A STUDY ON MORPHOLOGICAL CHARACTERSTICS AND YIELD OF SOME BRINJAL VARIETIES

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A STUDY ON MORPHOLOGICAL CHARACTERSTICS AND YIELD OF SOME BRINJAL VARIETIES

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CERTIFICATE

*This is to certify that the thesis entitled, "**A STUDY ON MORPHOLOGICAL CHARACTERSTICS AND YIELD OF SOME BRINJAL VARIETIES**" submitted to the Department of Agricultural Botany, Faculty of Agriculture, Sher-e-Bangla Agricultural University, Dhaka in partial fulfillment of the requirements for the degree of **MASTER OF SCIENCE in AGRICULTURAL BOTANY**, embodies the results of a piece of bona fide research work carried out by **MD. RUHUL AMIN, Registration No. 08-02815** under my supervision and my 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.

Dated: June, 2016

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DEDICATED TO
MY
BELOVED PARENTS

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ABSTRACT

An experiment was carried out at the Research Farm of Sher-e-Bangla Agricultural University, Dhaka during March to October, 2014 to study the morphological characteristics and yield of brinjal varieties. The experiment included eight varieties *viz.*, Green Round, Bankim Purple Long, Debjhuri Hajari, Black Magic, Muktojhuri, Green Express, Black Boy and Tal Begun. The experiment was laid out in Randomized complete Block Design (RCBD) with three replications. The brinjal variety, Green Express showed superiority over the rest varieties in most of the morphological parameters, yield components and yield. The highest plant height (60.67 cm), number of branches plant^{-1} (8.33), number of leaves plant^{-1} (77.00) and maximum individual leaf area (200.00 cm^2) were observed in variety Green Express. The same variety accumulated the maximum amount of chlorophyll (6.57 mg g^{-1}) in its leaves and which was closely followed by Black Magic (6.10). The maximum number of flowers plant^{-1} (41.00) and number of fruits cluster^{-1} (2.23) was found in the variety Green Express which was statistically similar to Black Magic (2.18) and Bankim Purple Long (2.13) respectively. The variety Green Express provided the highest number of fruit plant^{-1} (15.00). The largest fruit size (185.7 cm^2) was also obtained from Green Express, which was statistically similar to Tal begun (178.70 cm^2). Consequently, the maximum fruit yield (47.09 t ha^{-1}) was achieved from the variety Green Express. The second highest fruit yield (38.79 t ha^{-1}) was recorded from Black Magic and the minimum fruit yield (12.08 t ha^{-1}) from Tal Begun.

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LIST OF ABBREVIATION AND ACRONYMS

AEZ	=	Agro-Ecological Zone
BARI	=	Bangladesh Agricultural Research Institute
BBS	=	Bangladesh Bureau of Statistics
FAO	=	Food and Agricultural Organization
N	=	Nitrogen
B	=	Boron
GA_3	=	Gibberellic acid
et al.	=	And others
TSP	=	Triple Super Phosphate
MOP	=	Muirate of Potash
RCBD	=	Randomized Complete Block Design
DAT	=	Days after Transplanting
ha^{-1}	=	Per hectare
g	=	gram (s)
kg	=	Kilogram
SAU	=	Sher-e-Bangla Agricultural University
SRDI	=	Soil Resources and Development Institute
wt.	=	Weight
LSD	=	Least Significant Difference
^0C	=	Degree Celsius
NS	=	Not significant
Max	=	Maximum
Min	=	Minimum

Chapter I

Introduction

CHAPTER I

INTRODUCTION

Brinjal (*Solanum melongena* L.) is one of the major vegetable crops under Solanaceae family. It is also known as Aubergine or Guinea squash or garden egg. It is one of the most common, popular and principle vegetable crops due to its diversified uses. It is cultivated as commercial vegetable throughout the tropical and sub tropical regions of the world. Brinjal is the second most important vegetable crop next to potato in Bangladesh in respect of acreage and production (BBS, 2012). Brinjal is a native crop of Indian sub-continent. A wide genetic diversity is found here due to the availability of different land races and their wild relatives.

The brinjal or eggplant is a crop of uncertain origin. The cultivated brinjal is undoubtedly of Indian origin and has been in cultivation for a long time (Thompson and Kelly, 1957). The domesticated types of brinjal were spread eastward from India to China by fifth Century B. C. So, the center of origin is the India sub-continent with a secondary center of origin in China and South-east Asia. According to Purewal (1957), it is still found growing wild in India. Different forms, colours, sizes and shapes of brinjal are found throughout the South-east Asia suggesting that this area is an important centre of diversity and possibly of origin. Now, the brinjal is of great importance in the warm areas of Far East, being grown more extensively in India, Bangladesh, Pakistan, China and Philippines. It is also grown in Nepal, Japan, France, Italy, USA, the Mediterranean and Balkan area (Bose and Som, 1986).

Brinjal is grown commonly in almost all parts of our country and liked by the people both poor and rich. It is a main vegetable to the poor people and is available more or

less throughout the year. Country to the common belief, it is quite high in nutritive value and can be compared with tomato (Choudhury, 1976). Brinjal is nutritious vegetable and has got multifarious use as a dish item (Bose and Som, 1986 and Rashid, 1993). It has higher calorie, iron, phosphorus and riboflavin contents than tomato (Shaha, 1989). Brinjal is high in water content and potassium.100 gram brinjal contains calcium 525 mg, potassium 618mg, carbohydrates 17.8 g, protein 8g, fat 27.5 g, Cholesterol 16mg, Dietary Fiber 4.9g, Iron 6mg, Vitamin A 6.4 mg, Sodium 62mg, Sugars 11.4g (Islam, 2005). It has been a staple vegetable in our diet since ancient times. It is quite high in nutritive value. It has potentiality as raw material in pickle making and in dehydration industries (Singh *et al*. 1963). Fried brinjal has some medicinal value to cure liver problem (Chauhan, 1981). Brinjal is a familiar vegetable crop for its easier cooking quality, better taste and lower market price. 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. About 8 million farm families are involved in brinjal cultivation (Islam, 2005). This gives small, marginal and landless farmers a continuous source of income, provides employment facilities for the rural people. In Bangladesh, brinjal crops cover 57,745 hectares with a production of 339,795 metric tons (BBS, 2012). Brinjal constitutes about 25.4% of the total vegetable area of the country. The main growing districts are: Bogra, Chittagong, Comilla, Dhaka, Dinajpur, Faridpur, Jamalpur, Jessore, Khagrachari, Khulna, Mymensingh, Rangamati, Rangpur,Rajshahi, Sylhet, and Tangail (BBS, 2012). Many insects, pests and diseases attack brinjal plants and fruits. Yield expression of a genotype is mainly governed by environment and other

management factors. The varieties of eggplant exhibit a great range of fruit shape and appearance from oval (egg shaped) to long club shaped. Colour of fruit also varied among the varieties such as white, yellow and green with different degrees of purple pigmentation to black. Tropical Chinese and Indian types have been established for commercially important varieties. The fruit production of brinjal per unit area is very less in Bangladesh as compared to western countries.

The yield of a genotype is the result of its total physiological activity; it is influenced by almost all its genes intervening directly (controlling the formation of different components of the production) or indirectly (through their action on the growth and development of the body under certain environmental conditions) (Kalloo et al. 1993, Kumar et al., 2008 and Mohammed, 2001), Therefore, this feature is extremely complex and controlled genetically but at the same time influenced by environmental conditions (Gajewski *et al*. 2009, Agnieszka *et al*., 2007)

The research work on morphological characteristics and causes of lower yield of available brinjal varieties are limited in Bangladesh. The present study was therefore, undertaken with the following objectives.

i. To study the morphological characteristics and yield attributes of the brinjal varieties.

ii. To identify the suitable brinjal varieties for commercial production.

