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PERFORMANCE OF VARIETY AND PLANTING MATERIALS ON THE YIELD AND YIELD ATTRIBUTING CHARACTERS OF SWEET POTATO

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ABTRACT

The present experiment was conducted at the Horticulture Farm, Bangladesh Agricultural University, Mymensingh during the period from December 2001 to May 2002 to study on the performance of variety and planting materials on the yield of sweet potato. There were five sweet potato varieties viz.,Tripti, Kamalasunduri, Daulatpuri, BARI sweet potato-4 and BARI sweet potato-5 and three portions of vine cutting used as planting materials, viz., tip, middle and basal portion. The experiment was laid out in RCBD with three replications. Growth habit, yield contributing characters and yield of sweet potato were found to vary significantly from one variety to other. The highest yield of tuberous roots was found in the variety Tripti (33.90 t/ha) and the lowest yield was obtained from the variety Daulatpuri (21.60 t/ha).Vine parts used had significant influence on growth and yield of sweet potato. Planting of tip cuttings gave the highest yield (31.58 t/ha). The yield of tuberous roots (26.85 t/ha) were recorded as the lowest from basal cuttings. The combination of different varieties and planting materials exhibited significant variation in some yield components and yield of sweet potato. The combination of Tripti with tip cuttings produced the highest yield of tuberous roots (36.07 t/ha).

Key word: Planting materials, variety, performance, yield and sweet potato

INTRODUCTION

Sweet potato (*Ipomoea batatas* Poir) is one of the major starch rich root crops of the tropics and sub-tropics belonging to the family Convolvulaceae. This crop is very popular among the poor people of Bangladesh because of its low price. The tubers of this crop are edible and are consumed as boiled, baked, roasted or fried forms (Onwueme, 1978). The young vine with tender leaves is also consumed as vegetable. Bangladesh produced 378 thousand metric tones of sweet potato in an area of 4089 thousand hectares of land showing an average yield of 9029 metric tones per hectare during the year 1999-2000 (BBS, 2001). This average yield is very low compared to that yield of Japan and Korea where per hectare yields are reported to be 22.7 and 21.0 t/ha respectively (FAO, 1999). The main reasons for such decreased quantity of sweet potato production per hectare in Bangladesh are mainly use of poor yielding varieties and sub-optimal production practices.

Since now, only five improved varieties namely, Tripti, Kamalasunduri, Daulatpuri, BARI sweet potato-4 and BARI sweet potato-5 have been developed by Bangladesh Agricultural Research Institute (BARI), Joydebpur, Gazipur (Razzaque *et al.*, 2000). These varieties are yet to be popularized among the farmers. Sweet potatoes are propagated normally by vine cuttings. The farmers in our country generally use cut pieces of vines irrespective of the position viz. basal, middle or apical part of vines. There are some reports indicating advantage of apical cutting over the use of other parts of vine in producing higher yield (Hossain and Mondal, 1994), but this is not well accepted and even not extensively practiced in sweet potato cultivation. Moreover, influence of different vine parts when used in the cultivation of different varieties were not even assessed through experimental studies. The present work was, therefore, undertaken in order to find out the suitable vine part to be used as planting material for a particular variety for maximization of yield of sweet potato especially for those released by BARI.

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MATERIALS AND METHODS

The field experiment was carried out at the Horticulture Farm of Bangladesh Agricultural University, Mymensingh during the period from December, 2001 to May, 2002 to study on the performance of variety and planting materials on the yield of sweet potato. The soil of the experimental plot was sandy-loam in texture belonging to the Old Brahmaputra Flood Plain under the Agro-Ecological Zone 9 having non calcareous dark gray flood plain soil (FAO, 1988). The land was medium high with adequate irrigation and drainage facilities. The selected plot was kept fallow during the previous season. Soil characteristics of the experimental site at a depth 0-30 cm were assessed at the Department of Soil Science, Bangladesh Agricultural University (BAU), Mymensingh. The soil characteristics were as follows: soil pH 6.37, organic carbon (%)0.61, organic matter (%)1.05, total nitrogen (%) 0.06, available phosphorus (ppm) 25.00, available sulphur (ppm) 6.00 and exchangeable K (meq/100 g soil) 0.07. The whole vines of these five varieties were collected from the Tuber Crops Research Centre (TCRC), Bangladesh Agricultural Research Institute (BARI), Joydebpur, Gazipur. Vine cuttings of sweet potato (tip, middle and basal portion) approximately 30 cm in length with at least 6-7 nodes were used. The present experiment consisted of two factors namely, varieties and vine cuttings which were as follows.

