Journal of Tropical Crop Science Vol. 7 No. 3, October 2020
www.j-tropical-crops.com

Plant Growth and Tuber Yield of Several Exotic Potato Genotypes

M. T. Islam, M. M. Hossain*, M.A. Rahim, M.A.R. Rana and M. M. Rahman

Department of Horticulture, Bangladesh Agricultural University, Mymensingh 2202, Bangladesh

*Corresponding author; email: mokter.agr@bau.edu.bd

Abstract

Potato stolon and tuber number are the most important determinants of yield and these traits are associated with planting time and genotype. This study was conducted to evaluate plant growth, tuber yield contributing traits and tuber yield of potato genotypes in two planting dates. The experiment was done in randomized complete block design with three replications. Results showed that plant growth and traits that contribute to tuber yield of potato were significantly influenced by planting dates and genotypes. Stolon and tuber number as well as tuber weight were periodically investigated. It was observed that the performance of those traits were always higher in 23rd November planting. Different genotypes performed differently on all the studied parameters. Among the genotypes tested, G1 (AC 10069) produced the highest number of stolons, tubers, tuber weight, length and yield of tuber as compared to the check variety. It was observed that 23rd November planted G1 (AC 10069) gave the highest tuber yield (17.79 t.ha-1) which was statistically similar with G3 (AC 10110) (17.00 t.ha-1) when compared to the check variety. It can be concluded that planting time as well as genotype are the critical factors that determine potato yield.

Keywords: stolon, tuber, dry matter content, growth, exotic potato genotypes

Introduction

Potato (*Solanum tuberosum* L.) is one of the most important food crops in the world. It is used as a staple food in many countries of the world, but in Bangladesh it is mainly used as a vegetable. Potato is a very nutritious tuber vegetable. It is a rich source of starch, vitamin C and B and minerals. It contains about 20.6 % carbohydrates, 2.1% protein, 0.3 % fat, 1.1 % crude fiber and 0.9 % ash. It also contains a good amount of essential amino acids like leucine, tryptopan and isoleucine (Khurana & Naik, 2003). It is the most important non-cereal food crop and fourth in terms of total global food production after maize, wheat and rice (Chakraborty et al., 2000).

Potato varieties are highly heterogeneous and usually a vegetative propagated crop. It can be grown in all types of soil except saline and alkaline soils. Loamy soil, sandy loamy soil and organic matter enriched soil are the most suitable for the cultivation of potato. The potato plant is herbaceous annual, normally propagated by planting pieces of tubers that bear two or three eyes.

Although it contributes a major portion of Bangladesh food, its yield is very low as compared to other potato growing countries of the world such as Netherlands (41.99 t.ha-1), USA (48.64 t/ha), UK (38.81 t.ha-1) and India (20.50 t.ha-1) (FAO, 2016). Bangladesh produces 9474098 tons of potato from 475488 hectares of land with the yield rate of 19.93 t/ha (BBS, 2016). The main reasons for the low yield includes the use of lower-yielding varieties, poor quality seed tubers and inefficient management practices. The average yield of potato in Bangladesh could be increased through the introduction of high yielding exotic varieties or cultivation of varieties that are high yielders with better quality and are resistant to insects and diseases.

Potato has a great demand throughout the year, but its production is concentrated during the month of January to March in Bangladesh. As a lean period of vegetable potato plays a vital role in Bangladesh. There are about 27 local varieties of potatoes cultivated in different parts of Bangladesh. In the last few decades, several dozens of high yielding varieties (HYV) of potato were brought to Bangladesh and trialed experimentally under local conditions before being recommended for general cultivation (Islam et al., 2003).

Most of the potato varieties grown in Bangladesh are white-fleshed. Antioxidant rich colored potato can play a key role in potato production as well as to

combat hidden hunger in Bangladesh. On considering this point, Bangladesh Agricultural University Germplasm Centre (BAU-GPC) has collected several colored potato germplasms and multiplying them for adaptability and yield performance trials at the local climatic condition. Planting dates influence stolon development and tuber formation in potato. Therefore, it is necessarily important to find out a suitable planting date for better plant growth and higher tuber yield of potato. However, a good number of studies has already been done on planting dates of potato at home and abroad (White et al., 1983; Ahmed et al., 2015; Jamro et al., 2015), but very limited studies have been done on planting dates and tuber formation of colored potato in Bangladesh.

Therefore, this study was done to evaluate the growth and tuber yield performance of exotic colored potatoes at Bangladesh Agricultural University environment condition to determine optimum planting time of those colored potato genotypes.

Materials and Methods

Experimental Site

This study was carried out at the Horticulture Farm, Bangladesh Agricultural University, Mymensingh from November-2014 to February-2015. The soil of the experimental plot was silty-loam in texture belongs to the Old Brahmaputra Flood Plain of Agro Ecological Zone. The land was medium high, well-drained, fertile and slightly acidic with pH range of 5.5 to 6.8. During the study period, the maximum and minimum temperature ranges were 22.9-31.9 ºC and 19.6-10.6 ºC, respectively (Figure 1). No rainfall was recorded during December-2014 to January-2015 while average sunshine was 64.6 hr -231.5 hr and relative humidity remained 66.4%-88.9% (Figure 1).