Chapter II

Review of literature

CHAPTER II

REVIEW OF LITERATURE

The growth and yield of brinjal are influenced by morphological and yield contributing characteristics of brinjal varieties. The review of literature includes reports as studied by several investigators who found pertinent in understanding the problems which may help in the explanation and interpretation of results of the present investigation. In this chapter, an attempt has been made to review the available information in home and abroad on the studies on morphological characteristics and yield of brinjal varieties.

2.1 Growth and yield of brinjal

To assess the effect of different degrees of zinc to brinjal cultivars, an experiment was carried out at Horticulture Research Nursery, The University of Agriculture Peshawar during 2012. Single Factorial Randomized Complete Block Design (RCBD) was used in this experiment. Four levels of zinc (0, 0.1, 0.2, and 0.3%) were applied to three brinjal cultivars (Purple, Shimla, Shamli). Both cultivars and zinc levels proved significantly different among growth parameters. Plant height, number of leaves per plant, numbers of fruits per plant, fruit weight and total yield were significantly increased by zinc levels. Maximum plant height (131.89 cm), number of leaves per plant (437.78), number of fruits per plant (9.00), fruit weight (280.11 g) and total yield (15.33 t ha^{-1}) were recorded for plants treated with 0.2% zinc, while least number of leaves per plant (231.33), number of fruits per plant (5.33), fruit weight (143.89 g) and

total yield (4.51 t/ha) were recorded in control treatments. Plant height, number of leaves per plant, number of fruits per plant, fruit weight and total yield was significantly different among cultivars.

Maximum number of fruit per plant (7.42), fruit weight (210.583 g) and total yield (10.21 t/ha) were recorded for cultivar Purple. The growth and yield parameters indicates that cultivar Purple applied with 0.2% zinc showed best results and hence recommended for the brinjal growers in Peshawar valley (Tawab *et al*. 2015).

Msogoya *et al*. (2014) was laid out in a split plot arrangement in a complete randomized block design with three replications. Three African eggplant varieties (Tengeru white, AB2 and Manyire green) and three harvesting stages (1, 2 and 3) were used as main plot factor and sub plot factor, respectively. Harvesting stage 1 (immature fruits) was characterized by fruits with non-shiny peel, harvesting stage 2 (mature fruits) was characterized by fruits with shinny peel and harvesting stage 3 (over mature fruits) was characterized by fruits with yellow coloration at the bottom. Fruit yield was assessed based on number and weight of fruits per plant while fruit nutritional quality was assessed in the laboratory based on carbohydrate, fibres, alcium, potassium, magnesium, phosphorus, iron, 9-carotene and ascorbic acid contents. Results showed that yield in number of fruits per hectare decreased while yield in metric tons per hectare increased with fruit development stages. Varieties Tengeru white and AB2 had the highest yields based on metric tons at harvesting stage 2 while Manyire green had the highest yield at harvesting stage 3. Carbohydrate and fibre contents increased while ascorbic acid, 9-carotene and most minerals decreased with fruit development stages.

Moniruzzaman *et al.* (2014) conducted an experiment on brinjal *(Solanum melongena* L.) having seven growth regulators viz., control, 30 ppm GA3, 40 ppm GA3, 50 ppm GA3, 20 ppm NAA, 40 ppm NAA, and 60 ppm NAA and two varieties viz., BARI Begun-5 and BARI Begun -10 was conducted at the field of Plant Physiology Section of HRC during the *rabi* season (November 2011 to May 2013) to find out the suitable variety responsive to growth regulators and to determine the suitable dose of growth regulator for brinjal production. The GA3 (Gibberellic acid) and NAA (Naphthalene acetic acid) had no significant effect on plant height and stem diameter at the end of the crop period and days to 100% flowering.

NAA 40 ppm produced highest percentage of long and medium styled-flower, leaf photosynthesis and Fv/Fm (efficiency of photosystem II), number of fruits /plant and fruit yield (45.50 t/ha). The variety BARI Begun-5 was earlier to 100% flowering which took 44 days after transplanting which out yielded BARI Begun-10. NAA 40 ppm coupled with BARI Begun-5 gave the maximum Fv/Fm, long-styled flower percent, number of fruits/plant, and the highest fruit yield (49.73 t/ha). Eggplant is cultivated for its fruit consumed upon maturity; it is used in the preparation of different dishes such as salads, moussaka, potlatch, and stuffed eggplants. Productivity is, among others, the result of the effect of all the factors conditioning the expression of elementary morphological and physiological features of the studied biological material. The biological material used in the trials was represented by 10 cultivars (varieties and lines) of foreign origin, i.e.: Black Beauty, Black Enorma, Matrona, HSYE 40-00, HSYE 63-136, HSYE 73-45, HSYE 83-04, HSYE 83-111, HSYE 83-

121, and HSYE 83-132. To note the eggplant lines HSYE 83-04, HSYE 83-121, HSYE 63-136, and HSYE 40-00 due to their superior yielding potential oscillating between 30 and 36.5 t/ha, compared to the other trial genotypes in comparative culture (Poşta *et al.* 2012)

Sarker *et al.* (2011) conducted in Hajee Mohammad Danesh Science and Technology University campus to investigate the yield potential of some eggplant varieties using plant growth regulator. Seven varieties of eggplant viz., BARIBegun1, BARIBegun2, BARIBegun4, BARIBegun5, Bismillah, BARIBegun6, and Islampuri were used for test crop and Naphthalic acetic acid (NAA) 100 ppm was used as plant growth regulator. Eggplant variety BARIBegun5 showed the highest plant height (31.0 cm) at vegetative stages among the tested varieties. The mean Leaf number (32.0) was also higher in BARIBegun 5 in comparison to others. Leaf surface area which is important to photosynthic activities in eggplant was also significantly greater in BARIBegun2 *cv.* Tarapuri, compare to other varieties. Yield potent was significantly higher in BARIBegun5 followed by BARIBegun5. The lowest yield was performed by BARIBegun6. There is no significant effect of plant growth regulator NAA for growth and yield of eggplant. From this study it is inferred that eggplant cv. BARIBegun2 *cv.* Tarapuri might have best yield potential in the study area but it needs further extensive study using different plant growth regulators.

Paturde *et al.* (2012) conducted an experiment for the performance of Arka Mahima (Tetraploid) against Arka Sanjeevini (Diploid) varieties of wild brinjal under different plant spacing 60 × 30 or 30 × 30 cm^2 and two fertility levels (60:40:40 and 90:60:60

kg N, P_2O_5 and K_2O per ha . Arka Sanjeevini recorded significantly drier berry yield than Arka Mahima. However, solasodine content (%) and solasodine yield were significantly higher in Arka Mahima than Arka Sanjeevini.

