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VARIETAL EFFECT ON THE YIELD AND YIELD COMPONENTS OF LENTIL (*Lens culinaris* L.)

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Abstract

The experiment was carried out to study the effect of variety on the yield and yield components of lentil at the Bangabandhu Academy for poverty Alleviation and Rural Development (BAPARD), Agricultural farm field, Kotalipara, Gopalgonj during November 2018 to March, 2019. Three lentil varieties, *viz*., BARI Masur-6, BARI Masur-7 and BARI Masur-9 were used in this experiment. Varieties showed significant influence on the all parameters except plant height and number of seed per pod. The highest seed yield (2224.81 kg/ha.) was found in BARI Masur-6 and the lowest seed yield (1356.94 kg/ha.) was observed in BARI Masur-9. It was evident from the present study among the varieties BARI Masur-6 was superior than BARI Masur-7 and BARI Masur-9 for produced the highest seed yield.

Keywords: Lentil, Yield, Variety, Seed.

Introduction

Lentil (*Lens culinaris* L.) is one of the most important pulse crops grown in Bangladesh. It belongs to the sub-family papilionaceae under the family leguminosae. In Bangladesh, it is popularly known as masur. Total production of lentil in Bangladesh, during 2018 -2019 was 175384 tons from an area of 351930 hectare with an average yield of 0.4984 t/ha. (BBS, 2020). In spite of many advantages of lentil the area coverage and the production are in declining trend. This trend is mainly because of pulses cannot complete with high yielding variety (HYV) cereals in terms of production and economic return and thus being pushed to marginal lands where nutrient deficiencies are severe. Due to favorable climate and soil, lentil can be grown successfully in Bangladesh. But the average yield of lentil in the country is low as compared with other leading lentil growing countries of the world.

In Bangladesh, the low yield of lentil may be attributed to many reasons such as lack of quality optimum seed rate, using local varieties as planting material, appropriate time of sowing, lack of judicious fertilizer application and specially decrease of organic matter in the soil. To meet up the protein demand for the increasing population, lentil production needs to be increased.

In Bangladesh, lentil is an excellent source of easily digestible protein, which complements the staple rice diet in the country. Lentil contains about 11% water, 25% protein and 60% carbohydrate (Singh *et al.,* 2001). It is also rich in iron, calcium and niacin. It is also delicious than other pulses. In developing countries like Bangladesh, pulse constitutes the major concentrate source of dietary protein. It is considered as poor man's meat as well as cheapest source of protein for under privileged group of people who cannot afford to buy animal protein *(*Gowda and Kaul, 1982). In Bangladesh, demand of pulses 25 lakh metric ton but production only 9 lakh metric ton each year. Approximately, 16 lakh metric tons of pulses are imported in Bangladesh each year (Bangla News, 2021).

The Stover of the plants together with husk popularly known as bhushi is high protein concentrated feed to cattle, horse, pig and sheep (Tomar *et.al.* 2000). Lentil can fix atmospheric nitrogen through root nodules by *Rhizobium bacteria* , which may reduce the pressure of nitrogenous fertilizer

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application to the crop. It is evident that pulse containing cropping pattern helped to increase the organic matter in the soil (Islam, 1988).

An improved variety is the first and foremost requirement for initiation and accelerated production program of any crop. Variety plays an important role in producing high yield of lentil because different varieties responded differently for their genotypic characters. BARI has developed some varieties of lentil. Among different released varieties of lentil BARI Masur-6, BARI Masur-7, BARI Masur-9 are mentionable for their growth performance, yield and quality. BARI Masur-6 is a high yielding variety and has insect and disease (rust and stemphylum blight) resistance power. BARI Masur-6 was released by the National seed Board in 2006 for cultivation in Rabi season in Bangladesh. BARI Masur-7 was F-3 population, which were examined in soil and environment of Bangladesh, this hybridization line was collected from ICARDA. BARI Masur-9 is a short duration crop and has disease (Leaf blight) resistance power. BARI Masur-9 was released by the National seed board in 2018 for cultivation in Rabi season in Bangladesh. Azad *et. al*. (2020). Thus, variety is an important role in producing high yield of lentil. The present study was, therefore undertaken to find out the effect of variety on the yield and yield component of lentil (*Lens culinaris* L.)

Materials and Methods

The study was conducted at Bangabandhu Academy for Poverty Alleviation and Rural Development (BAPARD) Agricultural farm field, Kotalipara, Gopalgonj during 18 November 2018 to 6 March 2019. Three improved variety of lentil (*Lens culinaris* L.) BARI Masur-6, BARI Masur-7 and BARI Masur-9 was used for the present study which was supplied from On Farm Research Division (OFRD), Bangladesh Agricultural Research Institute, Gopalgonj. The seeds were sown in the field on 18 November, 2018. At the rate of BARI Masur-6, BARI Masur-7, 30 kg/ha and BARI Masur-9, 70 kg/ha and in rows at a depth of 1-2 cm. from the soil surface. The distance between row to row and seed to seed were 25 cm and 5 cm, respectively. The crop was grown under rainfed condition.

