.00 a
$LSD_{0.05}$	4.94	6.13	4.34
CV(%)	30.38	19.85	8.66

AppendixV. Anova of influence of bud pruning and foliar application of zinc and boron on leaves per plant (cm)

Source of variation	Degrees of freedom	Mean square		
		Leaves Per Plant at		
		20 DAT	40 DAT	60 DAT
Replication	2	7.00	5.58	6.69
Pruning	2	21.33	280.33	111.36
Fertilizer	3	11.85	130.40	280.11
Pruning x Fertilizer	6	4.40	29.96	25.25
Error	22	2.87	6.28	3.60

Appendix VI. Combined effect of bud pruning and foliar application of zinc and boron on leaves per plant at different days after transplanting(DAT)

Pruning x Fertilizer	Leaves Per Plant at different DAT		
	20	40	60
P_0T_0	6.67 c	10.67 f	14.00 e
P_0T_1	7.67 c	11.00 f	21.00 cd
P_0T_2	8.67 bc	11.33 ef	18.67 d
P_0T_3	11.67 a	16.33 d	23.67 c
P_1T_0	6.67 c	15.33 de	14.33 e
P_1T_1	8.00 c	11.67 ef	21.33 cd

P_1T_2	7.67 c	19.00 cd	22.33 c
P_1T_3	7.00 c	22.67 bc	30.33 b
P_2T_0	8.67 bc	17.00 d	21.67 cd
P_2T_1	9.00 abc	24.00 b	21.00 cd
P_2T_2	11.00 ab	17.67 d	23.00 c
P_2T_3	11.33 ab	29.33 a	36.00 a
$LSD_{0.05}$	2.87	4.24	3.21
CV(%)	19.58	14.60	8.52

AppendixVII. Anova of influence of bud pruning and foliar application of zinc and boron on branches per plant (cm)

Source of variation	Degrees of freedom	Mean square	
		Branches Per Plant at	
		20 DAT	40 DAT
Replication	2	0.36	0.36
Pruning	2	6.19	178.11
Fertilizer	3	4.47	69.40
Pruning x Fertilizer	6	9.97	14.40
Error	22	1.54	12.08

Appendix VIII. Combined effect of bud pruning and foliar application of zinc and boron on branches per plant at different days after transplanting (DAT)

Pruning x Fertilizer	Branches Per Plant at different DAT	
	20	40
P_0T_0	3.00 e	5.67 f
P_0T_1	7.33 abc	9.67 cdef
P_0T_2	4.67 de	8.00 ef
P_0T_3	5.33 cd	10.67 bcdef
P_1T_0	5.33 cd	10.33 bcdef
P_1T_1	6.33 bcd	11.67 bcde
P_1T_2	5.67 cd	9.33 def
P_1T_3	6.67 abcd	15.33 bc
P_2T_0	8.67 a	14.33 bcd
P_2T_1	4.67 de	12.00 bcde
P_2T_2	4.67 de	15.67 b
P_2T_3	8.00 ab	22.67 a
$LSD_{0.05}$	2.10	5.88
CV(%)	21.19	28.71

AppendixIX. Anova of influence of bud pruning and foliar application of zinc and boron on 1st flowering days after transplanting (DAT)

Source of variation	Degrees of freedom	Mean square
		1st Flowering DAT
Replication	2	0.19
Pruning	2	22.69
Fertilizer	3	36.76
Pruning*Fertilizer	6	15.99
Error	22	5.83

Appendix X. Combined effect of bud pruning and foliar application of zinc and boron on 1st flowering at days after transplanting (DAT)

Pruning x Fertilizer	1st Flowering DAT
P_0T_0	51.33 a
P_0T_1	45.67 bcde
P_0T_2	46.00 bcd
P_0T_3	43.67 cde
P_1T_0	48.33 ab
P_1T_1	44.67 bcde
P_1T_2	44.33 bcde
P_1T_3	41.67 e
P_2T_0	42.33 cde
P_2T_1	45.33 bcde
P_2T_2	46.33 bc
P_2T_3	42.00 de
$LSD_{0.05}$	4.08
CV(%)	5.35

AppendixXI. Anova of influence of bud pruning and foliar application of zinc and boron on flowers per plant

Source of variation	Degrees of freedom	Mean square	
		Flowers Per Plant at	
		40 DAT	60 DAT
Replication	2	12.02	98.36
Pruning	2	61.36	45.19
Fertilizer	3	68.10	50.47
Pruning*Fertilizer	6	12.10	21.86
Error	22	6.57	14.11

Appendix XII. Combined effect of bud pruning and foliar application of zinc and boron on flowers per plant at different days after transplanting (DAT)

Pruning x Fertilizer	Flowers Per Plant at different DAT	
	40	60
P_0T_0	3.67 f	9.00 d
P_0T_1	6.00 ef	14.67 abcd
P_0T_2	7.67 bcdef	10.00 cd
P_0T_3	12.00 ab	16.33 abc
P_1T_0	5.33 ef	10.00 cd
P_1T_1	7.33 cdef	15.33 abcd
P_1T_2	7.33 cdef	12.00 bcd
P_1T_3	9.33 bcde	14.67 abcd
P_2T_0	11.33 bc	15.67 abc
P_2T_1	6.67 def	11.67 bcd
P_2T_2	10.67 bcd	16.67 ab
P_2T_3	16.33 a	20.33 a
$LSD_{0.05}$	4.34	6.36
CV(%)	29.68	27.11

AppendixXIII. Anova of influence of bud pruning and foliar application of zinc and boron on fruits per plant

Source of variation	Degrees of freedom	Mean square
		Fruits Per Plant
Replication	2	1.44
Pruning	2	81.19
Fertilizer	3	38.15
Pruning*Fertilizer	6	11.01
Error	22	0.54