An experiment was conducted at BARI, Joydebpur to determine the optimum time of planting. In the experiment Anonymous (1998) observed that planting time did not differ significantly in all the characters except TSS. The maximum yield was found when the crop was planted on 15 august. Anonymous (1998) reported that twenty four brinjal germplasms reported as tolerant to heat and moisture were further evaluated at Joydebpur for their growth and yield potential during summer time. Out of 24 gemplasms, only Singnath and Ired (India) showed the potentiality of withstanding heat and rainfall and produced fruits. Howerver, the yield was very low (17.0 t/ha). Due to variability studies in brinjal, eighteen lines were put under trial at Joydebpur during winter. Anonymous (1998) reported that the parameters under study showed significant variations among the lines. Days to first harvest ranged from 80-125 days from sowing, number of fruits per plant was 8-65, fruit length 10-30 cm and yield 25-70 ton per hectare. Twenty one selected brinjal lines were put under trial during winter season at Joydebpur to study variability of different characters. The characters under study showed significant variations among the lines. Days to first harvest ranged from 84-122, number of fruits per plant 9-61, fruit length 9-31cm and per hectare yield varied from 18-52 tons (Anon, 1997).

Badea *et al*. (1996) observed 1000 seed weight and weight and number of seeds per fruit, in relation to fruit size and characteristics in aubergine cultivars Lucia and Pana Corbului. They found that fruit weighting 180-1250 gm for Lucia and 300-860 gm for Pana corbului. The 1000 seed weight averaged 5.27 gm for Lucia and 4.30 gm per fruit for Pana cobului. Seed yield averaged 7.7 gm per fruit in Lucia and 11.26 gm per fruit in Pana Corbului. A significant positive correlation was found between fruit size, the number and weight of seeds per fruit and 1000 seed weight. Optimum fruit size was>700 gm for pana corbului, and >900gm for Lucia. To Evaluate 24 brinjal germplasms in summer season Anonymous (1995) reported that different character under study showed significant variations among the lines. Days to first harvest ranged from 107 to 121 days, number of fruit per plant ranged from 3 to 102, per plant yield ranged from 220 gm to 310 gm.

Working with 14 exotic and 2 local genotypes of brinjal grown during the winter season at Jorhat, Assam, Bora and Shadeque (1993) reported that fruit yield was significantly correlated with plant height and fruit diameter. The best performed genotypes were JC_2 for plant height (73.2 cm) and yield/plant (1.58 kg); KS 316 for primary branches/plant (7.22); KT4 and Punjab Barsati for fruits/plant (19.2); JCI for fruit length (24.96); H_8 for fruit diameter (8.22cm); and plant Rituraj for earliness (110 days). Generally there was a high level of genetic variations and heritability for all the characters.

An experiment was conducted at Jamalpur regional station of BARI to evaluate and selects the best winter type cultivars of brinjal. In their annual report Anonymous (1992) reported that the maximum average fruit weight was produced by Islampuri-3 (540g) and lowest by Jhumka (18g). Maximum number of fruit/plant was obtained in Jhumki-4 (158.3) and the lowest in Islampuri-3 (7.1). The highest yield per hectare was found in Uttara (50.2 t) and the lowest in Jhumki-2 (11.64 t). Singnath and Islampuri-3 gave and yield of 31.10 and 33.46 t/ha respectively. On the other hand Khothotia gave 18.77 t/ha yield.

Ahmed *et al*. (1988) conducted an experiment with 7 different varieties of brinjal and observed significant differences in height of plants, number of leaves per plant, length of tap root of the seedling, spread of the plants, number of primary branches per plant, period required for blossoming from the date of sowing, diameter of fruit, length of fruit, weight of individual fruit, number of total fruits produced per plant, total yield of fruits per plot. They further observed that plants of Islampuri were smaller, having minimum number of branches and leaves per plant. The plants of Singnath variety were the tallest of all varieties under study.

The plants of Khotkhotia were intermediate in all these respects. Signath produced maximum number of fruits per plant while the lowest number was recorded in Black beauty. But the number of fruits per plant had no significant correlation with total yield per plant. Regarding yield in terms of weight of fruit at edible stage the varieties were found to be widely different. The variety Tala was observed to be the best

yielder and considered to be superior among all the varieties which were followed by Singnath, Khotkhotia and the lowest yield was recorded against Black Beauty. Stigma receptivity, pollen fertility and pollen tube growth in vivo were assessed in 3 genotypes of aubergine.

Randhawa *et al.* (1988) observed that fruit set was 86.6% in BL4 (80.0% in BL3 and 50% in S16) when hand pollinated. All short-styled flowers of S16 dropped under open and hand pollination. Short-styled and pseudo short-styled flowers were male sterile. Pollen tubes in normal and mid styled plants were seen 4-12h after pollination whereas in pseudo-short styled plants pollen tubes bulged and broke. Heterostyli was noted in S16.

Nothmann *et al*. (1983) investigated the relations between floral morphology, flower position in the cluster and fruit set of 3 cultivars during the hot and cool growing seasons. They reported both style length and position in the cluster greatly affected the flowers fruit set potential. Flowers were accordingly grouped into different main types. Cultivar differences in flowering pattern and reaction to climatic conditions were described.

Chapter III

Materials and Methods

CHAPTER III

MATERIALS AND METHODS

In this chapter, the details of different materials used and methodologies followed during the experiment are described.

3.1. Experimental site

The research work was carried out at the Sher-e-Bangla Agricultural University horticultural farm, Dhaka, during the period from March to October, 2014. The experimental site was located in the center of Madhupur Tract having an elevation of 8.5 m above sea level.

3.2. Soil of the experimental field

Initial soil samples from 0-15 cm depth were collected from experimental field. The collected samples were analyzed at Soil Resources Development Institute (SRDI), Dhaka, Bangladesh. The physio-chemical properties of the soil are presented in Appendix I. The soil of the experimental plots belonged to the agro ecological zone of Madhupur Tract (AEZ-28).

3.3. Climate of the experimental area

The experimental area was under the subtropical climate. Usually the rainfall was heavy during *Kharif* season and scanty in *Rabi* season. The weather conditions during experimentation such as monthly mean rainfall (mm), mean temperature (^{0}C), sunshine hours and humidity (%) are presented in Appendix II.

3.4. Planting material

In this research work, the seeds of four brinjal varieties were used as planting materials. The brinjal varieties used in the experiments were Green Round, Bankim Purple Long, Debjhuri Hajari, Black Magic, Muktojhuri, Green Express, Black Boy and Tal Begun. All varieties are semi-indeterminate type and the seeds were collected from the Horticulture Research Centre, Bangladesh Agricultural Research Institute (BARI) at Joydebpur.

3.5. Germination test

Germination test was performed before seed sowing in the field. Three layers of filter papers were placed on Petri dishes. Each Petridis contained 100 seeds. Germination percentage was calculated by using the following formula.

$$\text{Germination (\%)} = \frac{\text{Number of seeds germinated}}{\text{Total number of seeds}} \times 100$$

3.6 Raising of seedlings

Brinjal seedlings were raised in two seedbeds situated on a relatively high land adjacent to the Farm Office. The size of each seedbed was 3 m × 1 m. the soil was well prepared and converted into loose, friable and dried mass by spading. All weeds and stubbles were removed and the soil was mixed with 5 kg well rotten cow-dung. The seeds were sown on the seedbed on 11 March, 2014. After sowing the seeds were covered with light soil. Complete germination of the seed took place within 10 days after sowing seeds in the beds. Necessary shading by bamboo mat (*chatai*) was provided over the seedbed to protect the young seedlings from scorching sunshine and

heavy rain. Weeding, mulching and irrigation were done from time to time as and when needed.