Planting Materials

Colored potato (both skin and flesh) genotypes were collected from University of Wisconsin-Madison, United States of America and used as planting materials for this study. The six exotic colored potato genotypes were G_1: AC 10063, G_2: AC 10069, G_3: AC 10076, G_4: AC 10081, G_5: AC 10110, G_6: AC 10123. In addition to these genotypes, two high-yielding varieties such as “Cardinal” and “Diamant” were used as the check variety (G_7 and G_8) for this study.

Treatment and Experimental Design

The two-factor experiment consisted of two planting dates, 7th and 23rd November-2014 (Factor A). Eight potato genotypes (Factor B) were planted each date. The study was done following a randomized complete block design with three replications. The total number of plots was 48 (2×8=24×3). The spacing between blocks and plots were 1.0 m and 0.5 m, respectively. The size of unit plot was 3m×2.4m where 40 plants were accommodated with a spacing of 60cm×30cm.

Land Preparation and Planting of Potato Tuber

The experimental field was thoroughly prepared by ploughing and cross ploughing with a power tiller followed by laddering to obtain a good tilth. Weeds

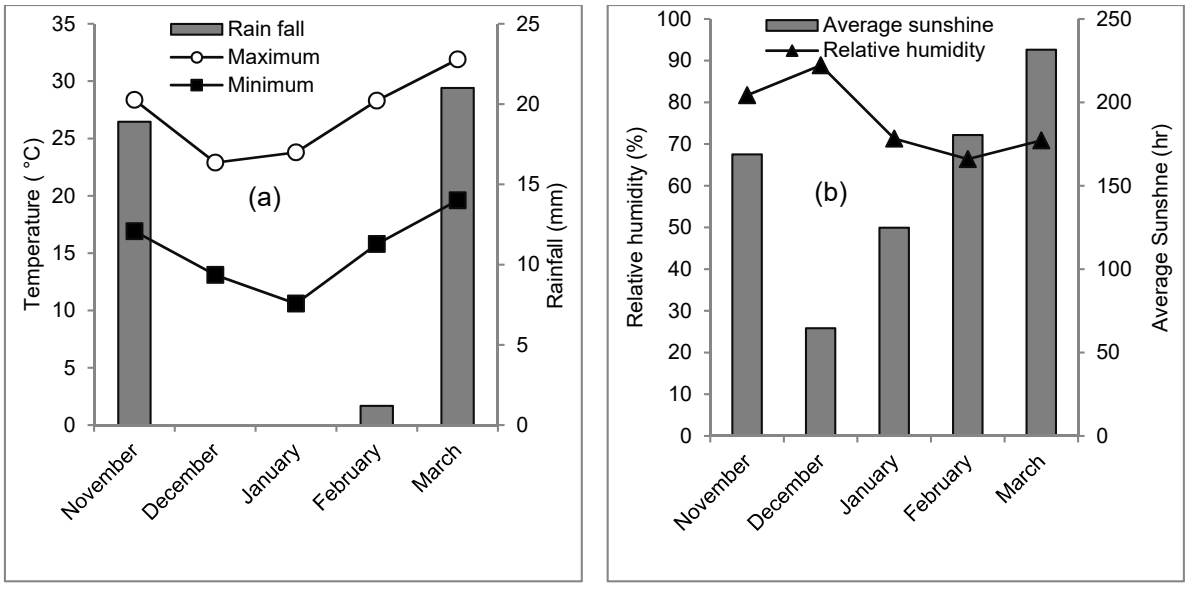

Figure 1. Temperatures (a) and relative humidity (b) of the experimental location during November 2014 to March 2015

and others stubbles were removed and the plots were prepared after applying the basal doses of manures and fertilizers. Soil was treated with insecticides (Furadan 5G, a.i. 5 g carbofuran at 10 kg per ha) at the time of final land preparation to protect young plants from the attack of cutworm and mole cricket. The entire cow manures (20 t per ha) was applied during final land preparation. From the recommended fertilizer doses of Urea, TSP and MoP (276, 185 and 322 kg per ha, respectively) half of urea and full amount of TSP and MoP were applied in plots and mixed properly with soil before planting of tuber. The remaining urea was applied after 35 days of planting as side dressing and mixed well with soil followed by flood irrigation. Well-sprouted seed tubers (41mm×55mm) were prepared for planting. Tubers were cut into pieces keeping desired eyes about 24 hours before planting.

The seed tubers were planted at spacing of 60cm×30 cm maintaining a depth of 5 cm in the experimental plots according to planting dates. The soil along the rows of seed tubers were ridged up immediately after planting.