AppendixXIV. Combined effect of bud pruning and foliar application of zinc and boron on fruits per plant

Pruning* Fertilizer	Fruits Per Plant
P_0T_0	6.00i
P_0T_1	10.67fg
P_0T_2	9.33 h
P_0T_3	12.67 cd
P_1T_0	11.00efg
P_1T_1	10.33gh

P_1T_2	11.67 def
P_1T_3	12.00cde
P_2T_0	13.00 c
P_2T_1	12.00cde
P_2T_2	14.33 b
P_2T_3	19.67 a
$LSD_{0.05}$	1.23
CV(%)	6.15

AppendixXV. Anova ofinfluence of bud pruning and foliar application of zinc and boron on lengthof fruits (cm)

Source of variation	Degrees of freedom	Mean square
		Length of Fruits (cm)
Replication	2	3.72
Pruning	2	80.49
Fertilizer	3	16.66
Pruning*Fertilizer	6	3.44
Error	22	0.83

AppendixXVI. Anova of influence of bud pruning and foliar application of zinc and boron on diameter of fruits (cm)

Source of variation	Degrees of freedom	Mean square
		Diameter of Fruits (cm)
Replication	2	3.97
Pruning	2	38.76
Fertilizer	3	13.56
Pruning*Fertilizer	6	6.48
Error	22	0.68

AppendixXVII. Anova of influence of bud pruning and foliar application of zinc and boron on weight per fruit (gm)

Source of variation	Degrees of freedom	Mean square
		Weight Per Fruit (gm)
Replication	2	8.97
Pruning	2	3832.72
Fertilizer	3	6934.59
Pruning*Fertilizer	6	1070.69
Error	22	13.11

Appendix XVIII. Anova of influence of bud pruning and foliar application of zinc and boron on yield per pot (kg)

Source of variation	Degrees of freedom	Mean square
		Yield Per Pot (kg)
Replication	2	0.11
Pruning	2	1.11
Fertilizer	3	0.62
Pruning x Fertilizer	6	0.08
Error	22	0.02

Appendix XIX. Anova of influence of bud pruning and foliar application of zinc and boron on yield (t/ha)

Source of variation	Degrees of freedom	Mean square
		Yield (t/ha)
Replication	2	1.76
Pruning	2	507.74
Fertilizer	3	225.11
Pruning x Fertilizer	6	16.97
Error	22	0.15

Appendix XX. Combined effect of bud pruning and foliar application of zinc and boron on fruit length, fruit diameter, individual fruit weight, yield/pot, yield/hectare on brinjal

Pruning x Fertilizer	Length of Fruits (cm)	Diameter of Fruits (cm)	Weight Per Fruit (gm)	Yield Per Pot (kg)	Yield (t/ha)
P_0T_0	11.92 e	4.08 e	94.38 g	0.45 f	11.47
P_0T_1	15.52 cd	5.08 de	102.83 f	0.82 e	15.07
P_0T_2	15.23 d	6.00 d	120.27 e	1.00 de	16.90
P_0T_3	16.67 cd	10.58 ab	133.30 c	1.17 bcd	19.93
P_1T_0	15.27 d	8.50 c	102.73 f	1.06cde	18.17
P_1T_1	16.33 cd	9.00 c	126.67 d	1.38 b	30.30
P_1T_2	16.92 c	9.33bc	121.74 de	1.30 bc	27.63
P_1T_3	17.00 c	9.00 c	157.68 b	1.33 bc	28.13
P_2T_0	19.00 b	9.33bc	122.79 de	1.05cde	18.07
P_2T_1	18.92 b	9.75abc	105.73 f	1.43 b	30.23
P_2T_2	19.13 b	9.67abc	151.89 b	1.39 b	30.40
P_2T_3	22.50 a	10.92 a	212.55 a	1.97 a	33.00
$LSD_{0.05}$	1.54	1.39	6.13	0.29	0.65
CV(%)	5.36	9.78	2.80	14.43	1.66

PLATES

Plate 1: Seedlings of eggplant sprouted from seeds on seedbed

Plate 2: Soil mixing with compost, manure and fertilizers for main bed (pot filling)

Plate 3: Experimental plot

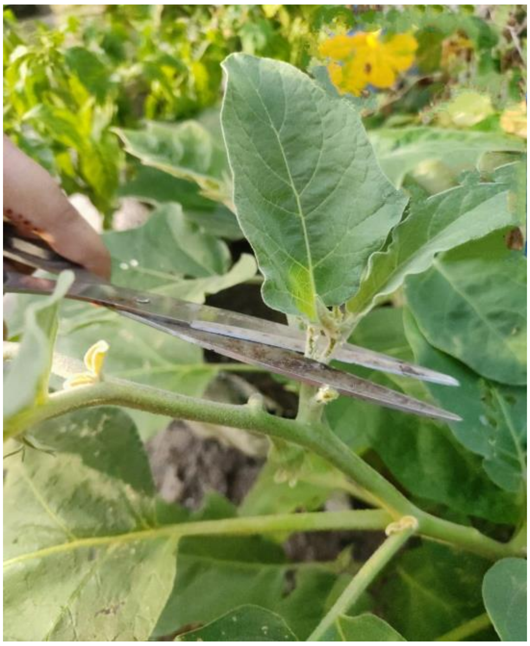

Plate 4: Apical bud pruning operation

Plate 5: Lateral bud pruning operation

Plate 6: Foliar spraying with 0.2% (Zn and B)

Plate 7: First flower and fruits initiation

Plate 8: Plant with mature fruits

Plate 9: Measuring fruits weight per pant (kg)