Factor A: It included five varieties of sweet potato such as: V_1: Tripti, V_2: Kamalasunduri, V_3: Daulatpuri, V_4: BARI sweet potato-4 and V_5: BARI sweet potato-5

Factor B: It comprised of 3 types of vine cutting used as planting material which are mentioned below. 1) P_1: Tip cutting, 2) P_2: Middle portion vine cutting 3) and P_3: Basal portion vine cutting. Thus, there were 3×5 = 15 treatment combinations. The two factors experiment was laid out in the Randomized Complete Block Design (RCBD) with three replications. The experimental land was first divided into three blocks each containing 15 plots. Thus, there were 45 unit plots of 2.4m × 2.4m in size. Treatments were assigned at random to 15 plots in each block. The space kept between blocks was 60 cm and between plots was 30 cm. The vine cuttings were planted in the experimental plots at a spacing of 60cm×30cm. Each plot comprised 4 rows of plants. Eight vines were planted in each row. The land was prepared properly and was fertilized with well decomposed cow dung 10 tons/ha, Urea 150 kg/ha, Triple Super Phosphate (TSP) 125 kg/ha and Murate of Potash (MP) 175 kg/ha. The entire amount of cow dung, TSP, one-fourth of urea and MP were applied in each plot during final land preparation. The applied manure and fertilizers were mixed with soil with the help of a spade. Rest part of urea and MP were side dressed after 60 days of planting. The vine cuttings were planted in the experimental plots in the afternoon of 1 December, 2001 at a spacing of 60cm×30cm (Rashid and Mannan, 1986). One third of the total length of the vine cuttings was put under the soil. Planting was followed by light irrigation by a water can. The intercultural operation like weeding, earthing up, irrigation, and Vine lifting and plant protection from pest were done whenever needed. Data were collected on different growth and physiological parameters of sweet potato. The plant of the outer two rows and the extreme ends of the middle rows were excluded from the random selection of plant to avoid the border effects. Ten plants were randomly selected from each plot to record data on the following characters: weight of tuberous roots per plant, weight of tuberous roots per plot and yield of tuberous roots per hectare, dry matter contents of tuberous roots (%), weevil infestation of the tuberous roots (%), regularity in shape of tuberous roots was determined by hedonic scale at the time of harvest (scoring was done on the basis of uniformity of shape of tuberous roots. Highest score indicated most regular shape and lowest score indicated most irregular shape of tuberous root. The range of the scale was 1-9), distribution of tuberous roots in different sizes (% by number), distribution of tuberous roots in different sizes (% by weight). The data obtained for different growth and physiological parameters were statistically analyzed to find out the significance of the difference among the treatments. The analysis was performed by F-test and the significance of the difference between pairs of treatment mean was evaluated by the Least Significant Difference (LSD) test, at 1% and 5% level of probability (Gomez and Gomez, 1984).

RESULTS AND DISCUSSION

Weight of tuberous roots per plant

Weight of tuberous roots per plant is the most important yield contributing character. There was significant variation among the varieties in respect of weight of tuberous roots per plant (Table 1). The highest weight of tuberous roots per plant (0.65 kg) was found in the variety Tripti followed by Kamalasunduri (0.61 kg), BARI sweet potato-5 (0.57 kg) and BARI sweet potato-4 (0.49 kg). The lowest (0.42 kg) weight of tuberous roots per plant was recorded in Daulatpuri.