Cultural Operations, Harvesting of Tuber and Data Collection

Weeding was done as and when necessary to keep the plots free from weeds. The soil was mulched by breaking the upper crust of the soil for easy aeration and to conserve soil moisture as and when needed. Earthing up, i.e. uplift of soil at the base of plants, was done twice, and three irrigations were provided throughout the growing period. Dithane M-45 was applied at 2 g per L at 10 days interval as a preventive measure against late blight (*Phytophthora infestans*) of potato. Five sample plants were harvested periodically at 35, 50, 65 and 80 days after planting (DAP) from each plot for recording of data on number of stolons, tubers and fresh weight of tubers. A total of 20 plants per plot were used for periodical data recording and the remaining 20 plants were reserved for final harvest. From those plants, plant height, number of leaves, tuber length, diameter, dry matter content and total yield of tuber were recorded at final harvest.

For determination of dry matter content in potato tuber, 50 g of potato was oven dried at 70°C for 72 hrs until the weight become constant. Then percentage of dry matter content was calculated by substracting the moisture content from 100%.

Statistical Analysis

Collected data were statistically analyzed using MSTAT C statistical package program. The means for all the treatments were calculated and the analyses of variances (ANOVA) were performed by *F* variance test. The significance of the difference between pairs of treatment means was evaluated by least significant difference (LSD) test at 5% and 1% level of probability (Gomez and Gomez, 1984).

Results

Effects of Planting Dates on Growth and Yield of Colored Potato

The above ground growth of plants (plant height, number of leaves), the number of stolons, tuber number per hill, tuber length, diameter, dry matter content and tuber yield significantly affected by planting dates. It was found that tuber planting in 23rd November significantly increased all those studied parameters. Highest plant height (83.93 cm) and number of leaves per hill (85.79) were recorded from 23rd planting (Table 1). The number of stolons, number of tubers, tuber weight per hill was investigated periodically and all those indicators increased gradually as time progressed. It was found that these yield contributing traits performed significantly superior in 23rd November planting as compared to 7th November planting at every stage of growth (Figure 2a, 3a, and 4a). Similarly, tuber length (8.24 cm), diameter (4.96 cm), dry matter content (23.18%) and tuber yield per unit area (14.90 t per ha) were also recorded higher from 23rd November planting (Table 1).

Effects of Genotypes on Growth and Yield of Colored Potato

Plant growth and tuber yield contributing characters of colored potato significantly influenced by potato genotypes. The results relating to the plant height indicated that there was significant variation among the potato genotypes. It was observed that the tallest plant (102.63 cm) was produced from G3 (AC 10110) followed by G6 (AC 10123) (93.46 cm), G1 (AC 10069) (83.25 cm) while the shortest plant (53.35 cm) was in accession G4 (AC 10081) (Table 2). The number of leaves per hill varied significantly among the potato genotypes. The number of leaves per hill ranged from 64.92 to 108.42 among the genotypes. The maximum number of leaves per hill (108.42) was produced by G3 (AC 10110) followed by G5 (AC 10063) (87.67), G7 (“Cardinal”) (76.50) and G8 (“Diamant”) (72.92). The minimum number of leaves per hill was found from G4 (AC 10081) (64.92) (Table 2).

Number of stolons per hill varied significantly among

Table 1. Effects of planting dates on yield contributing traits and yield of potato

Planting dates	Plant height (cm)	No. of leaves per hill	Tuber length (cm)	Tuber diameter (cm)	Dry matter (%)	Yield (t.ha^{-1})
7th November	75.84	78.29	7.40	4.62	21.12	10.97
23th November	83.93	85.79	8.24	4.96	23.18	14.90
$LSD_{0.05}$	0.81	0.94	0.09	0.07	0.39	0.18
$LSD_{0.01}$	1.09	1.26	0.12	0.10	0.54	0.24
Significance level	**	**	**	**	**	**

** indicates significant at 1% level of probability

Table 2. Effects of genotypes on yield contributing traits and yield of potato

Potato genotypes	Plant height (cm)	No. of leaves per hill	Tuber length (cm)	Tuber diameter (cm)	Dry matter (%)	Yield (t.ha^{-1})
G1 (AC 10069)	83.25	83.08	9.04	3.03	21.53	15.93
G2 (AC 10076)	74.92	80.58	7.27	5.02	21.10	9.87
G3 (AC 10110)	102.63	108.42	6.70	5.56	22.17	12.75
G4 (AC 10081)	53.38	64.92	7.11	4.93	18.56	11.71
G5 (AC 10063)	69.00	87.67	7.62	5.20	23.63	12.03
G6 (AC 10123)	93.46	82.25	7.48	4.91	23.83	14.68
G7 (“Cardinal”)	79.88	76.50	8.52	4.75	24.67	14.12
G8 (“Diamant”)	82.55	72.92	8.83	4.89	21.63	12.38
$LSD_{0.05}$	1.63	1.87	0.18	0.14	0.80	0.36
$LSD_{0.01}$	2.19	2.52	0.24	0.19	1.07	0.48
Significance level	**	**	**	**	**	**

