



Efficacy of Mixed Fertilizers (NPK) and Gibberellic Acid (GA₃) Solution on Growth and Yield of Quality Tomato (*Lycopersicon esculentum* Mill.)

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Abstract: Tomato is one of the most important edible and nutritious vegetable crops cultivating with different fertilizers management in Bangladesh. Thus, investigation was carried out so as to identify the effect of mixed fertilizers (NPK) and gibberellic acid (GA₃) on growth, yield and yield contributing characters of quality tomato at the farm of horticulture in the Department of Crop Science and Technology, University of Rajshahi during the period from October, 2018 to March, 2019. The two factors experiment included four levels of mixed fertilizers(NPK) viz., F₀ (0 kg N/ha + 0 kg P/ha + 0 kg K/ha), F₁(200 kg N/ha + 100 kg P/ha + 160 kg K/ha), F₂ (225 kg N/ha + 125 kg P/ha + 180 kg K/ha) and F₃ (250 kg N/ha + 150 kg P/ha + 200 kg K/ha, and three(3) levels of GA₃ solution viz., 0 , 50 and 70 ppm, respectively. The trial was designed in Randomized Complete Block Design (RCBD) with three (3) replications. The results indicated that the most of the parameters studied (viz., plant height, number of leaves per plant, number of branches per plant, number of flowers clusters per plant, number of flowers per cluster, number of fruit clusters per plant, number of fruits per plant, fruit diameter, fruit yield (t/ha) were found highly significant as influenced by different mixed fertilizers (NPK) as well as GA₃ solutions. The highest tomato yield (41.33 t/ha) was recorded from 225 kg N/ha+125 kg P/ha+180 kg K/ha and the lowest yield (35.89 t/ha) was recorded from control. The response of GA₃ solution was found to be significant in all the characters of tomato and the highest yield (41 t/ha) was recorded from 50 ppm GA₃ solution, while the lowest yield (37.17 t/ha) was recorded from control. The combined effect of mixed fertilizers (NPK) and GA₃ solution were found to be significant in most of the characters studied. The highest yield (44 t/ha) was achieved from 225 kg N/ha + 125 kg P/ha + 180 kg K/ha along with 50 ppm GA₃ solution while the lowest yield (34 t/ha) was recorded from control. So, it can be concluded that 225 kg N/ha + 125 kg P/ha + 180 kg K/ha along with 50 ppm GA₃ solution is found suitable combination as it shows better performance for growth, yield and yield contributing characters of quality tomato. Therefore, our farmers may adopt this combination for quality tomato production.

Keywords: Mixed Fertilizer (NPK); Gibberellic Acid; Growth; Yield; Tomato.

INTRODUCTION

Tomato (*Lycopersicon esculentum* Mill.) is one of the great momentous edible and palatable vegetable crops grown in Bangladesh under the solanaceae family. It is generated in tropical America. The present directing tomato cultivating countries of the universe are China, United States of America, India, Egypt, Turkey, Iran, Italy, Mexico, Brazil and Indonesia (FAO. 2002). Among the winter vegetable crops cultivated in Bangladesh, tomato states second in terms of production and third in terms of area (BBS, 2004). It is produced to all over the country due to its adaptability and productivity to wide range of soil and

climate (Ahmad, 1976). It is a nutritious vegetable used as salads, soups and various products like ketchup, sauce, and chutney. It is frequently called to as 'the poor man's orange' owing to its sufficient quantity of vitamin, malic acid and citric acid contents. The presentable color of fruit is due to pigment, lycopene. The pigment appearing in tomato act as an antioxidant. Its food value is very rich because of its greater quantities of vitamins A, B and C including calcium and carotene (Bose and Som, 1990). It has a useful role in human nutrition. It contains a high source of lycopene, minerals and β-carotene representing anti-oxidants activities and keeping our sound health. It requires a greater