The experiment was conducted in a randomized complete block design with 3 replications. The field was divided into 9 plots. The experiment plot size was 4.0×2.5 m^2. The chemical fertilizer doses were 45 kg urea, 90 kg TSP, 45 kg MoP, 55 kg gypsum, 3 kg zinc sulphate and 5 tons of cow dung were used as organic fertilizer per hectare (BARI, 2017). The total amount of cow dung and other chemical fertilizer were applied during the final land preparation. Irrigation, deweeding for plant protection measures and other intercultural operation were done during lentil (*Lens Culinaris* L.) cultivation as and when necessary.

The crop was harvested at fully maturity Varity BARI Masur-6, on 06 March, 2019, BARI Masur-7, on 28 February 2019 and BARI Masur-9 on 13 Februauy, 2019 respectively. The harvested crop was brought to the threshing door and dried for three days. Then the seed and straw were separated and cleaned. Data on crop characters were recorded at harvest. The yield contributing characters were recorded from 5 randomly selected plants in each plot and their mean values were determined. The yield was taken plot-wise by harvesting central 10 m^2 area of each plot and then it was converted to hectare basis. Data were collected on following parameters, plant height(cm), Number of branch/plant, Number of pod/plant, Number of seed/pod, 100 seed weight(g) and seed yield (kg/ha).

The collected data were analyzed statistically using the analysis of variance technique with the help of computer package MSTAT and mean difference were adjudged by Ducan's Multiple Ranged Test (DMRT) (Gomez and Gomez, 1984).

Results and discussion

Plant height

Maximum plant height was recorded with BARI Masur-6 (39.90 cm) and minimum was BARI Masur-9 (37.20 cm) (Table 1). The variety BARI Masur-6 gave the highest plant height (39.90 cm) which was statistically superior over BARI Masur-7 (37.20 cm) and BARI Masur-9 (38.98cm). Hanlan *et.al*. (2006) reported 0.3m to 0.44m plant height for different cultivars of lentil.

Number of branches per plant

Maximum mumber of branches was recorded with the variety BARI Masur-6 (20.67) and is found significant by increased over BARI Masur-7 (12.20) and BARI Masur-9(9.80) (Table 1). Hamdi *et. al.*

(2003) reported different number of branches per plant for different genotypes of plant.

Number of pods per plant

Maximum number of pods per plant was recorded from BARI Masur-6 (70.40) and minimum from BARI Masur-9 (35.33) (Table 1). It was observed that BARI Masur-6 is the best variety for number of pod per plant. Ezzat *et.al*. (2005) recorded the highest number of pod per plant from the genotypes FLIP 88-34L compared to the other genotypes studied.

Table 1. Effect of Variety on the yield and yield components of lentil

Variety	Plant height at harvest (cm)	Number of branch/Plant	Number of pod/plant	Number of seed/pod	100 seed weight (g)	Seed Yield (kg/ha.)
BARI Masur-6	39.90	20.67a	70.40a	1.40c	2.73	2224.81a
BARI Masur-7	37.20	12.20b	60.20a	1.60b	2.46	1904.81ab
BARI Masur-9	38.98	9.80b	35.33b	1.80a	2.59	1356.94b
F-test	NS	*	*	*	NS	*
CV (%)	5.65	18.75	8.26	4.89	4.75	15.39

In a Colum, figure with same letter do not differ significantly; * Significant at 5% level of significance; NS=Non significant

Number of seeds per pod and 100 seed Weight

The average number of seeds per pod varied from 1.40 to 1.80 (Table 1) maximum number of seeds per pod was recorded from BARI Masur-9 (1.80) and minimum from BARI Masur-6 (1.40). the Maximum 100 seed weight was recorded under variety BARI Masur-6 (2.73 g) and minimum with variety BARI Masur-7 (2.46 g) (Table 1) and 100 seed weight of BARI Masur-6 is the statistically superior over BARI Masur-7 and BARI Masur-9.

Seed yield

Seed yield varied from1356.94kg/ha to 2224. 81kg/ha (Table 1). The highest seed yield was recorded with variety BARI Masur-6, (2224.81kg/ha) followed by variety BARI Masur-7 (1904.81 kg/ha). The lowest seed yield was recorded with variety BARI Masur-9 (1356.94 kg/ha). The cultivar BARI Masur-6, BARI Masur-7 and BARI Masur-9 showed significant influence on seed yield. Rana (2009) found that the yield of BARI Masur-6 was given in his experiment, 2.29 t/ha.

Conclusion

The result of the present study showed that varieties of lentil are an important factor for increasing of BARI Masur-6, BARI Masur-7 and BARI Masur-9 yield and yield contributing character. It was demonstrated that cultivar of BARI Masur-6 had effective increase on number of pod per plant. 100 seed weight (g) and seed yield (kg/ha). BARI Masur-6 is the best variety for cultivar of BAPARD Agricultural Farm field. Finally, these findings will help our farmer for economically profit to cultivar of BARI Masur-6 than BARI Masur-7 and BARI Masur-9. It can be introduced all the districts of Bangladesh to increase the total production of lentil (*Lens culinaris* L.)

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