** indicates significant at 1% level of probability

the potato genotypes. The number of stolons per hill was increased gradually for each genotype (Figure 2B). At 80 DAP, the number of stolons per hill was highest in G1 (AC 10069) (16.96) followed by G6 (AC 10123) and G7 (“Cardinal”) (12.79). While the lowest number of stolons per hill was observed in G5 (AC 10063) (10.25) preceded by G8 (“Diamant”) (11.96) (Figure 2B). Tuber number per hill varied significantly among the genotypes. Result shows that number of tuber per hill was increased gradually over time. At 80 DAP, number of tubers per hill was found to be the highest in G1 (AC 10069) (14.25) followed by G3 (AC 10110) (12.33) (Figure 3B). On the other hand, the lowest number of tubers per hill was observed in G7 (“Cardinal”) (9.63) preceded by G8 (“Diamant”) (10.25).

There were significant variations among the genotypes on length, diameter of tuber, weight of tuber per hill, dry matter contents and yield per hectare. The maximum length and minimum diameter of tuber was found in G1 (AC 10069) (9.04 cm, 3.03 cm, respectively). While the minimum tuber length and maximum diameter was obtained from G3 (AC 10110) (6.70 cm, 5.56 cm, respectively) (Table 2).

Weight of tubers per hill was increased gradually during the entire growth period. At 80 DAT, the highest weight of tuber per hill was recorded in G1 (AC 10069) (357.04 gm) followed by G6 (AC 10123) (340.58 gm) and the lowest weight was found from G2 (AC 10076) (234.92 gm) (Figure 4b). In respect of dry matter content of potato tuber, the highest dry matter content was found in G7 (“Cardinal”) (24.67%) followed by G6 (AC 10123) (23.83%), G5 (AC 10063) (23.63%) and G4 (AC 10081) produced the lowest dry matter content (18.56%) (Table 2). Different potato genotypes performed differently on tuber yield per hectare. The highest tuber yield was produced by G1 (AC 10069) (15.93 t.ha-^{1}) followed by G6 (AC 10123) (14.68 t.ha-^{1}) and G7 (“Cardinal”), while G2 (AC 10076) produced the lowest yield of tubers (9.87 t.ha-^{1}; Table 2).

Combined Effects of Planting Dates and Genotypes on Growth and Yield of Colored Potato

The combined effects of genotypes and planting dates significantly influenced on growth, yield contributing characters, and yield of coloured potato. The maximum plant height (107.8 cm) and number

of leaves (109.92) observed when G3 (AC 10110) planted in 23rd November. The lowest plant height (50.42 cm) and number of leaves (60.42) recorded when G4 (AC 10081) planted in 7th November (Table 3). At 80 DAP, the maximum number of stolons per hill (18.33) and tubers per hill (15.08) was counted when G1 (AC 10069) planted in 23rd November and the minimum number of stolons per hill (9.08) was recorded from 7th November planting of G5 (AC 10063) but at the same planting time produced the smallest amount of tubers per hill (9.17) from G7 ("Cardinal") (Table 4).

Both of the check varieties (G7 and G8) produced the longest tuber length (9.58 cm) followed by G1 (AC 10069) (9.20 cm) when planted in 23rd November and 7th November planted G3 (AC 10110) produced the shortest tuber length (6.52 cm) (Table 3). Tuber diameter was larger from 23rd November planted G3 (AC 10110) (5.81 cm) and G5 (AC 10063) (5.77 cm) and smaller tuber diameter obtained from 7th November planted G1 (AC 10069) (3.02 cm) (Table 3). The highest dry matter contents obtained from 23rd November planted G7 ("Cardinal") (26.00%) which was statistically similar with G6 (AC 10123) (25.73%) and G5 (AC 10063) (24.93%) while 7th November planted G4 (AC 10081) gave the lowest dry matter content (18.45%) (Table 3). In terms of tuber yield, 23rd November planted G1 (AC 10069) produced the maximum yield (17.97 t per ha followed by same time planted G3 (AC 10110) (17.00 t per ha) and the minimum yield (8.06 t per ha) obtained from 7th November planted G2 (AC 10076) (Table 3).

Discussion

Potato tuber yield is associated with radiation use efficiency and the ability of leaves to convert of photo synthetically active radiation into carbohydrate and storage capacity of tuber. In this study growth and tuber yield performances of exotic colored potato genotypes were evaluated in to two planting dates (7th November and 23rd November). It was observed that plant growth, yield contributing traits and yield of potato genotypes were higher in 23rd November planting.