amount of readily available nitrogen nutrients. (Gupta and Shukla, 1977). Potassium is especially significant in a multi-nutrient fertilizer application (Brady, 1995). Its application compensates flower number, peduncle length, fruit set and number of fruit (Besford and Mann, 1975). It has proficient influence on the quality of tomato fruits, especially on fruit color (Wall, 1940) and also has successful role on balancing physiological activities. Phosphorus plays a serious role the plant in the earliest stages of development and expedites the reproductive fruiting process. It also rectifies the skin color, pulp, taste, hardness and vitamin C. Nitrogen, phosphorus and potassium are appraising for tomato growth and development (Jones, 2008). The gibberellic acid is also an immense growth stimulating constituents used in agriculture. It may encourage in cell elongation, cell division and thus favor in growth and development of tomato plant. Application of gibberellic acid on flowers helps to control fruit dropping in tomato (Feofanova, 1960). Under the ground, a piece of research work was started with the intension of determining of the optimum dose of mixed fertilizer (NPK) for quality tomato production, finding out the optimum dose of GA₃ solution, making out a suitable combination of mixed fertilizer (NPK) and GA₃ for ensuring the maximum growth, yield and quality of tomato as well as recommending a desired method for our farmers for execution of quality tomato production.

MATERIALS AND METHODS

Experimental site

The trial was performed at the horticulture farm of the Department of Crop Science and Technology of the University of Rajshahi during the period from October, 2018 to March, 2019. Seedlings of tomato were sown on November 4, 2018 and harvested gradually from January to March, 2019. The location site accomplishing the trial was 24.370°N and 88.637°E latitude and 200 m from the sea level belonging to the Agro Ecological Zone (AEZ)-11 " High Ganges River Flood Plain."

Materials and treatments used in the experiment

The tomato variety practiced in the experiment was BARI Tomato-14. It was a high yielding, heat tolerant and indeterminate type. Seeds were taken out from Nowdapara Bazar, Rajshahi. The two factors experiment comprising of four levels of mixed fertilizer (NPK), namely Fo= control, F1= 200 kg N/ha + 100 kg P/ha + 160 kg K/ha, F2= 225 kg N/ha + 125 kg P/ha + 180kg K/ha and F3= 250 kg N/ha + 150 kg P/ha + 200 kg K/ha and three levels of GA₃ solution viz., G0= control, G1=50 ppm and G2= 70 ppm, respectively were assembled

Experimental design and layout

The field layout was accomplished after final land preparation. The experiment was adjusted in a Randomized Complete Block Design (RCBD) with three replications. The total plots were distributed into three blocks bearing twelve (12) plots with the size of 2 m x 1.8 m including 36-unit plots. The vacant space was kept 1 m between the

blocks and 0.5 m in between the plots. The length between row to row and plant to plant was 60 cm and 40 cm, respectively. Each plot accommodated 15 plants.

Application of manure and fertilizers

The sources of N, P, and K found from Urea, TSP and MP, respectively were exercised as per treatment. Cowdung was also practiced at the rate of 10 t/ha (Razzaket al., 2000). The total quantity of well-decomposed cow dung was imbedded instantly after ploughing the land, and the total amount of TSP was taken up as basal dose at the time of final land preparation. The urea and MP were embedded in two equal installments. The first implication was done after two weeks from transplanting and the second attachment was done after two weeks from the first fertilization.

Preparation and application of GA₃ solution

With a view to preparing desired quantity of GA₃ solution (viz., 50 ppm and 70 ppm) as for experimental treatment, fifty (50) mg and seventy (70) mg of GA₃ solute were dissolved separately in 1 liter of water solvent using the little amount of ethanol for well mixer of solution. After preparation, this solution was applied at 15 days interval on crop field at 20, 35, 50 days of transplanting.

