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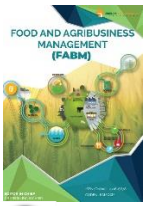

RESEARCH ARTICLE

EFFECT OF VARIETY AND PLANTING TIME OF YEAR-ROUND CHILLI PRODUCTION

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ABSTRACT

One of the most important vegetable and spice crops is the chilli (*Capsicum annuum L.*). This research was carried out at the RARS, Jamalpur 2019-2020 to 2020-2021 to find out the suitable variety and sowing time year-round chilli production for the demand of our country, nutrition supply and save foreign currency. All over Bangladesh, chillies are grown year-round, with the winter variety, which makes up around 70% of total production, being grown from October to April. Bangladesh has an extremely poor chilli yield because of variable rainfall, a small landmass, and ineffective fertilizer application. Due to inadequate irrigation and rainfall during the winter, output is hindered. Treatments included in the experiment were used two variety/cultivar BARI Morich-2 and commercial cultivar Bindu and three sowing time November, March and June which covers whole the year production. For year-round chilli production, November transplanting with BARI Morich-2 is preferable to other transplanting and variety. March transplanting both varieties is especially beneficial when there is a shortage of green chilli supply on the market during the early monsoon lag period. The establishment of June sowing is hindered by climate variables.

KEYWORDS

Planting Time, Variety, Year-Round, Chilli and Production

1. INTRODUCTION

One of the most significant horticultural crops in the world is capsicum annuum (Guevara et al., 2021; Martinez-Ispizua et al., 2021). Belonging to the Solanaceae family, it is said to have originated from Capsicum annuum L. var. glabriusculum and was domesticated there (Martinez-Ispizua et al., 2021). A common spice used in many meals is chilies (Duranova, et al., 2021). They are abundant in secondary metabolites like phenolics and capsaicinoids as well as primary metabolites like sugars and organic acids, particularly ascorbic acid (Zamljen, et al., 2022). Chilies are employed in various cuisines since they can be used as spices in sauces, chocolate, jelly, and meat (Ofori-Asenso, et al., 2021). It is widely cultivated and prized for its distinctive flavor, color, aroma, and chemical makeup, which includes medicinally and nutritionally significant carotenoids and capsaicinoids (Alam et al., 2018; Civan and Kumcuoglu, 2019; Idrees et al., 2020). Their fruits contain beneficial nutrients, minerals, and trace elements (Srivastava et.al 2019). This crop is continuously cultivated without regard to the seasons (Elizanilda, 2016).

The daily diet uses chilli peppers, both fresh and dried, in substantial amounts (Saleh, Omer, and Teweldemedhin, 2018). Chilli, an important spice crop of Bangladesh is widely grown both in winter and summer seasons. Area under chilli cultivation was 239203 acres producing about 149473 M Ton in Rabi and Kharif seasons respectively (BBS, 2020). In Bangladesh, chillies are grown in all the districts but plenty of chillies are produced in district of Bogra, Rangpur, Kurigram, Jamalpur, Natore and Jessore (BBS, 2020). In Bangladesh, chilli is grown round the year in all parts of the country while winter chilli is grown between the months of October to April and accounts for about 70% of total production. At least 32 local varieties are cultivated in Bangladesh (BBS, 2020). The average yield of chilli in Bangladesh is very low compared to other chilli growing countries in the world due to erratic rainfall and inefficient use of fertilizer (FAOSTAT, 2019). Heavy rainfall is a problem for chilli cultivation because chilli cannot tolerate heavy rainfall. In the winter, production is hampered due to lack of irrigation as well as minimum rainfall. Therefore, the experiment was undertaken to study.

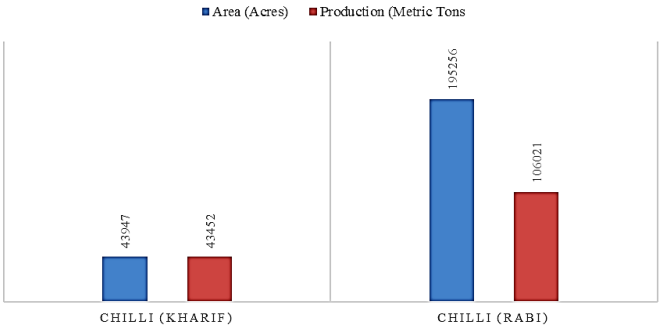

Figure 1: Crop growing area and production of chilli in Bangladesh (BBS, 2020)

2. METHODS AND MATERIALS

The experiment was carried out at the RARS research facility in Jamalpur, which is located at 24°56' north latitude and 89°55' east longitude. The

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location was on a medium-high piece of land in Agro-Ecological Zone 9, Old Brahmaputra Floodplain (UNDP and FAO, 1988). The typical annual rainfall is 1549.45mm (Regional Research Report 2019-2020). Treatments included in the experiment were: Variety: V1 = BARI Morich - 2, V2 = Bindu; Sowing time: S1 = November, S2 = March and S3= June. The experiment's layout was RCBD two factors with 3 replications. Each treatment was sown in unit plot having 3m × 3.2m with the spacing of 50 cm × 60cm. Spacing between two plots and replications were 1m and 1m respectively. Fertilizers were applied at the rate of 60-25-30-7-1-0.5 kg ha^{-1} NPKSZnB as urea, triple super phosphate (TSP), muriate of potash (MOP), gypsum, Boron (FRG, 2018). All of P, K, S, Zn and B; and ½ N should be applied as basal. Rest N will be applied at 25, 50 and 70 DAP. Seedlings were transplanted at November 14, 2019 in rows. Weeding was done when necessary. The entire map was used to determine grain yield. Five randomly chosen plants from the middle rows of each plot were used to extract the yield-contributing characteristics. Means were separated after the LSD test at the 5% level of significance. Data were analyzed using the computer program Statistic 8.0.