Potato tuber yield is closely associated with number of stolons produced and number of tubers formed during the growth of plants. Both of these traits depend on environmental and soil factors of the growing location. Gao et al. (2014) noticed that potato tuber initiation and growth are the important processes

Table 3. Combined effects of planting dates and genotypes on yield contributing traits and yield of potato

	Treatment combinations	Plant height (cm)	No. of leaves per hill	Tuber length (cm)	Tuber diameter (cm)	Dry matter (%)	Yield (t.ha^{-1})
7th November	G1 (AC10069)	76.08	79.58	8.87	3.02	21.33	13.88
	G2 (AC10076)	74.75	78.08	7.20	4.87	20.67	8.06
	G3 (AC10110)	97.42	106.92	6.52	5.31	20.00	8.49
	G4 (AC10081)	50.42	60.42	6.95	4.83	18.45	10.41
	G5 (AC10063)	65.92	81.67	6.76	4.62	22.33	10.06
	G6 (AC10123)	91.00	78.25	7.35	4.78	21.93	13.85
	G7 ("Cardinal")	74.67	72.00	7.46	4.65	23.33	12.56
	G8 ("Diamant")	76.42	69.42	8.08	4.84	20.93	10.41
23th November	G1 (AC10069)	90.42	86.58	9.20	3.04	21.93	17.97
	G2 (AC10076)	75.08	83.08	7.37	5.17	21.53	11.68
	G3 (AC10110)	107.8	109.92	6.88	5.81	24.33	17.00
	G4 (AC10081)	56.33	69.42	7.26	5.03	18.67	13.00
	G5 (AC10063)	72.08	93.67	8.48	5.77	24.93	13.99
	G6 (AC10123)	95.92	86.25	7.60	5.03	25.73	15.50
	G7 ("Cardinal")	85.08	81.00	9.58	4.85	26.00	15.68
	G8 ("Diamant")	88.67	76.42	9.58	4.94	22.33	14.35
$LSD_{0.05}$		2.29	2.65	0.25	0.20	1.13	0.44
$LSD_{0.01}$		3.09	3.57	0.34	0.28	1.52	0.68
Significance level		**	**	**	**	**	**

** indicates significant at 1% level of probability

Table 4. Combined effects of planting dates and genotypes on number of stolons and tubers per hill at different days after planting

Treatment combination		No. of stolons per hill (days after planting) days after planting				No. tubers/hill at different days after planting			
		35	50	65	80	35	50	62	80
7th November	G1 (AC10069)	6.58	11.00	12.08	15.58	6.58	8.67	11.00	13.42
	G2 (AC10076)	4.50	6.83	8.83	11.67	6.32	6.92	8.25	10.75
	G3 (AC10110)	6.08	8.33	9.00	11.83	5.00	6.67	7.42	11.58
	G4 (AC10081)	5.75	7.33	7.67	10.17	5.31	5.08	6.75	10.17
	G5 (AC10063)	4.33	5.83	6.33	9.08	5.04	6.33	7.25	10.12
	G6 (AC10123)	5.00	7.67	9.42	11.00	5.21	5.58	6.17	11.08
	G7 (“Cardinal”)	5.92	6.67	7.17	10.00	5.01	4.00	5.00	9.17
	G8 (“Diamant”)	5.75	7.33	7.83	10.08	4.47	4.92	6.00	9.75
23th November	G1 (AC10069)	10.58	15.00	17.58	18.33	7.08	12.08	14.33	15.08
	G2 (AC10076)	8.00	9.42	11.89	12.42	6.92	7.78	9.17	11.08
	G3 (AC10110)	6.58	9.83	12.33	13.58	5.25	8.33	9.67	13.08
	G4 (AC10081)	6.83	8.17	11.50	13.58	5.92	8.00	9.42	12.08
	G5 (AC10063)	6.25	7.58	10.75	11.42	5.33	7.17	9.17	10.58
	G6 (AC10123)	7.17	8.92	11.58	14.58	6.35	7.92	9.67	11.25
	G7 (“Cardinal”)	6.50	8.58	12.08	15.58	5.17	6.75	8.00	10.08
	G8 (“Diamant”)	6.92	9.00	13.02	13.83	4.67	8.33	9.58	10.75
$LSD_{0.05}$		0.68	0.71	0.62	1.40	0.38	0.64	0.930	0.24
$LSD_{0.01}$		0.91	0.95	0.84	1.89	0.52	0.86	1.252	0.32
Significance level		**	**	**	**	ns	**	**	**

