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Performance of Eggplant Hybrids for Summer Season of Bangladesh

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Abstract

The study on the performance of fourteen eggplant hybrids/variety was conducted at the experimental farm of Olericulture Division, Horticulture Research Centre, Bangladesh Agricultural Research Institute, Gazipur, Bangladesh during the summer season of 2016 to develop high yielding F_1 eggplant varieties tolerant to brinjal fruit and shoot borer and bacterial wilt and suitable for summer season cultivation. The lines varied significantly ($P < 0.05$) for their response to all character. The hybrid F_1 191BX259 took minimum 92.00days to first harvest, while the highest marketable fruits number per plant (99.50) was obtained by F_1 206X233 and the heaviest fruit was obtained from the F_1 225X216(104.30 g). There had no incidence was noticed of bacterial wilt infection at field level among 9 hybrids. The significant highest fruit yield (67.60 t/ha) was produced by F_1 206X233which was followed by F_1 225X216 (56.45 t/ha), F_1 220X221B (54.61 t/ha), F_1 222BX233 (53.63 t/ha), F_1 206X216 (50.28 t/ha), F_1 191BX259 (48.01 t/ha), F_1 203X233 (47.90 t/ha), F_1 77BX216 (47.26t/ha), while lowest was produced by F_1 48X221B (36.33 t/ha). Minimum infestation by BFSB was 3.86% was observed in F_1 206X233, while the infestation range was 3.86 -11.30%. The results of the present study revealed that eight hybrids viz., F_1 206x233, F_1 225x216, F_1 220x221B, F_1 222Bx233, F_1 206x216, F_1 191Bx259, F_1 203x233, F_1 77Bx216 were found promising for earliness, high yield, BFSB and bacterial wilt tolerance, fruit shape, fruit colour and may be put under trial for PYT in the next year summer season.

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Introduction

Eggplant is the most important vegetable crop in respect of total acreage (45,292 ha) and production (3,68,049 ton) in Bangladesh with an average yield of 8.13 tons per hectare (Anon, 2015), which is very low as compared to that in other eggplant producing countries. It is available in our country round the year. But the production in summer season is 131654 ton, while in winter is 236395 ton, which is quite low compare to winter season. There are several reasons behind this low production, like pest infestation, warm and humid climate, rainfall and scarcity of suitable summer variety.

There is a wide range of diversity in eggplant in respect of fruit shape, colour in our country. So if the diversified germplasm were being put into systematic hybridization program with specific desired traits, it is sure some high yielding hybrids with desired trait will be available. So there is a great scope of improvement for this crop through hybridization programme. Babu and Thirumurugan (2000)

reported 35.6% higher yield from crosses of 4 lines and 2 testers, Vijay and Nath (1974) reported 81.9% higher yield, Verma (1986) reported 13.0% higher yield in Punjab Bahar x Pusa Purple Long over the best parental line and Singh., *et al.* (1982) reported 140.19% higher yield over the better parent for yield in eggplant. With this information, the present study was undertaken to develop high yielding F1 eggplant varieties suitable for summer cultivation having tolerant to brinjal fruit and shoot borer and bacterial wilt.

Materials and Methods

The experiment was conducted at the experimental farm of Olericulture Division, Horticulture Research Centre (HRC), Bangladesh Agricultural Research Institute (BARI), Gazipur during the summer season of 2016. Thirteen eggplant hybrids viz., F_1 48x221B, F_1 77Bx216, F_1 191Bx259, F_1 203x233, F_1 204Ax221B, F_1 206x216, F_1 206x233, F_1 220x221B, F_1 220x259, F_1 222Ax216, F_1 222Bx233, F_1 225x216, F_1 236Cx216, along with BARI Hybrid Begun 3 (as check) were included in the study. The seeds were sown on the seedbed on 15 March 2016. Thirty days old seedlings were transplanted in the main field on 14 April, 2016. The experiment was laid out in RCB design with three replications. The unit plot size was 7.0 x 0.70 m and 10 plants were accommodated in a plot with a plant spacing of 70 cm apart in single row maintaining a row to row distance of 1 m with 30 cm drain. The land was fertilized with cow dung- N-P-K-S-Zn-B @ 10,000- 170-50-125-18-4.3-1.70 kg/ha, respectively. One third of the cow dung and half of P and full of S, Zn and B were applied during final land preparation. Rest of cow-dung and P and 1/3 of K were applied as basal in pit. Entire amount of N and rest of K were applied in four equal installment starting from 20 days after transplanting. Rest three installments were applied at vegetative, flowering and fruiting stage. The intercultural operations (weeding, irrigation, insecticide spray etc.) were done as and when necessary. Data on days to first harvest, fruit length (cm), fruit diameter (cm), average fruit weight (g), fruit weight/ plant (kg), plant height at 1st harvest (cm) and plant height at last harvest (cm), fruit yield (t/ha), fruit infestation by brinjal fruit and shoot borer (BFSB) (%), incidence of bacterial wilt, fruit colour, fruit shape were recorded from five randomly selected plants per entry per replication. The information on different quantitative characters was statistically analyzed using MSTAT C software.