3.7 Treatments of the experiment

The treatments were tested as follows**:**

Factor A: 8 varieties

V_1 = Green Round

V_2 = Bankim Purple Long

V_3 = Debjhuri Hajari

V_4 = Black Magic

V_5 = Muktojhuri

V_6 = Green Express

V_7 = Black Boy

V_8 = Tal Begun

3.8 Experimental design and layout

The experiment was laid out in a Randomized Complete Block Design (RCBD). Each treatment was replicated for three times. The size of each plot was 2.4 m × 3.0 m. The distance between two adjacent replications (block) was 1.0 meter and plot to plot distance was 0.5 meter. The intra block and plot spaces were used as irrigation and drainage channels.

3.9 Cultivation procedure

3.9.1 Land preparation

The land was irrigated before ploughing. After having “zoe” condition the land was first opened with the tractor drawn disc plough. Ploughed soil was then brought into desirable tilth by six operations of ploughing, harrowing and laddering. The stubble and weeds were removed. The first ploughing and the final land preparation were done on 25 March and 30 March 2014, respectively. Experimental land was divided into unit plots following the design of experiment. The plots were spaded one day before planting and the basal dose of fertilizers were incorporated thoroughly.

3.9.2 Manuring and Fertilization

The entire quantity of cow-dung (5 t ha^{-1}) was applied just after opening the land. Urea, Triple Super Phosphate (TSP) and Muriate of Potash (MP) were used as a source of nitrogen (N), phosphorous and potassium respectively. TSP was applied in the experiment as per treatment. Urea and MP were applied at the rate of 370 kg and 250 kg ha^{-1} respectively following the BARI recommendation (Rashid, 1993).

3.9.3 Transplantation and after care

Healthy and uniform sized seedlings of 45 days were taken separately from the seedbed and were transplanted in the experimental plots in the afternoon of 16th April 2014 maintaining difference as per treatment between the rows and plants. The seed bed was watered before uprooting the seedlings from the seedbed to minimize damage of the roots. The seedlings were watered after transplanting and continued for several

days for their early establishment. Seedlings were also transplanted around the border of the experimental plots for gap filling.

3.9.4 Intercultural operations

After transplanting the seedlings, different intercultural operations were accomplished for better growth and development of the plants.

3.9.4.1 Gap filling

When the seedlings were established, the soil around the base of each seedling was pulverized. A few gaps filling were done by healthy seedlings of the same stock previously planted in boarded area on the same date of transplanting.

3.9.4.2 Weeding

Weeding was done at every 15 days interval after planting and followed upto peak flowering stage. As the land was covered by plant canopy by that time weeding was discontinued.

3.9.4.3 Irrigation

Two irrigations were given throughout the growing period. The first irrigation was given 40 days after planting followed by another irrigation 20 days after the first irrigation.

3.9.4.4 Plant Protection

Insect-pests: As preventive measure against the insect pests like cut worms, shoot and fruit borer, leafhopper etc. Malathion 57 EC was applied at the rate of 2 ml/L. The insecticide applications were done weekly as a routine work from a week after transplanting to early growth stage of fruit and then applications were done every

three days after up to nature stage of the fruit. Miral 3 GN was also applied during final land preparation as soil insecticide.

Disease: Precautionary measures against disease infection especially Phomopsis fruit rot of brinjal, was taken by spraying Bavistin fortnightly @ 2 g/L.

3.10 Harvesting

Fruits were harvested when they attained full maturity indicating deep violet in color and hard in consistency. Harvesting was done from 23 August, 2014.

3.11 Data collection

The following data were recorded

3.11.1 Plant height

The heights of pre-selected ten plants were measured with a meter scale from the ground level to the top of the plants and the mean height was expressed in cm.

3.11.2 Leaves plant^{-1}

The leaves were counted from ten plants at the time of harvesting. The average number of leaves plant^{-1} was determined.

3.11.3 Branches plant^{-1}

The branches were counted from ten plants at the time of harvesting. The average number of branches plant^{-1} was determined.

3.11.4 Individual leaf area

Twenty leaflets were collected randomly from the field and the length and breadth of each leaflet were measured. Length and breadth were multiplied to get the area of individual leaflets. All the area were summed up and divided b

20 to get the average leaflet are. Real leaf area was then determined by using the following formula:

Real leaf area= length × breadth

3.11.5 Days to first flowering: Days to first flowering were recorded from transplanting date to the date of first flowering of every entry.

3.11.6 Days to first fruiting: Days to first fruiting were recorded from transplanting date to the date of first fruiting of every entry.

3.11.7 Days to first harvest: The data were recorded from the date of transplanting to fruit maturity of plants of each entry.

3.11.8 Flowers number cluster^{-1}

Total number of flowers was counted from selected flowers cluster of sample plant and was calculated by the following formula:

$$\text{Number of flowers cluster}^{-1} = \frac{\textbf{Total number of flowers from ten sample plants}}{\textbf{Total number of flowers clusters from ten sample plants}}$$

3.11.9 Flowers plant^{-1}

At the peak of flowering time this was counted from sample plants and then the average number of flowers produced plant^{-1} was recorded.

3.11.10 Fruits cluster^{-1}

Total number of fruits was counted from selected cluster of sample plant and was calculated by the following formula:

$$\text{Number of fruits cluster}^{-1} = \frac{\text{Total number of fruits from ten sample plants}}{\text{Total number of fruits clusters from ten sample plants}}$$

3.11.11 Fruits plant^{-1}

It was recorded by the following formula

$$\text{Number of fruits plant}^{-1} = \frac{\text{Total number of fruits from ten samples}}{10}$$

3.11.12 Fruit length

The length of fruit was measured with a slide calipers from the neck of the fruit to the bottom of 10 selected marketable fruits from each plot and their average was taken in cm as the length fruit

3.11.13 Fruit diameter

Diameter of fruit was measured at the middle portion of 10 selected marketable fruit from each plot with a slide calipers and there average was taken in cm.

3.11.14 Individual fruit weight

Among the total number of fruits harvests during the period from first to final harvest, the fruits, except the first and last harvests, were considered for determining the individual fruit weight in gram.

3.11.15 Fruits weight plant^{-1}

It was measured by the following formula

$$\text{Weight of fruits plant}^{-1}\text{ (kg)} = \frac{\text{Total wt. of fruits from ten sample plants}}{10}$$

3.11.16 Fruits yield plot^{-1}

A per scale balance was used to take the weight of fruits per plot. It was measured by totaling the fruit yield of each unit plot separately during the period from fruit to final harvest and was recorded in kilogram (kg).

3.11.17 Fruits yield hectare^{-1}

It was measured by the following formula

$$\text{Fruit yield hectare}^{-1}\text{ (ton)} = \frac{\text{Fruit yield per plot (kg) x 10}}{\text{Area of plot in square meter}}$$

3.11.17 Estimation of leaf chlorophyll

Leaf Chlorophyll content was determined on fresh weight basis extracting with 80% acetone and used double beam spectrophotometer according to Witham *et al.* (1986)

3.12 Statistical analysis

The data collected on different parameters were statistically analyzed to obtain the level of significance using the MSTAT-computer package program developed by Gomez and Gomez. (1984). the means were separated following Duncan's Multiple Range Test (DMRT) at 5% levels of significance.

Chapter IV

Results and Discussion

CHAPTER IV

RESULTS AND DISCUSSION

This chapter comprises the presentation and discussion of the results from the experiment. The experiment was conducted to study on morphological characteristics and yield of some brinjal varieties. Some of the data have been presented and expressed in table (s) and others in figures for ease of discussion, comparison and understanding. All the parameters studied have been shown in possible interpretation wherever necessary have given under the following headings.