** indicates significant at 1% level of probability, NS= non-significant difference

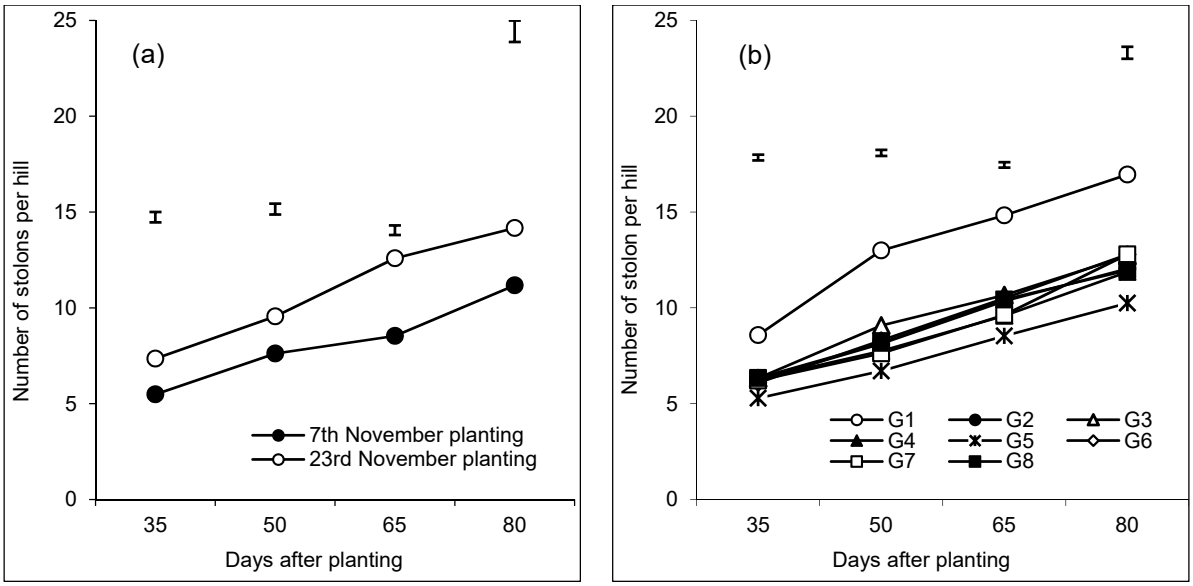

Figure 2. Effect of planting dates (a) and genotypes (b) on number of stolons of colored potato genotypes. Vertical bars indicate LSD at 1% level of probability.

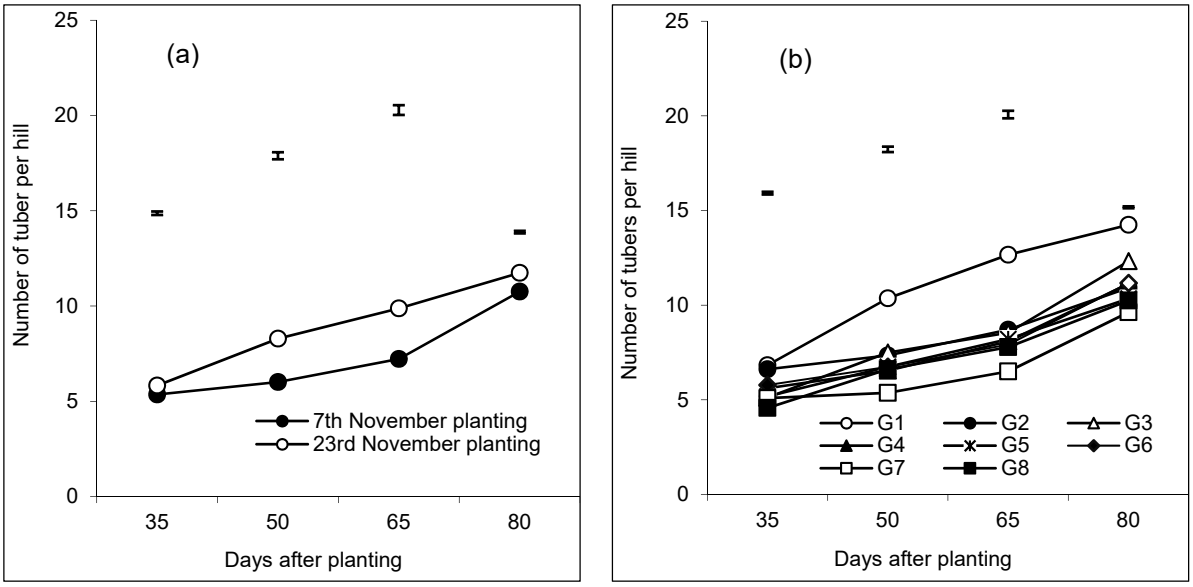

Figure 3. Effect of planting dates (a) and genotypes (b) on number of tubers of colored potato genotypes. Vertical bars indicate LSD at 1% level of probability.