Table 1. Main effect of variety on the yield contributing characters and yield of sweet potato

Variety	Weight of vines/plant (Kg)	Weight of tuberous roots/plant (kg)	Weight of tuberous roots/plot (kg)	Dry matter content (%)	Weevil infestation (%)	Regularity in shape of tuberous roots (score)
V_1	0.62	0.65	19.53	28.33	5.89	2.93
V_2	0.52	0.61	17.90	23.33	15.40	4.40
V_3	0.47	0.42	12.44	30.39	4.79	3.40
V_4	0.56	0.49	16.90	25.94	15.05	5.57
V_5	0.50	0.57	16.95	30.11	8.31	6.57
LSD (0.05)	0.031	0.031	0.882	1.208	1.370	0.372
LSD (0.01)	0.042	0.042	1.190	1.629	1.849	0.501

V_1 : Tripti , V_2 : Kamalasunduri , V_3 : Daulatpuri, V_4 : BARI Sweet Potato – 4 and V_5 : BARI Sweet Potato – 5

The weight of tuberous roots per plant varied significantly due to the effects of different types of vine cutting (Table 2). Out of three types of vine cuttings, the tip cutting produced the highest weight of tuberous roots per plant (0.64 kg) followed by middle cutting (0.53 kg) and basal cutting gave the lowest weight (0.47 kg).

Table 2. Main effect of vine parts on the yield contributing characters and yield of sweet potato

Vine parts	Weight of vines/plant (Kg)	Weight of tuberous roots/plant (kg)	Weight of tuberous roots/plot (kg)	Yield of tuberous roots (t/ha)	Dry matter content (%)	Weevil infestation(%)	Regularity in shape of tuberous roots (score)
P_1	0.57	0.64	18.19	31.58	28.13	8.95	5.26
P_2	0.52	0.53	16.58	28.79	28.00	10.90	4.58
P_3	0.51	0.47	15.46	26.85	26.73	9.82	3.88
LSD (0.05)	0.024	0.024	0.683	1.186	0.935	1.061	0.288
LSD (0.01)	0.032	0.032	0.922	1.600	1.262	1.432	0.388

P_1 : Tip cutting, P_2 : Middle portion vine cutting and P_3 : Basal portion vine cutting

The combined effects of tuberous roots and vine parts on the weight of tuberous roots per plant have been presented in table 3. There was significant variation among the treatment combinations. The maximum weight of tuberous roots per plant (0.70 kg) was found in the treatment combination of variety Tripti with tip cuttings (V_1 P_1), which was statistically identical to the treatment combination of same variety with middle cuttings (0.65 kg) and Kamalasunduri with tip cuttings (0.68 kg). The minimum weight of tuberous roots per plant (0.33 kg) was found with the treatment combination of the variety Daulatpuri with basal portion vine cuttings.

The combined effect between different varieties and type of cuttings was also significant. The results showed that tip cuttings produced the maximum weight of tuberous root per plant than those of other two types of cuttings as because plants raised from tip cuttings grew more vigorously. The increased assimilation of photosynthesis in plants of tip cuttings and thereafter storing in the tuberous roots resulted higher bulking of tubers. This finding agrees with the results of Chowdhury *et al.* (1986).