4.1 Plant height

Plant height is one of the important parameter, which is positively correlated with the yield of brinjal. Plant height was recorded at 20, 30, 40 and 50 days after transplanting (DAT). Plant height at 20, 30, 40 and 50 DAT due to the influence of different varieties was significant. At 20 DAT, The variety Green Express (V_6) had the highest plant height (14.00 cm) which was statistically similar with V_2, V_8, and V9. However, the lowest plant height (9.00 cm) was obtained from the variety Debjhuri Hajari (V_3) (Fig. 1). At 30 DAT, The variety Green Express (V_6) had the highest plant height (22.33cm) which was statistically different from other varieties. However, the lowest plant height (14.00 cm) was obtained from the variety Debjhuri Hajari (V_3). The highest plant height (38.00 cm) obtained from variety Green Express (V_6). On the other hand, the lowest plant height (27.33 cm) was obtained from the variety Debjhuri

Hajari (V_3) at 40 DAT. The highest plant height (60.67 cm) obtained from variety Green Express (V_5). On the other hand, the lowest plant height (44.00 cm) was obtained from the variety Debjhuri Hajari (V_3) at 50 DAT. Varietal influence on plant height was also reported by Hossain *et al*. (1986).

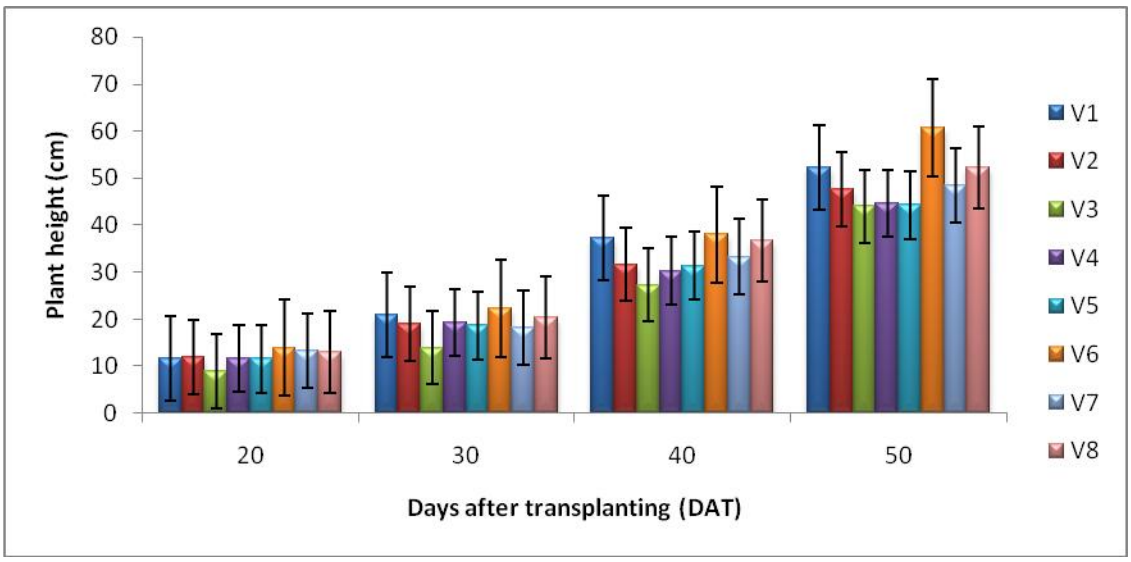

Fig. 1. Variation in plant height among different brinjal varieties at different days after transplanting (Vertical bar represents SE)

V_1 = Green Round, V_2 = Bankim Purple Long, V3 = Debjhuri Hajari, V_4 = Black Magic, V5 = Muktojhuri, V_6 = Green Express, V7 = Black Boy, V_8 = Tal Begun

4.2 Leaves number plant^{-1}

A good number of leaves indicated better growth and development of crop. It is also possibly related to the yield of brinjal. The greater number of leaf, the greater the photosynthetic area which may result higher fruit yield. Number of leaves plant^{-1} due to the influence of different varieties was significant at at 20, 30, 40 and 50 DAT. At 20 DAT, The variety Green Express (V_6) had the highest number of leaves plant^{-1} (13.33 cm). However, the lowest plant height (6.33 cm) was obtained from the variety Debjhuri Hajari (V_3) (Fig. 2). At 30 DAT, The variety Green Express (V_6) had the highest number of leaves plant^{-1}

(22.00) which was statistically similar to V_8. However, the lowest number of leaves plant^{-1} (12.00 cm) was obtained from the variety Debjhuri Hajari (V_3). The highest number of leaves per plant (37.33) obtained from variety Green Express (V_6). On the other hand, the lowest number of leaves plant^{-1} (21.00) was obtained from the variety Debjhuri Hajari (V_3) at 40 DAT. The highest number of leaves plant^{-1} (77.00) obtained from variety Green Express (V_6), which was statistically similar with V_2 and V_8. On the other hand, the lowest number of leaves per plant (43.00) was obtained from the variety Debjhuri Hajari (V_3) at 50 DAT. Similar results had been reported by Ahmed *et al.* (1988). They conducted an experiment with seven different varieties of brinjal and observed a significant variation in the number of leaves per plant.

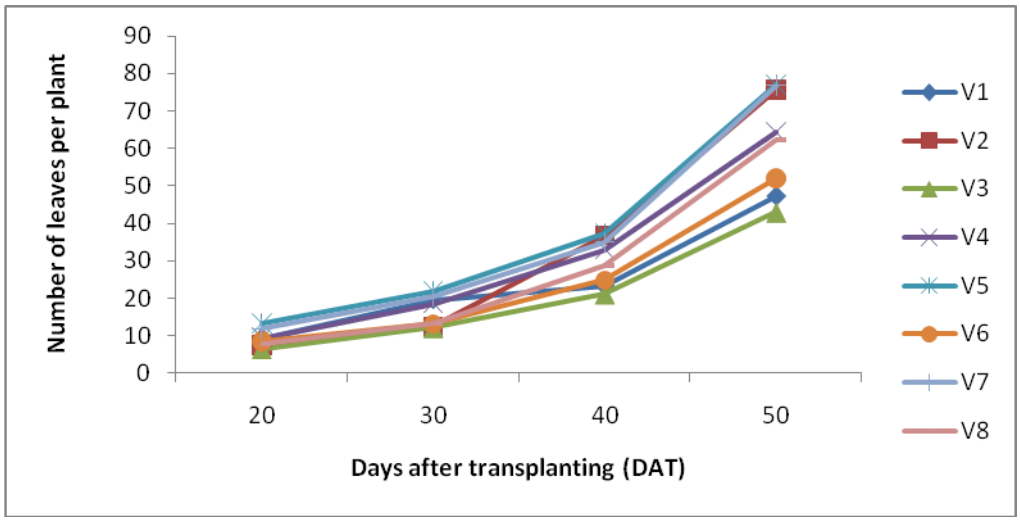

Fig. 2. Number of leaves per plant at days after transplanting in brinjal varieties

V_1 = Green Round, V_2 = Bankim Purple Long, V3 = Debjhuri Hajari, V_4 = Black Magic, V5 = Muktojhuri, V_6 = Green Express, V7 = Black Boy, V_8 = Tal Begun

4.3 Chlorophyll content

The leaf chlorophyll content was significantly influenced by variety. Treatment V_6 produced maximum chlorophyll content (6.57 mg g^{-1}) followed by V_4 and the minimum (5.13 mg g^{-1}) chlorophyll content was recorded in V_3 treatment (Fig. 3).