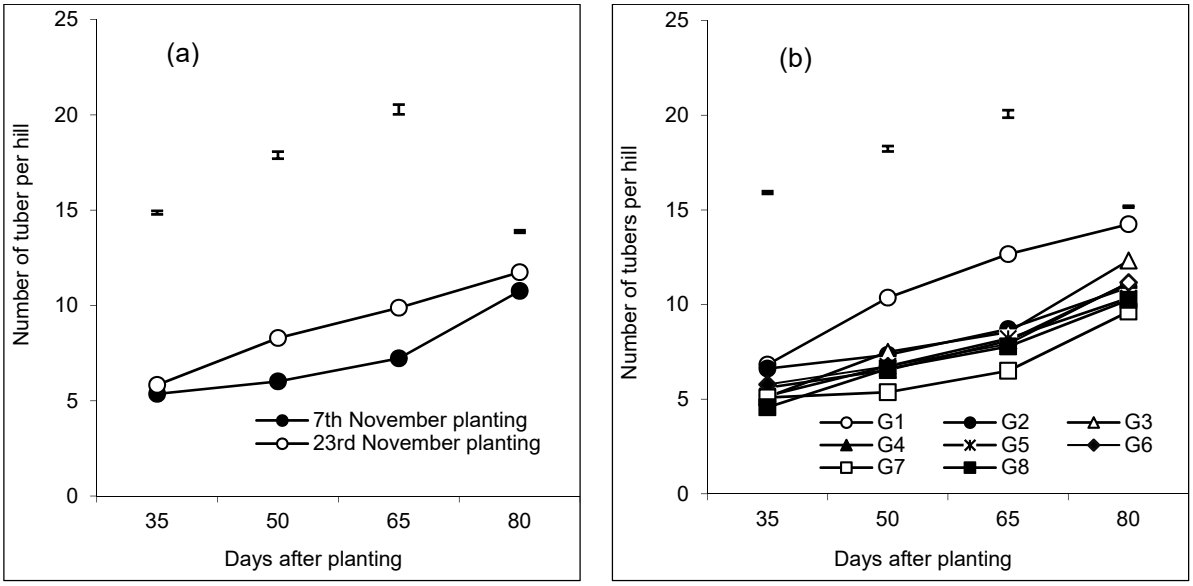

Figure 4. Effect of planting dates (a) and genotypes (b) on weight of tuber of colored potato genotypes. Vertical bars indicate LSD at 1% level of probability.

which determined the final tuber yield. In this study we observed a higher stolon number as well as tuber produced when potato seed tubers were planted in 23rd November. Tuber planted in 23rd November availed favourable environmental conditions (Fig. 1a and 1b) especially longer sunny days which presumably enhanced meristematic cell division, cell elongation resulting in the maximum plant height and number of leaves. Hossain et al. (1980) and Siddique et al. (1984) reported the similar results from their experiments on performance of the variety “Diamant” under similar Bangladesh conditions. Variation in plant height in this finding compared to other findings may be due to difference in agro-ecological condition and soils of the experimental site.

Tuber planting on 23rd November produced higher number of stolons and tubers per hill than planting on 7th November. This happened probably due to favourable conditions for development of maximum number of stolon at the belowground part of plant. Furthermore, repeated earthing up kept the surrounding soil of the stem dry and friable even after irrigation which may help in the easy growth and development of tubers.

Average length and diameter of tuber varies significantly due to planting dates. It was observed that 23rd November planting was the best for attaining higher tuber length and diameter while early planting result reduction in tuber length and diameter.

Percent dry matter content was significantly influenced by planting dates. The maximum percent of dry matter content (23.18%) was recorded from 23rd November planting where the minimum dry matter content (21.12%) was recorded from 7th November planting. Dry matter content varies significantly among the genotypes. It was found that maximum dry matter content (23.63%) produced by G5 (AC 10063 which was higher than the promising variety Provento (20.60%) (Hossain et al., 2003). Mahamud et al. (2015) noticed that exotic genotypes contained higher dry matter than that of promising variety "Cardinal" and "Diamant". Previous studies reported that differences in dry matter content among the genotypes might be due to variation in genetic factors as well as climatic conditions of the locality and crop growing techniques (Kumar et al., 2003; Sood et al., 2008; Abong et al., 2010). Higher tuber yield per hill as well as per hectare was achieved from 23rd November planting. This is may be due to favourable condition prevailing during growth and development of tubers.

The yield of tubers per hill was found to be the highest (357.05 g) from AC 10069 and the lowest (234.92 g) yield of tubers per hill was observed from AC 10076. Rashid and Ahmad (1974) reported that increasing trend of yield per hill with planting of increased size of seed tuber. Anonymous (1986), Akhter et al. (1991) reported that variety "Diamant" and "Cardinal" gave the yield of 410 g per plant and 430 g per plant in first generation, respectively whereas in the present experiment the variety "Diamant" gave the yield of 317.75 g per hill and "Cardinal" gave the yield of 332.29 g per hill. Hence, G1 (AC 10069) considered as higher yielder than the check variety "Diamant" and "Cardinal" in respect of yield of tubers per hill. The total yield of tubers per hectare was greatly influenced by the potato accession. The yield of tuber was found to vary from 9.87 to 15.93 $t.ha^{-1}$. The highest tuber yield was found from G1 (AC 10069). The possible reason of such result was that the AC 10069 had more number of stems per hill with the higher number of germination percentage which is contributed to the production of increased number of stolons thus ultimately increased the tuber yield. It was reported by Ahmad (1980), Anonymous (1980), Hossain et al. (2003) that the variety "Diamant" gave the yield of 23.43, 24.79, and 22.0 $t.ha^{-1}$, respectively. But in the present study, it was observed that the variety "Diamant" and "Cardinal" gave the yield 12.38 and 14.12 t per ha, respectively.

Conclusion

Formation of stolons as well as tubers of potato are the key determinants of potato yield. Both of these functions are dependent on duration of sunlight, temperature and relative humidity of potato growing areas. However, in this study eight potato genotypes including two check varieties were tested between two planting dates. From the results of this study it was noticed that 23rd November was the suitable planting for higher stolon and tuber formation as well as other yield contributing characters of potato as compared to 7th November planting. Among the genotypes tested, G1 (AC10069) performed superior in respect of most of the parameters studied as compared to the check varieties.