Transplanting of seedlings

More or less uniform size of 20 days old seedlings were uprooted separately from the seed bed and were transplanted in the experimental plots in the afternoon of November 4, 2018 with a spacing of 60 cm x 40 cm between the rows and the plants, respectively. It accommodated of 15 plants in each plot. The seedbeds were watered before uprooting the seedlings from the seedbed so as to minimize the damage of the roots. The seedlings were watered after planting. Shading was insured with the help of leaf sheath of banana for continuous three days after planting for protecting the seedling from the scorching sunlight and it was dispelled after the establishment of seedling. Extra seedlings were also planted surroundings the border area of the experimental plots for gap filling.

Data collection and analysis

Ten plants were chosen at random from each unit plot for data procurement in such a way that the margin outcome could be cancelled at the highest precision. Data of different characters were assembled as plant height (cm), number of leaves per plant, number of branches per plant, number of flower clusters per plant, number of flowers per cluster, number of fruit clusters per plant, number of fruits per plant, fruit diameter (cm) and fruit yield. The compiled data were analyzed using MS state C and compared with Duncan's Multiple Range Test (DMRT) according to Gomez and Gomez (1984).

RESULTS AND DISCUSSION

Effect of mixed fertilizers (NPK): Mixed fertilizers (NPK) greatly influenced on the growth, yield and yield favoring characters of tomato and the results are illustrated in figure 01–03 and table 01-2. Enhancing levels of mixed fertilizer (NPK) gradually increased plant height and numbers of leaves per plant with the advance of times at different days after transplanting followed by control (Fig.1-2). These fertilizers having increasing levels also augmented the number of flowers, number of flower clusters, number of flowers per cluster, number of fruit clusters, numbers of fruits per plant, fruit diameter and fruit yield ton per hectare as compared to control. The highest fruit yield (41.33 t/ha) was gained from F2 (namely 225 kg N/ha + 125 kg P/ha + 180kg K/ha and 250 kg N/ha + 150 kg P/ha + 200 kg K/ha), while the lowest fruit yield (35.89 t/ha) was gained from control (Fig. 3). Probably macro nutrients (F₂) ensured to augment the favorable condition for growth of tomato in respect of plant height and number of leaves per plant along with other growth and yield achieving characters of tomato resulting in the tallest plant and a greater number of leaves per plant with other parameter whereas above of this level of NPK fertilizers hinder the growth trend. Melton and Dufault (1991) reported that plant height of tomato was raised at highest level using nitrogen. Chung *et al.*, (1992) narrated that plant height was increased with the augmented nitrogen rates. Kuksal *et al.*, (1977) also indicated that nitrogen implication at higher rates raised the plant height. Potassium enhanced plant height up to maximum doses with an increasing trend. Murphy (1964) placed a favorable light that the application of potassium accelerated plant height up to 65%. The results are in agreements with the narration of Besford and Mann, (1975). Similarly, Islam *et al.*, (1997) stated that 250 kg nitrogen per hectare provided the highest fruit yield. Significant impact of nitrogen level for raising tomato yield was described by Doss *et al.*, (1981), Midan *et al.*, (1985) and Kaniszewski *et.al.*, (1987) found a significant increase in total yield of tomato fruit in the nitrogen fertilization up to 225 kg N/ha. Nassar (1986) denoted that the maximum yield was achieved at 296 kg N/ha. Pansare *et.al.*, (1994) reported that the maximum yield tomato was obtained when straight fertilizers were added in the 100 kg k₂O per hectare. Solaiman and Rabbani (2006) reported that the recommended doses of NPK gave the highest fruit yield.

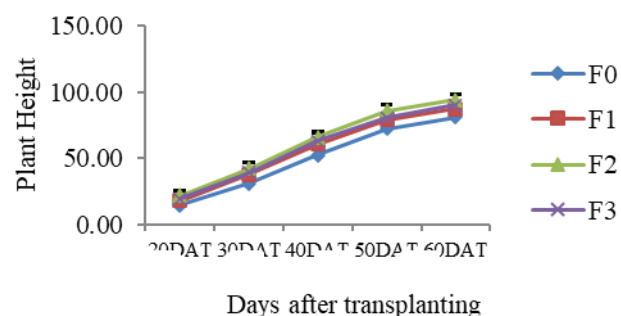


Figure 1: Impact of NPK fertilizer dose on plant height of tomato at different days after transplanting. Vertical bars illustrate as LSD at 1% level of probability.