Weight of tuberous roots per plot and yield of tuberous roots per hectare

Yield of tuberous roots per hectare was calculated on the basis of weight of tuberous roots per plot. The yield of tuberous roots was significantly influenced by the effect of variety (Fig. 1). Variety Tripti gave the highest yield (33.90 t/ha), whereas, the lowest yield (21.60 t/ha) was obtained from Daulatpuri. The variety BARI sweet potato-4 gave the yield of 29.34 t/ha which was statistically similar to BARI sweet potato-5 (29.42 t/ha) but not to Kamalasunduri (31.08 t/ha). Siddique (1985) also observed significant variation among the different varieties of sweet potatoes in this respect. Yield of tuberous roots per hectare was significantly influenced by the different types of cutting (Table 2). The highest yield of tuberous roots (31.58 t/ha) was recorded when tip cuttings were used and this was followed by middle cuttings (28.79 t/ha). On the other hand the lowest (26.85 t/ha) yield of tuberous root was recorded in case of basal cuttings. Yield of tuberous root per hectare should significant variation due to combined effect of variety and vine cutting. The highest yield of tuberous roots per plot (20.77 kg) was recorded from the treatment combination of Tripti with tip cutting (V_1P_1) and the lowest tuberous yield per plot (11.54) was obtained from Daulatpuri with basal portion vine cuttings. planting were establishment quickly in the soil which encouraged initiation of more roots and

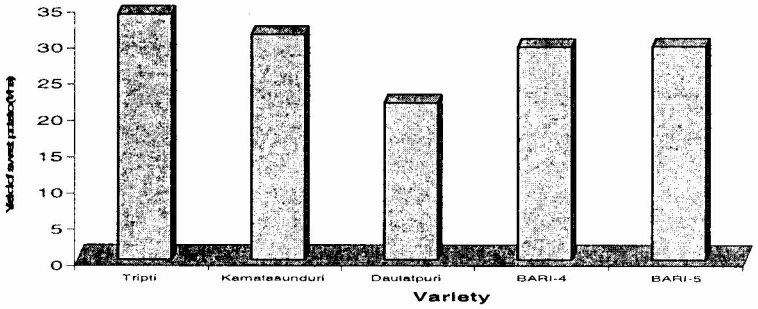

Fig. 1. Yield of tuberous roots of five sweet potato varieties (Vertical bar indicate LSD at 5% level).

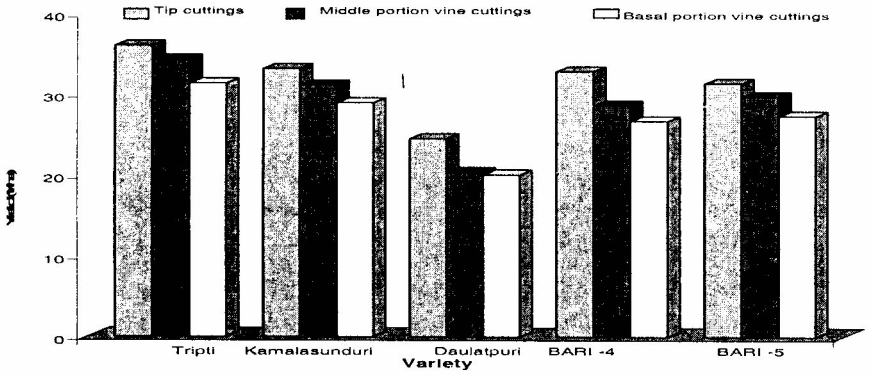

Fig. 2. Combined effect of variety and vine parts on yield of sweet potato (Vertcal bar indicate LSD at 5% level).

The corresponding yield of tuberous root was 36.07 and 20.03 ha respectively (Fig. 2).The result indicated that tip cuttings produced the maximum tuberous yield than those of others because tip cuttings after production of more branches resulting in the maximum vegetative growth and ultimate store of more starch in roots. The quick rooting was perhaps mainly due to the action of phytohormones particularly auxins in the apical region of the cuttings (Hartmann and Kester, 1978).

Dry matter contents of tuberous roots (%)