Results and Discussion

Mean performances of growth parameters, yield, yield contributing characters and pest infestation of eggplant hybrids are presented in table 1, 2 and Figure 1, 2. The lines varied significantly ($P<0.05$) for their response to all characters. The hybrid F_1 191Bx259 took minimum 92.00days to first harvest, which was statistically similar to F_1 225x216 (92.60 days),closely followed by F_1 236Cx216 (95.67 days), F_1 220x259 (96.67 days) with indicates the earliness, The most delay harvested line was F_1 206x233(104.67 days). The highest marketable fruit number per plant (99.50) was obtained by F_1 206x233, followed by F_1 222Bx233 (45.93), F_1 206X216, F_1 220x221B (44.00), F_1 225x216 (42.10), while the lowest by F_1 48x221B (30.60). The heaviest fruits were obtained from the line F_1 225x216(104.30g) which was followed by F_1 77Bx216, F_1 222Ax216 (95.60 g), whereas the lightest fruit was observed from F_1 206x233(49.70 g). Significant variation was observed in fruit length and fruit diameter among the hybrids studied. The hybrid BARI Hybrid Begun 3 produced the longest fruit (18.16 cm) followed by F_1 222Ax216 (17.23 cm), while F_1 220x221Bproduced the shortest fruit (7.66 cm). Fruits of maximum diameter was produced by the line F_1 220x221B (5.63 cm) followed by F_1 220x259 (4.96 cm), F_1 203x233 (4.86 cm). The plant height at first and last harvest was 67.00 to 84.66 and 93.33 to 132.00 cm, respectively. In case of bacterial wilt infection at field level there were no incidence was noticed among the 9 hybrids viz., F_1 48x221B, F_1 77Bx216, $F_1$191Bx259, F_1 203x233, F_1 204Ax221B, F_1 206x216, F_1 206x233, F_1 220x221B, BARI Hybrid Begun 3, while 15-30% BW infection was noticed in 5 hybrids.

Hybrids	Days to 1st harvest	Number of marketable fruit	Average Fruit weight (g)	Fruit length (cm)	Fruit breadth (cm)	Plant height at 1st harvest (cm)	Plant height at last harvest (cm)	BW mortality (%)
F_1 48X221B	102.60 b	30.60 j	71.77 g	12.93 h	3.90 g	67.33 j	99.33 i	0.00 d
F_1 77BX216	102.67 b	36.36 g	95.60 b	15.80 c	3.90 g	84.66 a	125.33 b	0.00 d
F_1 191BX259	92.00 e	38.26 f	86.10 c	7.86 l	4.20 d	74.33 g	102.33 h	0.00 d
F_1 203X233	102.60 b	40.16 e	72.80 g	13.40 g	4.86 c	82.00 b	113.67 c	0.00 d

F_1 204AX221B	103.80 ab	32.53 i	73.00 g	10.06 k	4.10 e	72.33 h	107.00 f	0.00 d
F_1 206X216	98.67 c	44.00 c	62.30 i	11.03 j	3.90 g	71.33 i	93.33 k	0.00 d
F_1 206X233	104.67 a	99.50 a	49.70 j	15.30 d	3.70 h	82.00 b	106.00 g	0.00 d
F_1 220X221B	102.80 b	44.00 c	83.20 d	7.66 l	5.63 a	75.33 f	106.00 g	0.00 d
F_1 220X259	96.67 d	34.43 h	79.60 e	7.86 l	4.96 b	79.00 d	113.67 c	30.00 a
F_1 222AX216	102.60 b	32.53 i	95.60 b	17.23 b	4.00 f	77.00 e	108.67 e	20.50 b
F_1 222BX233	99.00 c	45.93 b	67.80 h	14.36 e	3.16 j	82.00 b	113.67 c	15.00 c
F_1 225X216	92.60 e	42.10 d	104.30 a	13.90 f	4.00 f	67.00 j	94.33 j	15.00 c
F_1 236CX216	95.67 d	36.36 g	75.50 f	11.46 i	3.43 i	77.00 e	110.67 d	15.00 c
BARI Hybrid Begun 3	103.67 ab	33.50 hi	82.07 d	18.16 a	2.76 k	81.00 c	132.00 a	0 d
Level of Sig.	**	**	*	**	**	*	**	*
CV %	6.24	7.85	6.94	5.64	5.27	4.25	6.87	6.58

Table 1: *Yield and yield contributing characters of 14 eggplant hybrids/variety during summer season, 2016.*

The significant highest fruit yield (67.60 t/ha) was produced by F_1 206X233 which was followed by F_1 225X216 (56.45 t/ha), F_1 220X221B (54.61 t/ha), F_1 222BX233 (53.63 t/ha), F_1 206X216 (50.28 t/ha), F_1 191BX259 (48.01 t/ha), F_1 203X233 (47.90 t/ha), F_1 77BX216 (47.26t/ha), while lowest was produced by F148X221B (36.33 t/ha). These eight hybrids viz., F_1 206X233, F_1 225X216, F_1 220X221B, F_1 222BX233, F_1 206X216, F1191BX259, F_1 203X233, F_1 77BX216 can be selected as high yielder hybrids.