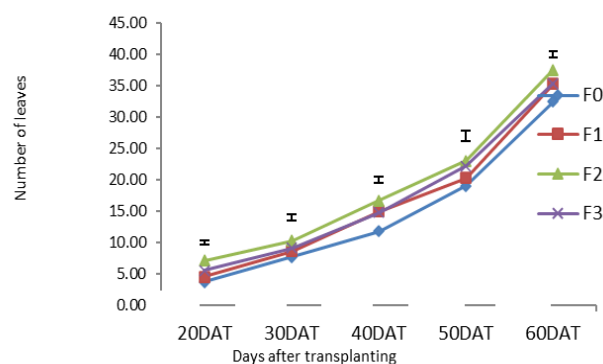


Figure 2: Influence of NPK fertilizer dose on number of leaves per plant at different days after transplanting. Vertical bars illustratet as LSD at1% level of probability.

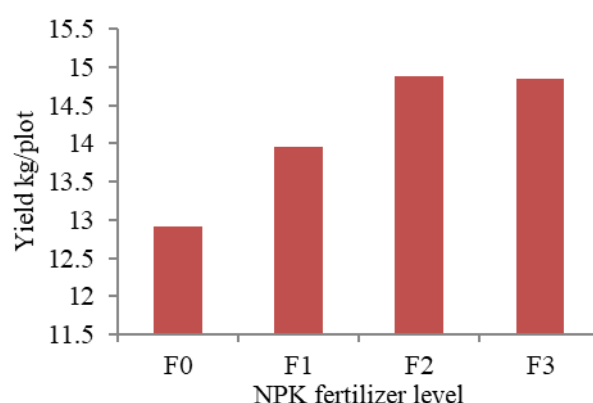


Figure 3: Effect of fertilizer (NPK) doses on yield (kg/plot) of tomato

Effect of gibberellic acid solution: Gibberellic acid solution had highly significant effect on the growth, yield and yield favoring characters of tomato and the results are presented in figure 03-06 and table 2.-4. Increasing levels

of gibberellic acid solution gradually increased plant height and numbers of leaves per plant with the increase of times at different days after transplanting as compared to control (Fig.04-05). Gibberellic acid solution with increasing level also augmented number of branches, number of flowers, number of flower clusters, number of flowers per cluster, number of fruit clusters, numbers of fruits per plant, fruit diameter, and fruit yield ton per hectare. The highest fruit yield (41.00 t/ha) were achieved from 50 ppm GA₃ solution and, the lowest fruit yield (37.17 t/ha) were achieved from control (Fig. 06). Shittu and Adeleke (1999) reported the similar findings. Mehrotra *et al.*, (1970) narrated the positive raising in plant height (95 cm) with GA₃ spray at flower initiation stage in tomato. Spraying with GA₃ solution showed positive impression in plant height with increased concentration. The similar results are reported by the findings of Feofanova (1960). Saleh and Abdul (1980) in their research admitted with the findings of the present study. Satti and Oebekar (1986) denoted an increase behavior in fruit set of tomato owing to the implication of GA₃ solution at 25 ppm at various stages of inflorescence development. Similar findings were reported by Islam *et al.* (1997). They indicated that the breadth of individual fruit was fast augmented with the increase of nitrogen levels. Nassar (1986) also admitted the similar results. Kaushik *et al.*, (1974) supported these findings.