Dry matter contents of tuberous roots were significantly influenced by variety (Table 1). The maximum dry matter content of tuber (30.39%) was given by the variety Daulatpuri followed by BARI sweet potato-5 (30.11%), Tripti (28.33%), BARI sweet potato-4 (25.94%) and the lowest (23.33%) was recorded in the variety Kamalasunduri. There was significant effect of vine parts on dry matter of tuberous roots (Table 2). The maximum dry matter content (28.13%) was found from tip cuttings which was statistically similar to middle portion vine cuttings (28.00%). The lowest (26.73%) dry matter content of tuberous roots was found in plants of basal portion vine cuttings which differed statistically from others cutting. The variation due to combined effect of different variety and vine parts on dry matter content of tuberous roots was found significant (Table 3). The highest dry matter content (31.83%) was found in treatment combination of Daulatpuri with tip cuttings (V_3 P_1) and the lowest (22.33%) was found in treatment combination of variety Kamalasunduri with basal portion vine cuttings (V_2 P_3). The combined effect between varieties and vine parts on the parameter of dry matter contents of tuberous root was significant. The cause of maximum dry matter content of tuberous root by tip cuttings gave maximum vegetative growth as well as development of sweet potato tuberous roots which helped in maximum photosynthesis and accumulation of dry matter in the tuberous roots.

Weevil infestation of the tuberous roots (%)

Variety had significant effect on per cent weevil infested tuberous roots per plant (Table 1). The highest weevil infestation was occurred in Kamalasunduri (15.40%) which was statistically identical to the variety BARI sweet potato-4 (15.05%). The minimum weevil infestation (4.79%) was found from the variety Daulatpuri which was statistically similar with the variety Tripti (5.89%). Hussain and Choudhury (1989) stated that weevil infestation varied from variety to variety. The per cent weevil infestation of the tuberous roots varied significantly due to the effect of different types of vine parts (Table 2). The maximum weevil infestation of tubers (10.90%) was obtained when middle cutting were planted and this was followed by basal cuttings (9.82%). On the other hand the lowest percentage of weevil infestation (8.95%) was recorded in case of tip cuttings. The combined effect of varieties and vine parts on percentage of weevil infestation was significant (Table 3). The highest (19.72%) weevil infestation of tuberous roots was obtained from variety BARI sweet potato-4 with middle portion vine cuttings (V_4 P_2) which was statistically similar to the treatment combination of variety Kamalasunduri (18.21%) with middle portion vine cuttings(V_2 P_2). The lowest percentage (3.54%) of weevil infestation was found from the variety Daulatpuri with tip cuttings.

Regularity in shape of tuberous root

Regularity in shape exhibited significant variation on different varieties (Table 1). The score of regularity in shape of tuberous root as influenced by variety ranged between 2.93 to 6.57. The highest score of regular shape of tuberous root (6.57) was obtained from BARI sweet potato-5 followed by BARI sweet potato-4 (5.57), Kamalasunduri (4.40) and Daulatpuri (3.40). The lowest score (2.93) was found in the variety Tripti. Vine parts also had significant effect on regularity in shape of tuberous root (Table 2). The maximum regular tuber was found when tip cuttings were used and obtained highest score (5.26), it was due to less weevil infestation, the maximum growth and development. The lowest score of regular shape of tuberous roots (3.88) was found when basal cuttings were used. There was significant variation on production of regular shape of tuberous roots due to combined effect of varieties and various cuttings. The

highest score of regular shape of tuberous root (7.5) was obtained when the treatment combination of BARI sweet potato-5 with middle portion vine cuttings which was statistically similar to tip cuttings (7.00) of same variety (Table 3). The lowest score (2.2) was found in the treatment combination of Tripti with basal portion vine cuttings.

Table 3. Combined effect of variety and vine parts on the yield contributing characters and yield of sweet potato