Table 1: Initial experimental soil's chemical characteristics at RARS, Jamalpur

Location	PH	OC (%)	OM (%)	N (%)	K Meq 100g^{-1}	P	S	Zn	B
						µg g^{-1}			
RARS, Jamalpur	7.2		0.89	0.045	0.23	7.73	5.74	0.40	0.37

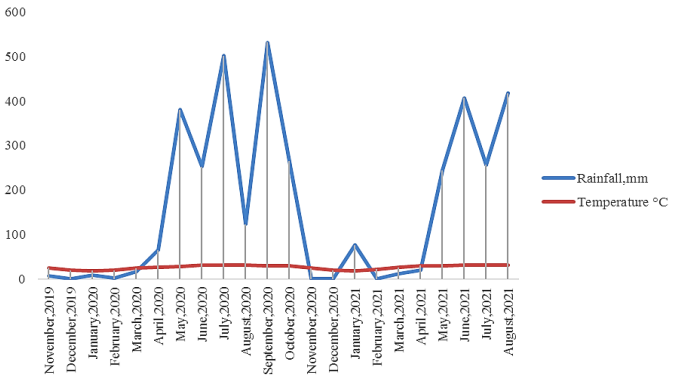

Figure 2: Rainfall and temperature data of crop growing period

3. Results and Discussion

3.1 Combined Effect of Transplanting Time and Variety

The data regarding number of branches per plant are furnished in table 3, significantly highest (no.6) from November × BARI Morich-2 and lowest (no.4) from March × Bindu. A perusal of data revealed that different combinations showed their significant influence on length of fruit. Significantly highest length of fruit (1.6cm) was recorded under March × BARI Morich-2 while November × Bindu was lowest (1.3cm) cause of weather condition (temperature and rainfall) the present findings agree together with those (Mirosavljevi et al., 2021; Sarkar et al., 2021). An appraisal of data table 3 indicated that different combinations exerted their significant consequence on yield. Significantly highest yield (18.02 t/ha) was registered under November × BARI Morich-2 while March × BARI Morich-2 was recorded the lowest (3.23 t/ha) because of harvest number and continuing data collection.

Table 2: Combined Effect of Transplanting Time and Variety on The Yield and Yield Contributing Characters of Chilli

Combined effect	No.of branch/plant	No.of fruit/plant	Plant height (cm)	50% flowering	Fruit length (cm)	Weight of fruit/plant (gm)	No. of harvest	Yield (t/ha)
November×BARI Morich-2	6	649	124.8	45	1.5	1498	7	15.02
November × Bindu	5	344	103	40	1.5	896	5	13.63
March × BARI Morich-2	5	87	105.2	47	1.6	193	3	6.23
March × Bindu	4	172	99.1	42	1.4	346	4	6.91
June × BARI Morich-2	0	0	0	0	0	0	0	0
June × Bindu	0	0	0	0	0	0	0	0
$LSD_{0.05}$	2.23	3.31	4.1	1.31	2.11	3.21	2.23	3.13
CV (%)	2.15	5.18	2.51	6.5	8.9	4.51	2.13	2.5

3.2 Cost and Return of Chilli

Gross return, cost of cultivation, gross margin and BCR of chilli have been presented in Table 3. The highest gross return (Tk.675900/ha), gross margin (Tk.536850/ha) and BCR (4.86) were observed in November × BARI Morich-2 followed by March × Bindu and the lowest gross return (Tk. 498400/ha), gross margin (Tk. 358350/ha) and BCR (3.56) were observed in March × BARI Morich-2.

Table 3: Cost and Return of Chilli Cultivation as Influenced by Interaction Effect of Transplanting Time and Variety

Interaction effect	Gross return (Tk. ha^{-1})	Cost of cultivation (Tk. ha^{-1})	Gross margin (Tk. ha^{-1})	BCR
November×BARI Morich-2	675900	139050	536850	4.86
November × Bindu	545200	138000	407200	3.95
March × BARI Morich-2	498400	140050	358350	3.56
March × Bindu	552800	139000	413800	3.98
June × BARI Morich-2	0	0	0	0
June × Bindu	0	0	0	0

Market price (Tk. Kg^{-1}):

BARI Morich-2 = 45 in November transplanting, 80 in March transplanting, 150 in June transplanting

Bindo = 40 in November transplanting, 75 in March transplanting, 145 in June transplanting

4. Conclusion

For year-round chilli production, November transplanting with BARI Morich-2 is preferable to other transplanting and variety. March transplanting both varieties is especially beneficial when there is a shortage of green chilli supply on the market during the early monsoon lag period. The establishment of June sowing is hindered by climate variables.

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