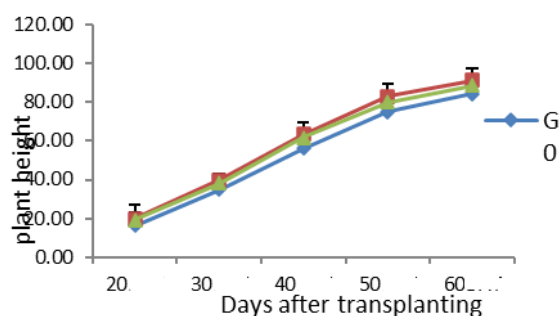


Figure 4: Influence of GA₃ solution on plant height of tomato at different days aft. Vertical bars indicate LSD at 1% level of probability

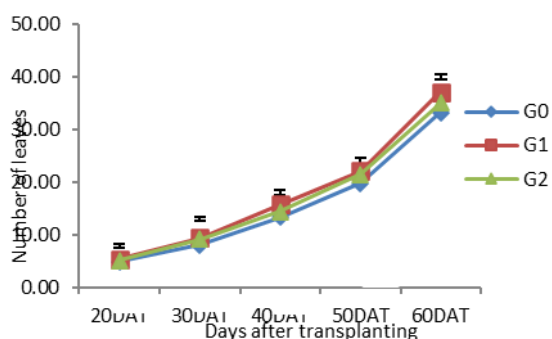


Figure 5: Impact of GA₃ solution on number of leaves per plant at different days. Vertical bars denote as LSD at 1% level of probability.

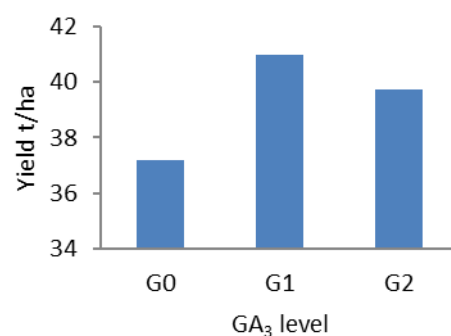


Figure 6: Influence of GA₃ on yield of quality tomato (t/ha)

Table 1. Effect of mixed fertilizers (NPK) on growth, yield and yield producing characters of tomato

Treatment	No. of branch/ plant	No. of flower/ cluster	No. of flower cluster/ plant	No. of flower / plant
F ₀	3.42 d	3.38 d	8.56 c	29.11 c
F ₁	4.00 c	3.89 c	12.09 b	35.33 b
F ₂	4.84 a	5.13 a	13.00 a	38.33 a
F ₃	4.40 b	4.74 b	12.67 a	38.33 a
Levels of significance	0.01	0.01	0.01	0.01
CV(%)	5.86	5.76	3.17	1.97

Table 02. Effect of mixed fertilizers (NPK) on growth, yield and yield favoring characters of tomato

Treatment	No. of fruit cluster/plant	No. of fruit /cluster	No. of fruit plant	Fruit diameter (cm)r
F ₀	3.31 c	3.07 c	10.67 c	4.40 d
F ₁	3.98 b	3.58 b	13.33 b	4.99 c
F ₂	5.18 a	4.79 a	16.56 a	5.81 a
F ₃	4.89 a	4.39 a	16.56 a	5.34 b
Levels of significance	0.01	0.01	0.01	0.01
CV(%)	8.68	6.59	6.15	3.62

Table 3. Influence of Gibberellic acid (GA₃) solution on growth, yield and yield enhancing characters of tomato

Treatment	No. branch/ plant	No. of flower/ cluster	No. of flower cluster/ plant	No. of flower / plant
G ₀	3.60 c	3.75 c	10.28 c	31.42 c
G ₁	4.83 a	4.89 a	12.70 a	37.75 a
G ₂	4.07 b	4.22 b	11.75 b	36.67 b
Levels of significance	0.01	0.01	0.01	0.01
CV(%)	5.86	5.76	3.17	1.97

Table 4. Influence of Gibberellic acid (GA₃) solution on growth, yield and yield accelerating characters of tomato