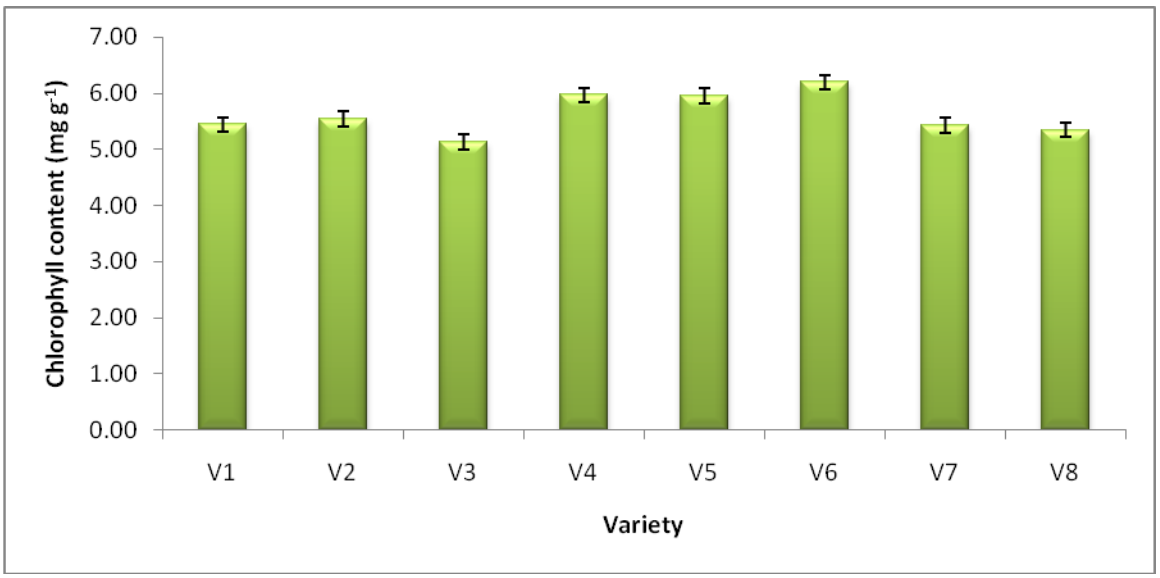

Fig. 3. Variation in leaf chlorophyll content among different brinjal varieties (Vertical bar represents SE)

V_1 = Green Round, V_2 = Bankim Purple Long, V3 = Debjhuri Hajari, V_4 = Black Magic, V5 = Muktojhuri, V_6 = Green Express, V7 = Black Boy, V_8 = Tal Begun

4.4 Branches number plant^{-1}

Number of branches plant^{-1} due to the influence of different varieties was significant. The variety Green Express (V_6) had the highest number of branches per plant (8.33) and the lowest number of branches plant^{-1} (4.67) was obtained from the variety Debjhuri Hajari (Table 1).

4.5 Individual leaf area

The leaf area was significantly influenced by variety. Treatment V_6 produced maximum leaf area (200.00 cm^2) followed by V_7 and the minimum (4.00 cm^2) leaf area was recorded in V_3 treatment (Table 1).

Table 1. Effect of variety on the number of branches plant^{-1} and individual leaf area of brinjal

Treatments	Number of branch plant^{-1}	Leaf area (cm^2)
V_1	6.33 abc	175.30 c
V_2	7.33 ab	122.70 e
V_3	4.67 c	82.33 g
V_4	6.00 bc	112.70 f
V_5	5.33 bc	84.33 g
V_6	8.33 a	200.00 a
V_7	6.33 abc	185.00 b
V_8	6.67 abc	141.70 d
LSD (0.05)	2.09	4.60
CV (%)	8.71	9.64

Values with common letter(s) within a column do not differ significantly at 5% level of probability as per DMRT.

V_1 = Green Round, V_2 = Bankim Purple Long, V3 = Debjhuri Hajari, V_4 = Black Magic, V5 = Muktojhuri, V_6 = Green Express, V7 = Black Boy, V_8 = Tal Begun

4.6 Days to first flowering

There was a marked difference among the varieties in the days to first flowering. Delayed flowering (39.37 days) was found in Tal Begun (V_8) and flowering was earliest (25.67 days) in V_6 treatment (Table 2). This difference in flower initiation was due to its varietal characters. Sing and Sahu (1998) also reported varietal influence on days to flowering. The variations in days to first flowering in different brinjal varieties were possibly due to their varietal traits. This result is in conformity with Sarkar and Haque (1980). They observed that the period of flowering varied from variety to variety. Vijay *et al.* (1977) also reported similar result.

4.7 Days to first fruiting

There was a marked difference among the varieties in the days to fruiting. Delayed fruiting (57.33 days) was found in Tal Begun (V_8) and flowering was earliest (33.67 days) in V_6 treatment (Table 2). This difference in flower initiation was due to its varietal characters.

4.8 Days to first harvesting

There was a marked difference among the varieties in the days to first harvesting. The first harvesting was earliest (51.0 days) in V_6 and V_2 treatment and Delayed first harvesting (79.0 days) was found in V_8 treatment (Table 2). Varietal influence on the days to first harvesting was also reported by Hossain (2001) and Kalloo (1989).

Table 2. Effect of variety on the days to first flowering, days to first fruiting and days to first harvesting in brinjal

Treatments	Days to first flowering (DAT)	Days to first fruiting (DAT)	Days to first harvesting (DAT)
V_1	25.67 c	37.00 c	56.00 d
V_2	35.33 b	50.00 b	51.00 d
V_3	36.00 ab	55.33 ab	68.67 b
V_4	27.00 c	34.33 c	58.00 cd
V_5	36.67 ab	50.00 b	67.00 bc
V_6	25.67 c	33.67 c	51.00 d
V_7	26.67 c	34.00 c	70.33 ab
V_8	39.67 a	57.33 a	79.00 a
LSD (0.05)	3.68	6.89	9.77
CV (%)	6.65	8.95	8.91

Values with common letter(s) within a column do not differt significantly at 5% level of probability as per DMRT.

V_1 = Green Round, V_2 = Bankim Purple Long, V3 = Debjhuri Hajari, V_4 = Black Magic, V5 = Muktojhuri, V_6 = Green Express, V7 = Black Boy, V_8 = Tal Begun

4.9 Flowers cluster^{-1}

There was a significant difference among the varieties in the number of flowers cluster^{-1}. As evident from Table 3a, the maximum number of flowers cluster^{-1} (6.0) was produced in V_6. The minimum number of flowers cluster^{-1} (3.33) was produced in V_3.

4.10 Flowers plant^{-1}

There was a significant difference among the varieties in the number of flowers per plant. As evident from Table 3a, the maximum number of flowers plant^{-1} (41.00) was produced in V_6. The minimum number of flowers plant^{-1} (18.00) was produced in Tal begun (V_8).

4.11 Fruits cluster^{-1}

Number of fruit cluster^{-1} due to the influence of different varieties was significant. The variety Green Express had the highest number of fruits cluster^{-1} (2.23) which was statistically similar with Bankim Purple Long (V_2) and Black Boy (V_7). However, the lowest number of fruits cluster^{-1} (1.00) was obtained from the variety Debjhuri Hajari. Hossain (2001) reported that BARI Tomato-3, BARI Tomato-2 and BARI Tomato-9 were statistically similar in respect of number of fruits cluster^{-1} (Table 3a). This result partially agreed with the findings of our experiment.