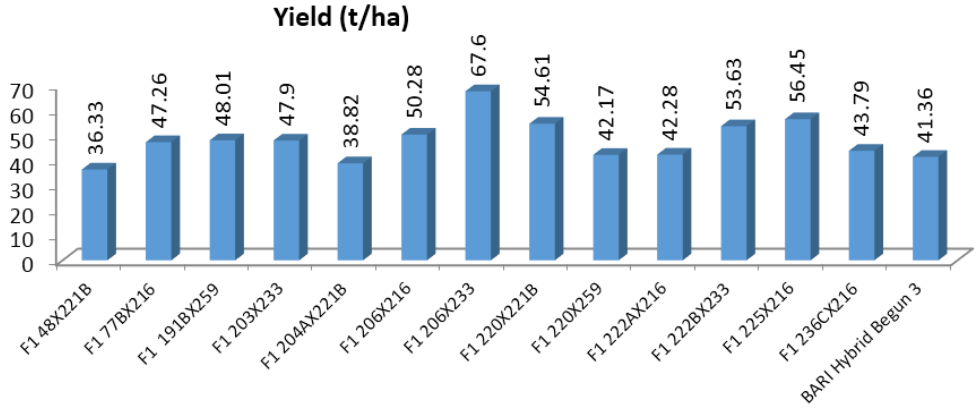

Figure 1: *Fruit yield (t/ha) of 14 eggplant hybrids/variety.*

Generally the incidence of BFSB is higher during summer season due to hot and humid condition. Minimum infestation by BFSB was 3.86% observed in F_1 206X233, while the infestation range was 3.86 -11.30%.

Fruit shape and fruit colour of eggplant are very important characters to the consumer and that is much diversified in the country. That is why these characters were considered during the study. Four types of fruit shape were observed viz., elongate (6 hybrids), oval (2 hybrids), oblong (5 hybrids), cylindrical (1 hybrid), while three types of colour viz., green (1 hybrid), purple (9 hybrids) and green + white spot at bottom (4 hybrid) were observed.

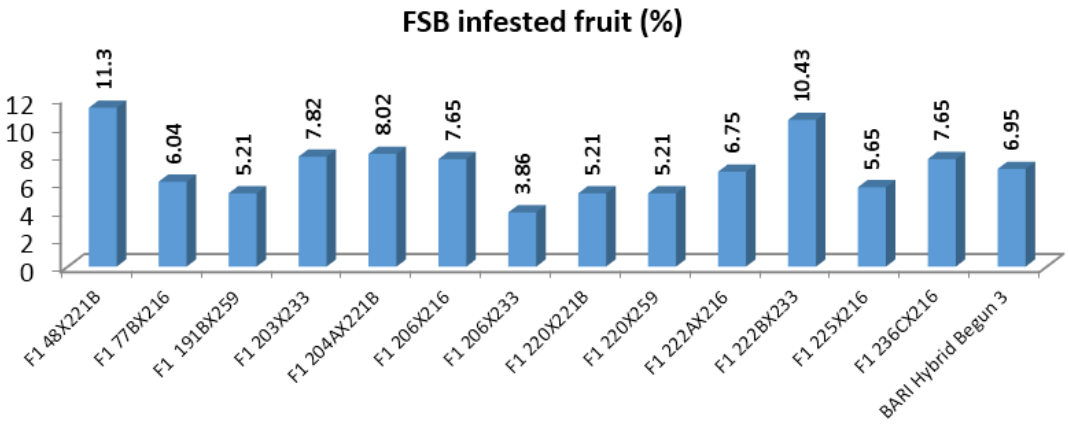

Figure 2: *Fruit infestation by BFSB of 14 eggplant hybrids/variety.*

Hybrids/Variety	Fruit shape	Fruit colour
F_1 48X221B	Oblong	Green + spot
F_1 77BX216	Elongate	Purple
F_1 191BX259	Oval	Green
F_1 203X233	Oblong	Purple
F_1 204AX221B	Oblong	Green + spot
F_1 206X216	Elongate	Purple
F_1 206X233	Elongate	Purple
F_1 220X221B	Oblong	Green + spot
F_1 220X259	Oval	Green + spot
F_1 222AX216	Elongate	Purple
F_1 222BX233	Elongate	Purple
F_1 225X216	Elongate	Purple
F_1 236CX216	Oblong	Purple
BARI Hybrid Begun 3	Cylindrical	Purple

Table 2: *Fruit shape and fruit colour of 14 eggplant hybrids/variety.*

Conclusion

Considering earliness, yield Performs BFSB and bacterial wilt tolerance, fruit shape and colour, seven hybrids viz., F_1 206X233, F_1 225X216, F_1 220X221B, F_1 222BX233, F_1 206X216, F_1 191BX259, F_1 203X233, F_1 77BX216 were found promising and may be put under trial for PYT in the next year summer season.

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