Treatment	No. of fruit cluster/plant	No. of fruit /cluster	No. of fruit plant	Fruit diameter
G ₀	3.62 c	3.43 c	12.00 b	4.56 c
G ₁	4.97 a	4.49 a	15.67 a	5.72 a
G ₂	4.43 b	3.89 b	15.17 a	5.13 b
Levels of significance	0.01	0.01	0.01	0.01
CV(%)	8.68	6.59	6.15	3.62

In a column bearing similar letter(s) do not agree and dissimilar letter (s) agree significantly as per 5% and 1% level of probability.

Here, F₀=control,

G₀ = 0 ppm,

F₁=200 kgN/ha+100 kg P/ha+160kg K/ha

G₁ = 50 ppm,

F₂= 225 kg N/ha+125 kg P/ha+180 kg K/ha

F₃=250 kg N/ha+150 kg P/ha+200 kg K/ha

G₂ = 70 ppm.

Combined effect of mixed fertilizers (NPK) and GA₃ solution:

The combination of different mixed fertilizers (NPK) and GA₃ solution on growth, yield and yield determining parameters of tomato were found significant except at 20th day of transplanting in terms of plant height and the results are presented in table 5-8. The augmentation of the dose of the combination of mixed fertilizers (NPK) and gibberellic acid solution demonstrated an increasing trend in terms plant height and number of leaves per plant as compared to control.(Table 05-06) Another characters, namely number of branches, number of flowers, number of flower clusters, number of flowers per cluster, number of fruit clusters, numbers of fruits per plant, fruit diameter,

and fruit yield ton per hectare were being observed in increasing trend with the increase levels of the combination of mixed fertilizers (NPK) and GA₃ solution followed by control. The treatment combination of F₂G₁ gave the maximum yield (44.00 t/ha) and the minimum yield (34.00 t/ha) was obtained from F₀G₀ (Table 07-08). These results are in coincided with the findings of Feofanova (1960). Garrison *et.al.*, (1967) indicated that the rising levels of nitrogen enhanced to augment flower formation of several clusters of tomato.

Table 5. Combined effects of Mixed fertilizers (NPK) and Gibberellic acid solution (GA₃) on the plant height of tomato at different days after transplanting

Plant height(cm) at different days of transplanting					
Treatment	20	30	40	50	60
F ₀ G ₀	14.04 f	29.33 g	51.50 g	71.12 h	79.56 g
F ₀ G ₁	14.74 f	31.75 fg	53.42 fg	73.49 gh	82.46 ef
F ₀ G ₂	14.48 f	31.63 fg	52.03 g	72.49 gh	81.57 f
F ₁ G ₀	15.34 ef	32.61 f	54.62 fg	75.37 fg	83.44 ef
F ₁ G ₁	20.43 a-c	41.50b-d	65.18 bc	83.45 cd	91.35 c
F ₁ G ₂	18.54 c-e	39.70 c-e	62.74 cd	77.64 ef	87.44 d
F ₂ G ₀	19.41 b-d	39.59 de	60.75 de	79.73 de	89.69 cd
F ₂ G ₁	23.55 a	44.24 a	69.11 a	90.23 a	97.65 a
F ₂ G ₂	22.60 ab	42.73 ab	67.29 ab	88.15 ab	95.21 ab
F ₃ G ₀	15.92 d-f	37.66 e	57.24 ef	74.76 f-h	84.64 e
F ₃ G ₁	21.35 a-c	42.18 a-c	65.95 a-c	85.28 bc	94.61 b
F ₃ G ₂	20.68 a-c	38.60 e	65.52 a-c	81.62 cd	90.56 c
Level of Significant	NS	**	*	*	*
CV (%)	8.54	2.97	3.74	2.81	1.73

In a column containing similar letter(s) do not vary and dissimilar letter (s) vary significantly as per 5% and 1% level of probability.