4.12 Fruits plant^{-1}

Number of fruit plant^{-1} due to the influence of different varieties was significant. The variety Green Express (V_6) had the highest number of fruit plant^{-1} (15.00) and the lowest number of fruit plant^{-1} (6.33) was obtained from the variety Tal Begun (V_8) (Table 3a). This variation among varieties was due to the genetically potentiality of the varieties and is supported by Hossain *et al.* (1986).

Table 3a. Effect of variety on the yield contributing characters of brinjal

Treatments	Flowers cluster^{-1}		Flowers plant^{-1}		Fruits cluster^{-1}		Fruits plant^{1}	
V_1	5.00	bc	22.67	cd	1.67	ab	8.00	de
V_2	5.67	ab	26.67	bc	2.13	a	9.67	cd
V_3	3.33	e	23.33	cd	1.00	c	11.67	bc
V_4	4.00	de	28.33	b	1.33	bc	12.67	b
V_5	5.00	bc	21.33	de	1.67	ab	10.33	bcd
V_6	6.00	a	41.00	a	2.23	a	15.00	a
V_7	4.67	cd	26.67	bc	2.00	a	10.00	cd
V_8	4.67	cd	18.00	e	1.67	ab	6.33	e
LSD (0.05)	0.68		4.37		0.49		2.34	
CV (%)	4.00		5.15		5.59		9.32	

Values with common letter(s) within a column do not differ significantly at 5% level of probability as per DMRT.

V_1 = Green Round, V_2 = Bankim Purple Long, V3 = Debjhuri Hajari, V_4 = Black Magic, V5 = Muktojhuri, V_6 = Green Express, V7 = Black Boy, V_8 = Tal Begun

4.13 Fruit length

A significant variation in the length of fruit was found among the varieties. The longest fruit length (1867. cm) was obtained from V_6 treatment and the shortest fruit length (9.00 cm) was obtained from V_3 treatment (Table 3b). Hossain (2001), Singh and Sahu (1998) also reported varietal influence on the length of fruit.

4.14 Fruit Breadth

A significant variation in the breadth of fruit was found among the varieties. The largest fruit breadth (6.16 cm) was obtained from V_6 treatment, which is statistically similar to V_1 treatment and the shortest fruit breadth (6.67 cm) was obtained from V_3 treatment (Table 3b). Hossain (2001), Singh and Sahu (1998) also reported varietal influence on the breadth of fruit.

4.15 Individual fruit weight

The weight of individual fruit weight was significantly influenced by different varieties (Table 3b). The largest individual fruit weight (114.00 g) was obtained from Green Express (V_6). The shortest fruit weight (18.39 g) was obtained from Muktojhuri (V_5). The wide variation among the varieties in respect of individual fruit weight was due to the varietal characteristics. Varietal influence on individual fruit weight was also reported by Hossain *et al*. (1986) and Meher *et al.* (1994).

Table 3 b. Effect of variety on the yield components of brinjal

Treatmens	Fruit length (cm)	Fruit breadth (cm)	Individual fruit weight (g)
V_1	11.67 c	16.00 a	102.00 a
V_2	14.67 b	8.00 cd	71.42 bc
V_3	9.00 d	6.67 d	55.15 d
V_4	10.67 cd	7.33 cd	84.18 b
V_5	11.00 cd	9.67 b	48.39 d
V_6	18.67 a	16.00 a	114.4 a
V_7	15.00 b	8.33 bc	59.73 cd
V_8	12.33 c	8.00 cd	72.36 bc
LSD (0.05)	2.02	1.40	12.64
CV (%)	8.95	7.98	9.5

Values with common letter(s) within a column do not differ significantly at 5% level of probability as per DMRT.

V_1 = Green Round, V_2 = Bankim Purple Long, V_3 = Debjhuri Hajari, V_4 = Black Magic, V_5 = Muktojhuri, V_6 = Green Express, V_7 = Black Boy, V_8 = Tal Begun

4.16 Fruit yield plant $^{-1}$

The different varieties of brinjal significantly influenced on the yield of fruits plant^{-1}. The maximum yield of fruits plant^{-1} (4.84 kg) was obtained from Green Express (V_6) and the minimum yield of fruits plant^{-1} (1.24 kg) was obtained from Tal Beguni (Table 4). Hossain (2001) and Ahmed *et al*. (1986) also reported varietal influence on the yield of fruit hectare^{-1}.

4.17 Fruit yield plot^{-1}

The different varieties of brinjal significantly influenced on the yield of fruits plot^{-1}. The maximum yield of fruits per plot (33.90 kg) was obtained from

Green Express (V_6) and the minimum yield of fruits pot^{-1} (8.7 kg) was obtained from Tal Beguni (V_8) (Table 4). Hossain (2001) and Ahmed *et al*. (1986) also reported varietal influence on the yield of fruit hectare^{-1}.

4.18 Fruit yield hectare^{-1}

Yield of fruits per hectare was varied significantly by the different varieties of brinjal. The maximum yield of fruits per hectare (47.09 t) was obtained from Green Express (V_6) and the minimum yield of fruit hectare^{-1} (12.80 t) was obtained from Tal Beguni (V_8) (Table 4). Hossain (2001) and Ahmed *et al*. (1986) also reported varietal influence on the yield of fruit per hectare.

Table 4. Effect of variety on the yield of brinjal

Treatments	Fruit wt. plant^{-1} (kg)	Yield plot^{-1} (kg)		Yield hectare^{-1} (ton)	
V_1	2.44	c	17.06	c	23.69	c
V_2	2.45	c	17.18	c	23.86	c
V_3	1.89	e	13.26	d	18.41	c
V_4	3.99	b	27.93	b	38.79	b
V_5	2.18	d	15.26	cd	21.19	c
V_6	8.07	a	33.90	a	47.09	a
V_7	2.22	d	15.53	cd	21.57	c
V_8	1.24	f	8.70	e	12.08	d
LSD (0.05)	0.28		3.096		4.99	
CV (%)	7.69		5.68		673	

Values with common letter(s) within a column do not differ significantly at 5% level of probability as per DMRT.

V_1 = Green Round, V_2 = Bankim Purple Long, V3 = Debjhuri Hajari, V_4 = Black Magic, V5 = Muktojhuri, V_6 = Green Express, V7 = Black Boy, V_8 = Tal Begun

Chapter V

Summary and Conclusion

Chapter V

SUMMARY AND CONCLUSION

The research work was carried out at the Research Farm of Sher-e-Bangla Agricultural University, Dhaka, during March to October, 2014. The experiment included eight varieties, *viz.* Green Round, Bankim Purple Long, Debjhuri Hajari, Black Magic, Muktojhuri, Green Express, Black Boy and Tal Begun. The factorial experiment was laid out in Randomized complete Block Design (RCBD) having one factor with three replications.

Data were taken on growth; yield contributing characters, yield and the collected data were statistically analyzed for evaluation of the treatment effects. The summary of the results has been described in this chapter.

