

CORRELATION STUDIES ON SEED YIELD AND FRUIT WEIGHT OF FOUR Bt EGGPLANT VARIETIES

M. K. HASAN¹, M. O. HOQUE², M. R. ISLAM³
D. KHANAM¹ AND M. S. ALAM⁴

Eggplant (*Solanum melongena* L.) commonly known as ‘brinjal’ or ‘aubergin’ is one of the most popular vegetables in Bangladesh as well as in the world. It is cultivated across the country throughout the year. It is an important vegetable crop in Bangladesh next to potato and tomato in terms of area and production that covers about 32 thousand ha of land with total productions of 355 thousand metric tons during winter season of 2017-18 (BBS, 2019). The major constraints of brinjal cultivation is the shoot and fruit borer (BSFB) which infests tender shoot tips and growing fruits and cannot be controlled easily by spraying insecticides. The development of Bt brinjal involves the introduction of Cry1Ac gene (isolated from soil bacterium, *Bacillus thuringiensis*) resistant against BFSB. Upon approval the commercialization, Bangladesh becomes the first country in the world to approve four varieties of Bt eggplant in 2013. Bt eggplant provides essentially complete control of eggplant fruit and shoot borer, dramatically reduces insecticide sprays, provides a six fold increase in grower profit, and does not affect non target arthropod biodiversity (Shelton *et al.*, 2019). It has gotten off to a good start with increased yearly adoption and very favorable socioeconomic benefits, it was distributed among the 20 farmers in 2014 due to rapid adoption, 27012 farmers used this technology in 2018 (Shelton *et al.*, 2018). Seed yield per fruit varied significantly among the varieties (Rahman *et al.*, 2015). An effort was made to find out the relationship between seed yield and fruit weight in this present study. The breeder seed production of four Bt eggplant varieties viz., ‘BARI Bt Begun-1’, ‘BARI Bt Begun-2’, ‘BARI Bt Begun-3’ and ‘BARI Bt Begun-4’ was carried out in four locations viz. Rangpur, Barishal, Gazipur and Bagura, respectively during 2018-19 under the supervision of Biotechnology Division, BARI, Gazipur. Standard crop management practices like land preparation, fertilization, irrigation, drainage, roughing, weeding clipping of side branches, harvesting, seed extraction, drying etc. were followed in seed production (Hasan *et al.*, 2017). Twenty five ripe fruits were randomly selected from each of BARI Bt eggplant varieties to make correlation between fruit weight with seed weight and number of seed. After extraction, seeds were dried to maintain a moisture level of about 6-8%. Seed weight of each fruit was weighted and expressed in gram. Number of seed from each fruit was counted. Fruit weight was plotted in X-axis; where, seed weight and number of seeds were

¹Biotechnology Division, Bangladesh Agricultural Research Institute (BARI), Gazipur, ²Regional Agricultural Research Station (RARS), Burirhat, Rangpur, ³RARS, BARI, Rahmatpur, Barishal, ⁴On Farm Research Division, BARI, Chelopara, Bogura, Bangladesh.

plotted in Y axis of MS-excel program. Relationship of fruit weight and seed yield of four Bt eggplant varieties is presented in the Fig.1. Seed weight increased with the increasing of fruit weight. The relationship was significant at $p \leq 0.05$. The functional relationship between fruit weight and seed weight implies the seed weight could be increased at the rate of 0.0203, 0.0138, 0.0215 and 0.0155 g with an increase in 1 g of fruit weight in ‘BARI Bt Begun-1’, ‘BARI Bt Begun-2’, ‘BARI Bt Begun-3’ and ‘BARI Bt Begun-4’, respectively. Relationship of fruit weight and number of seeds of four Bt eggplant varieties is presented in the Fig.2. Like seed weight, number of seed per fruit also increased with the increasing of fruit weight. There was a positive and significant correlation between fruit weight and number of seeds per fruit. It might be due to bigger fruit size which contained more seeds. This finding is in agreement with Angadi *et al.*, 2017 and Islam and Hasan, 2018. On an average, individual fruit weight, seed weight per fruit and number of seed per fruit is presented in the Table 1. The ratio of fruit weight and seed weight was varied from 35:1 to 40:1 in four different varieties. This information may be helpful to estimate the amount and number of seeds from fruit of Bt eggplant varieties.

Bt eggplant is a new genetically engineered crop in Bangladesh. It has great potentiality and high demand in the country. From the equations of Fig. 1 and Fig. 2, a seed producer may predict how much and number of seeds would be produced from the four Bt eggplant varieties.