Here, F₀=control,

G₀ = 0 ppm,

F₁=200 kgN/ha+100 kg P/ha+160kg K/ha

F₂= 225 kg N/ha+125 kg P/ha+180 kg K/ha

G₁ = 50 ppm,

F₃=250 kg N/ha+150 kg P/ha+200 kg K/ha

G₂ = 70 ppm.

Table 6. Combined impact of mixed fertilizers (NPK) and gibberellic acid solution (GA₃) on the number of leaves per plant of tomato at different days.

No of leaves at different days of transplanting					
Treatment	20	30	40	50	60
F ₀ G ₀	3.53 g	6.47 f	11.20 h	18.33 g	30.33 j
F ₀ G ₁	3.60 g	7.87 e	12.60 g	19.20 fg	34.67 fg
F ₀ G ₂	3.80 g	8.73 d	11.47 h	19.67 e-g	32.47 i
F ₁ G ₀	4.07 fg	13.13	18.60 g	33.80	gh
F ₁ G ₁	4.87 de	9.47 b-	16.87 b	21.80 cd	36.80 bc
F ₁ G ₂	4.60 ef	8.80 d	14.80 c-e	20.40 d-f	35.20 ef
F ₂ G ₀	6.53 b	9.73 bc	15.33 cd	20.80 de	35.80 de
F ₂ G ₁	7.93 a	10.80 a	18.00 a	24.80 a	40.00 a
F ₂ G ₂	6.73 b	10.20 ab	16.80 b	23.53 ab	36.73 b-d
F ₃ G ₀	5.40 cd	8.80 d	13.93 ef	21.47 cd	32.93 hi
F ₃ G ₁	5.47 cd	9.53 b-	15.67 c	22.73 bc	37.27 b
F ₃ G ₂	5.73 c	9.00 cd	14.73 de	22.47 bc	35.87 c-e
Level of Significant	**	**	**	**	**
CV(%)	5.69	4.17	2.73	2.89	1.20

Table 7. Combined efficacy of mixed fertilizers (NPK) and gibberellic acid solution (GA₃) on growth, yield and yield enhancing characters of tomato

Treatment	No. of branch/plant	No. of flower/cluster	No. of flower/cluster/plant	No. of flower / plant
F ₀ G ₀	3.07 g	3.00 g	7.53 g	26.67 i
F ₀ G ₁	3.80 d-f	3.73e f	9.27 f	31.00 h
F ₀ G ₂	3.40 fg	3.40 fg	8.87 f	29.67 h
F ₁ G ₀	3.60 e-g	3.53 fg	10.47e	31.00 h
F ₁ G ₁	4.80 bc	4.20 de	13.20 bc	37.00 e
F ₁ G ₂	3.60 e-g	3.93 ef	12.60 cd	38.00 de
F ₂ G ₀	4.07d e	4.27 de	11.07 e	33.00 g
F ₂ G ₁	5.47 a	6.13 a	14.53 a	42.00 a
F ₂ G ₂	5.00 ab	5.00 bc	13.40 bc	40.00 bc
F ₃ G ₀	3.67 ef	4.20 de	12.07 d	35.00 f
F ₃ G ₁	5.27 ab	5.50 b	13.80 ab	41.00 ab
F ₃ G ₂	4.27 cd	4.53 cd	12.13 d	39.00 cd
Levels of	0.01	0.01	0.01	0.01

significance				
CV(%)	5.86	5.76	3.17	1.97

Table 8. Combined efficacy of mixed fertilizers (NPK) and gibberellic acid solution (GA₃) on growth, yield and yield enhancing characters of tomato