The main effect of variety demonstrated that, the variety Green Express produced the tallest plant (14.00, 22.33, 38.00 and 60.67 cm at 20, 30, 40 and 50 DAT, respectively). Significant variation in number of leaves was observed due to variety. The maximum values of the parameters were produces from the variety Green Express (13.33, 22.00, 37.33, and 77.00 at 20, 30, 40 and 50 DAT, respectively). Number of branches plant^{-1} due to the influence of different varieties was significant. The variety Green Express (V_6) had the highest number of branches plant^{-1} (8.33). The leaf area index was significantly influenced by variety. Treatment V_6 produced maximum leaf area index (200.00) followed by V_7. Significant variation in Day of first flowering, Day of first fruiting and Day of first harvesting was observed due to variety. The flowering was earliest (25.67 days) in V_6 (Green Express) treatment. The flowering was earliest (33.67 days) in V_6 (Green Express) treatment. The first harvesting was

earliest (51.00 days) in V_6. There was a significant difference among the varieties in the number of flowers cluster^{-1}. The maximum number of flowers cluster^{-1} (6.00) was produced in V_6. There was a significant difference among the varieties in the number of flowers plant^{-1}. The maximum number of flowers plant^{-1} (41.00) was produced in V_6. Number of fruits cluster^{-1} due to the influence of different varieties was significant. The variety Green Express had the highest number of fruits cluster^{-1} (2.23). Number of fruit plant^{-1} due to the influence of different varieties was significant. The variety Green Express (V_6) had the highest number of fruit plant^{-1} (15.00). A significant variation in the length of fruit was found among the varieties. The longest fruit length (1867. cm) was obtained from V_6 treatment. A significant variation in the breadth of fruit was found among the varieties. The largest fruit breadth (6.16 cm) was obtained from V_6 treatment. The weight of individual fruit weight was significantly influenced by different varieties (table 3). The largest individual fruit weight (114.00 g) was obtained from Green Express (V_6). The shortest fruit weight (18.39 g) was obtained from Muktojhuri (V_5). The different varieties of brinjal significantly influenced on the yield of fruits plant^{-1}. The maximum yield of fruits plant^{-1} (4.84 kg) was obtained from Green Express (V_6) and the minimum yield of fruits plant^{-1} (1.24 kg) was obtained from Tal Begun.

Variety exhibited marked influence brinjal fruit yield. The different varieties exhibited marked influence on fruit yield of brinjal. The highest fruit yield plant^{-1} (4.84 kg) was found in Green Express. The different varieties of brinjal significantly influenced on the yield of fruits plot^{-1}. The maximum yield of fruits plot^{-1} (33.90 kg) was obtained from Green Express Yield of fruits ha^{-1} was varied significantly by the different

varieties of brinjal. The maximum yield of fruits ha^{-1} (47.09 t) was obtained from Green Express (V_6) and the minimum yield of fruits per hectare (12.80 t) was obtained from Tal Begun.

Consider the stated findings, it may be concluded that –

- The variety Green Express was the best among the studied brinjal varieties.
- However, it needs more trials under farmer's field conditions at different agro-ecological zones of Bangladesh for the conformation of the results.

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Appendices

APPENDICES

Appendix I: Soil characteristics of Horticulture Farm of Sher-e-Bangla Agricultural University are analyzed by Soil Resources Development Institute (SRDI), Farmgate, Dhaka.

A. Morphological characteristics of the experimental field

Morphological features	**Characteristics**
Location	Farm, SAU, Dhaka
AEZ	Modhupur tract (28)
General soil type	Shallow red brown terrace soil
Land type	High land
Soil series	Tejgaon
Topography	Fairly leveled
Flood level	Above flood level
Drainage	Well drained

Source: Dept. of Soil Science, SAU, Dhaka.

B. Physical and chemical properties of the initial soil

Characteristics	**Value**
Practical size analysis	
Sand (%)	16
Silt (%)	56
Clay (%)	28
Silt + Clay (%)	84
Textural class	Silty clay loam
pH	5.56
Organic matter (%)	0.25
Total N (%)	0.02
Available P (µgm/gm soil)	53.64
Available K (me/100g soil)	0.13
Available S (µgm/gm soil)	9.40
Available B (µgm/gm soil)	0.13
Available Zn (µgm/gm soil)	0.94
Available Cu (µgm/gm soil)	1.93
Available Fe (µgm/gm soil)	240.9
Available Mn (µgm/gm soil)	50.6

Source: Dept. of Soil Science, SAU, Dhaka.

Appendix II. Monthly average temperature, relative humidity and total rainfall of the experimental site during the period from March to October 2014

Month	Air temperature (^{0}C)			RH (%)	Total rainfall (mm)
	Maximum	Minimum	Mean		
March	31.25	21.55	26.40	74.65	35
April	32.98	23.72	28.35	88.24	65
May	34.00	24.65	34.33	79.55	155
June	33.85	26.15	30.0	69.05	184
July	34.20	24.50	29.35	89.5	281
August	33.30	24.6	28.95	88.5	210
September	32.7	26.0	29.3	183	81
October	30.5	24.3	27.4	417	80

Source: Metrological Centre, Agargaon, Dhaka

Appendix III: Analysis of variance of the data on plant height of brinjal as influenced by different varieties

Sources of Variation	Degrees of freedom	Mean Square			
		Plant height			
		20 DAT	30 DAT	40 DAT	50 DAT
Replication	2	1.542	6.5	42	50.167
Factor A	7	6.899*	18.185*	43.119*	96.613*
Error	14	2.113	7.024	15.619	38.167

*significant at 5% level of probability

Appendix IV: Analysis of variance of the data on number of leaves per plant of brinjal as influenced by different varieties

Sources of Variation	Degrees of freedom	Mean Square			
		Number of leaves per plant			
		20 DAT	30 DAT	40 DAT	50 DAT
Replication	2	14.542	58.042	34.042	48.667
Factor A	7	17.042*	52.375*	123.38*	560.52*
Error	14	3.113	13.232	19.804	138.29

*significant at 5% level of probability

Appendix V: Analysis of variance of the data on chlorophyll percentage, number of branches per plant and leaf area of brinjal as influenced by different variety

Sources of Variation	Degrees of freedom	Mean Square		
		Chlorophyll percentage	Number of branches per plant	Individual leaf area
Replication	2	53.395	11.375	88.625
Factor A	7	40.628*	3.851*	6135.4*
Error	14	40.629	1.423	176.91

*significant at 5% level of probability

Appendix VI: Analysis of variance of the data on Days to first flowering, first fruiting and first harvesting of brinjal as influenced by different varieties

Sources of Variation	Degrees of freedom	Mean Square		
		Days to first flowering	Days to first fruiting	Days to first harvesting
Replication	2	6.167	9.042	3.875
Factor A	7	102.83*	311.76*	308.04*
Error	14	4.405	15.47	31.113

*significant at 5% level of probability

Appendix VII: Analysis of variance of the data on yield contributing character of brinjal as influenced by different varieties

Sources of Variation	Degrees of freedom	Mean Square			
		Number of flowers per cluster	Number of flowers per plant	Number of fruits per cluster	Number of fruits per plant
Replication	2	0.292	39.5	0.292	1.167
Factor A	7	2.185*	143.71*	0.381*	98.232*
Error	14	4.149	36.214	0.577	11.786

*significant at 5% level of probability

Appendix VIII: Analysis of variance of the data on length of fruit and fruit breadth of brinjal as influenced by different varieties

Sources of Variation	Degrees of freedom	Mean Square	
		Length of fruit	Breadth of fruit
Replication	2	0.375	0.875
Factor A	7	28.47*	43.333*
Error	14	1.327	0.637

*significant at 5% level of probability

Appendix IX: Analysis of variance of the data on yield and yield of brinjal as influenced by different varieties

Sources of Variation	Degrees of freedom	Mean Square			
		Individual fruit weight	Fruit weight plant^{-1}	yield per plot	Yield hectare^{-1}
Replication	2	70.984	43.825	78.125	78.125
Factor A	7	1589.6*	10885*	390.95*	202.56*
Error	14	52.095	4734.3	28.125	28.125

*significant at 5% level of probability