References

Abong, G.O., Okoth, M.W., Imungi, J.K., and Kabira, J.N. (2010). Evaluation of selected Kenyan potato cultivars for processing into potato crisps. *Agriculture and Biology Journal of North America* **1**, 886-893.

Ahmad, A. (1980). Performance of potato in their 1st and 2nd generations *In* "Proceedings of 3rd Workshop on Potato Research" pp. 22-23.

Ahmed, B., Sultana, M., Chowdhury, M., Akhter, S., and Alam, M. (2015). Growth and yield performance of potato varieties under different planting dates. *Bangladesh Agronomy Journal* **20,** 25-29. https://doi.org/10.3329/baj.v20i1.34878.

Akhter, S., Quasem, A., and Rashid, M. M., (1991). Studies on the bulking behavior of some exotic potato varieties *In* "Proceeding of First National Workshops on Tuber Crops" pp. 127-130.

Anonymous. (1980). "A Study on the Varietal Performance of Potato in Farmer's Field". Annual Report, BARI, Joydebpur, Dhaka, p. 23. Bangladesh.

Anonymous. (1986). "Study on the Comparative Performance of Some Exotic Varieties of Potato" Gazipur, pp. 29-30. Bangladesh. Annual Report, PRC, BARI, Joydebpur, Gazipur, Bangladesh.

BBS. (2016). "Monthly Statistical Bulletin". Bangladesh Bauro of Statistics, Statistics Division, Ministry of Planning, Government of the People's Republic of Bangladesh.

Chakraborty, S., Chakraborty, N., and Datta, A. (2000). Increased nutritive value of transgenic potato by expressing a non-allergenic seed albumin gene from Amaranthus hypochondrioccus. *Proceedings of the National Academy of Science* **97,** 3724-3729.

FAO. (2016). "Production Yearbook". Food and Agriculture Organization of the United Nations, Rome, Italy.

Gao, Y., Jia, L., Hu, B., Alva, A., and Fan, M. (2014). Potato stolon and tuber growth influenced by nitrogen form. *Plant Production Science* **17,** 138-143. https://doi.org/10.1626/pps.17.138.

Gomez, K.A., and Gomez, A.A. (1984). "Statistical Procedure for Agricultural Research (2nd edition)". Willey International Science Publication, John Willey and Sons, New York.

Hossain, M. A. E., Khan, A. I., Rahman, M., and Rahman, A. (1980). Performance of potato varieties in their 1st generation *In* "Proceedings of 3rd Workshop on Potato Research" pp. 13-15. BARI, Joydebpur, Dhaka.

Hossain, M. M., Akhter, M. I., Sattar, M. A., Rashid, M. H., and Ali, M. S. (2003). "Maintenance of Promising Variety/Genotype". Annual Research Reports on Tubers Crop Improvement pp. 13-15. TCRC, BARI, Joydebpur, Gazipur.

Islam, S., Miah, S., Ahmed, W., Chowdhury, A. M., Rahman, S. M. M., Siddiqui, K., Kabir, and S. M. H. (2003). Banglapedia, National Encyclopedia of Bangladesh. *Asiatic Society of Bangladesh* **8**,149-153.

Jamro, M.M.R., Tunio, S.D., Buriro, U.A., and Chachar, Q. D. (2015). Effect of planting dates on growth and yield of true potato seed (TPS) in nursery raising approach. *Journal of Basic and Applied Science*, **11,** 318-322.

Khurana, P.S.M. and Naik, P.S. (2003). The potato: an overview *In* "Potato Production and Utilization in Subtropics" pp. 1-14. Mehta Publication, New Delhi, India.

Kumar, D., Ezekiel, R., and Khurana, S.M.P. (2003). Effect of location, seasons and cultivar on the processing quality of potatoes. *Journal of Indian Potato Association* **30,** 247-251.

Mahamud, M. A., Chowdhury, M. A. H., Rahim, M. A., and Sheel, P.R. (2015). Performance of some potato accessions of USA and Bangladesh in relation to dry matter yield and biochemical constituent. *Journal of Bangladesh Agricultural University* **13,** 215-220.

Siddique, M.A., Rahim, M. A., and Farooque, A. M. (1984). Influence of imported and locally produced seeds and time of planting on the yield of four potato cultivars. *Bangladesh Horticulture* **12,** 33-37.

Sood, D.R., Kalim, S., and Shilpa (2008). Biochemical evaluation of potato tubers and peels. *The Indian Journal of Nutrition and Dietetics* **45,** 410-421.

White, R. P., and Sanderson, J. B. (1983). Effect of planting date, nitrogen rate, and plant spacing on potatoes grown for processing in Prince Edward Island. *American Potato Journal* **60**, 115-126. https://doi.org/10.1007/BF02853800