Treatmen t	No. of fruit cluster/pl ant	No. of fruit /clust er	No. of fruit plan t	Fruit diamet er	Yield (t/ ha
F ₀ G ₀	3.07 f	2.60 h	10.3 3 g	4.21 f	34.00 h
F ₀ G ₁	3.60d ef	3.53 fg	11.0 0 fg	4.76 de	38.00 ef
F ₀ G ₂	3.27 f	3.07 gh	10.6 7 g	4.21 f	35.67 gh
F ₁ G ₀	3.40 ef	3.20 g	12.0 0 e-	4.30 f	37.00 fg
F ₁ G ₁	4.20c de	3.93 d-f	13.0 0 d-	5.68 b	39.00 d-f
F ₁ G ₂	4.33 cd	3.60 e-g	15.0 0 cd	5.01 d	40.33 cd
F ₂ G ₀	3.80 def	43.13 c-e	11.6 7 fg	5.19 cd	38.00 ef
F ₂ G ₁	6.40 a	5.51 a	20.0 0 a	6.50 a	44.00 a
F ₂ G ₂	53.33 b	4.53 bc	18.0 0 ab	5.75 b	42.00 a-c
F ₃ G ₀	4.20 c-e	3.80 d-f	14.0 0 de	4.56 ef	39.67 de
F ₃ G ₁	5.67 ab	5.00 ab	18.6 7 ab	5.93 b	43.00 ab
F ₃ G ₂	4.80 bc	4.38 cd	17.0 0 bc	5.54 bc	41.00 b-d
Levels of significance	0.01	0.01	0.01	0.01	0.01
CV(%)	8.68	6.59	6.15	3.62	2.52

In a column holding similar letter(s) do not distinguish and dissimilar letter (s) distinguish significantly as per 5% and 1% level of probability.

Here, F₀=control,

G₀ = 0 ppm,

F₁=200 kg N/ha+100 kg P/ha+160kg K/ha

G₁ = 50 ppm,

F₂= 225 kg N/ha+125 kg P/ha+180 kg K/ha

F₃=250 kg N/ha+150 kg P/ha+200 kg K/ha

G₂ = 70 ppm.

CONCLUSION

An investigation was laid at the farm of horticultural in the Department of Crop Science and Technology of the Rajshahi University, Rajshahi from October 2018 to March 2019 to investigate the effect of different levels of mixed fertilizer (NPK) and different concentrations of GA₃ on the growth and yield of tomato. Four levels of mixed fertilizer (NPK) namely, F₀ = control, F₁ = 200 kg N/ha + 100 kg P/ha + 160 kg K/ha, F₂ = 225 kg N/ha + 125 kg P/ha + 180 kg K/ha and F₃ = 250 kg N/ha + 150 kg P/ha + 180 kg K/ha and three doses of GA₃ solution, namely G₀ = control, G₁ = 50 and G₂ = 70 ppm, respectively were taken out as per experimental treatment in the study. The trial was assigned in Randomized Complete Block Design (RCBD) with three replications. The unit plot size was 2 m x 1.8 m. Data on growth and yield enhancing parameters were recorded and the assembled data were statistically analyzed to evaluate the treatment effects. The analyzed mean differences were compared by least significant different (LSD) test and DMRT. Different levels of mixed fertilizer (NPK) and GA₃ positively influenced on most of the parameters studied.

The results achieved from the study simplified to stretch out the following conclusions. Mixed fertilizer (NPK) had a significant role on the growth, yield and yield contributing characters of tomato. It showed better performance with the level of 225 kg N/ha + 125 kg P/ha + 180 kg K/ha. in favor of the growth, yield and yield attributes of tomato. The better growth and yield of tomato were recorded owing to the application of 50 ppm of GA₃ solution. The combination of this investigation, namely 225 kg N/ha + 125 kg P/ha + 180 kg K/ha and 50 ppm GA₃ was found suitable in terms of all the parameters studied. Therefore, it might be played a good role in the increase production of quality tomato which might help augment in economic development of the country. Additional investigation might be accomplished to varify in different agro-ecological zones before more conformation and precision of the results.

Conflict of Interest

The author declares that there is no conflict of interest.

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