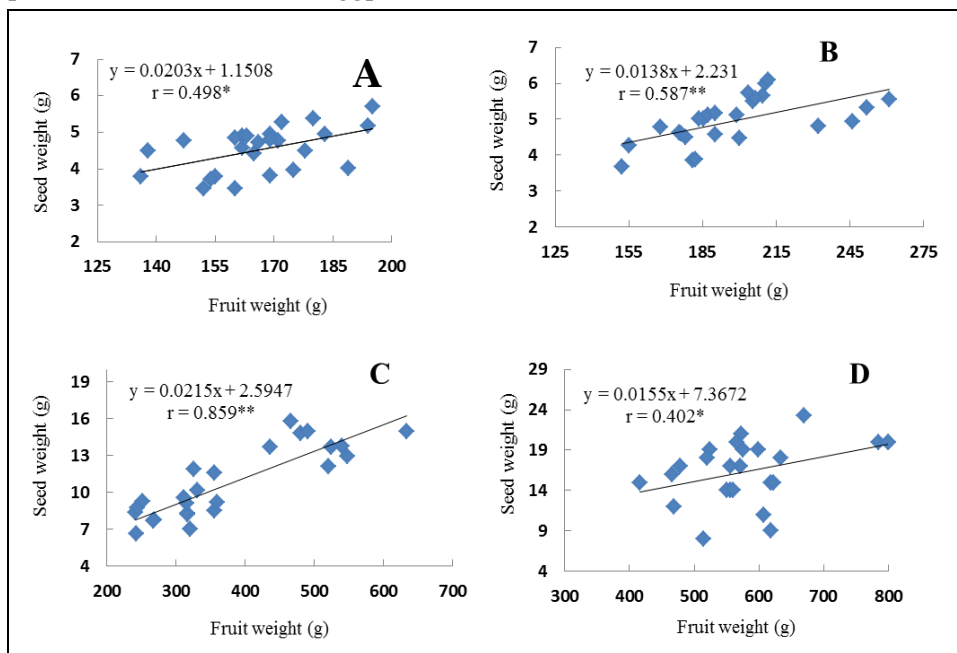


Fig. 1. Relationship between fruit weight and seed yield of different Bt eggplant varieties; A) ‘BARI Bt Begun-1’, B) ‘BARI Bt Begun-2’, C) ‘BARI Bt Begun-3’ and D) ‘BARI Bt Begun-4’.

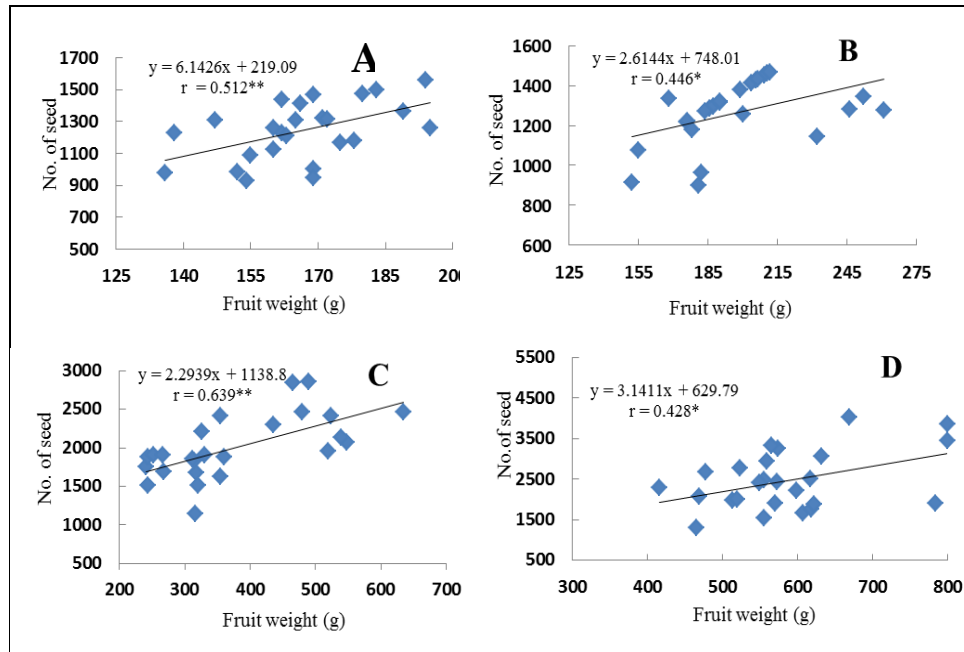


Fig. 2. Relationship between fruit weight and number of seeds of different Bt eggplant varieties; A) 'BARI Bt Begun-1', B) 'BARI Bt Begun-2', C) 'BARI Bt Begun-3' and D) 'BARI Bt Begun-4'.

Table 1. Average fruit weight, seed weight per fruit and number of seed per fruit from different Bt eggplant varieties

Variety	Individual fruit weight (g)	Seed weight per fruit (g)	Number of seeds per fruit	Fruit wt.: Seed wt.	Fruit yield for seed purpose (t/ha)	Seed yield (kg/ha)
'BARI Bt Begun-1'	166.56±15.22	4.52±0.62	1242±182	37	12.03	302
'BARI Bt Begun-2'	197.67±27.67	4.95±0.65	1265±162	40	13.26	343
'BARI Bt Begun-3'	378.44±114.91	10.73±2.87	2007±411	35	10.33	276
'BARI Bt Begun-4'	585.88±98.12	16.49±3.78	2470±720	35	9.68	256

Data shown in average with standard deviation

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