Treatment combination	Weight of vines/plant (Kg)	Weight of tuberous roots/plant (Kg)	Weight of tuberous roots/plot (Kg)	Dry matter content (%)	Weevil infestation (%)	Regularity in shape of tuberous roots (score)
V_1P_1	0.68	0.70	20.77	28.83	5.72	3.60
V_1P_2	0.60	0.65	19.74	28.67	7.15	3.00
V_1P_3	0.59	0.60	18.07	27.50	4.81	2.20
V_2P_1	0.56	0.68	19.11	24.17	14.82	5.50
V_2P_2	0.52	0.60	17.93	23.50	18.21	4.20
V_2P_3	0.49	0.54	16.67	22.33	13.17	3.50
V_3P_1	0.50	0.55	14.09	31.83	3.54	4.00
V_3P_2	0.47	0.37	11.69	29.83	4.35	3.20
V_3P_3	0.44	0.33	11.54	29.50	6.48	3.00
V_4P_1	0.61	0.63	18.91	26.50	13.42	6.20
V_4P_2	0.49	0.45	16.45	26.50	19.72	5.00
V_4P_3	0.58	0.39	15.34	24.83	12.02	5.50
V_5P_1	0.51	0.62	18.05	31.00	7.27	7.00
V_5P_2	0.52	0.58	17.09	29.80	5.07	7.50
V_5P_3	0.47	0.50	15.71	29.30	12.60	5.20
LSD (0.05)	0.053	0.053	1.527	2.091	2.374	0.643
LSD (0.01)	0.071	0.071	2.06	2.821	3.202	0.868
CV (%)	6.12	5.61	5.45	4.53	14.35	8.41

V_1 : Tripti V_2 : Kamalasunduri V_3 : Daulatpuri V_4 : BARI Sweet Potato – 4 V_5 : BARI Sweet Potato - 5
P_1 : Tip cutting ,P_2 : Middle portion vine cutting ,P_3 : Basal portion vine cutting

Distribution of tuberous roots in different sizes (% by number)

There was a significant difference in distribution of tuberous root sizes among the varieties (Table 4). The highest percentage of large (above 200 g) tuberous roots (25.55%) was found in the variety Tripti, which was statistically similar to Kamalasunduri (25.06%) and BARI sweet potato-5 (23.90%). However, the lowest percentage of large tuberous roots (20.18%) was found

Table 4. Main effect of variety on the percentage of production of tuberous roots in different sizes by number and by weight

Variety	Per cent large tuberous root by number (>200 g)	Per cent medium tuberous root by number (100-200 g)	Per cent small tuberous root by number (<100 g)	Percent large tuberous root byweight(>200g)	Per cent medium tuberous root by weight (100-200 g)	Per cent small tuberous root by weight (<100 g)
V_1	25.55	41.26	33.18	41.83	42.90	15.27
V_2	25.06	45.04	30.24	42.84	44.28	12.88
V_3	20.18	38.92	41.15	39.20	44.05	16.75
V_4	22.64	39.87	37.27	44.82	41.57	13.61
V_5	23.90	39.81	37.20	45.76	44.34	9.90
LSD (0.05)	1.640	2.074	1.878	2.229	1.603	1.333
LSD (0.01)	2.213	2.798	2.534	3.006	2.163	1.798

V_1 : Tripti, V_2 : Kamalasunduri, V_3 : Daulatpuri, V_4 : BARI Sweet Potato – 4 and V_5 : BARI Sweet Potato – 5

in Daulatpuri. In case of medium (100 to 200 g) tuberous roots, the highest percentage of medium tuberous root (45.04%) was produced in Kamalasunduri and the lowest (38.92%) was found in Daulatpuri, which was statistically similar to BARI sweet potato-4 (39.87%) and BARI sweet potato-5 (39.81).

In case of small (<100 g) tuberous root the highest percentage (41.15%) was found in the variety Daulatpuri followed by BARI sweet potato-4 (37.27%), BARI sweet potato-5 (37.20%) and Tripti (33.18%). The lowest percentage of small tuberous roots (30.24%) was found in the variety Kamalasunduri. Vine parts showed significant variation in the production of large tuberous roots (>200 g) and small tuberous roots (<100 g) but non significant in case of medium tuberous roots (100-200 g) by number basis (Table 5). The highest percentage of large tuberous roots (26.99%) was produced from tip cuttings followed by middle cuttings (23.36%) and basal cuttings (20.05%). Vine parts were statistically different from each other in this respect. In case of medium (100-200 g) tuberous root the highest percentage of medium tuberous roots (41.16%) was found from basal cuttings and the lowest (40.71%) was obtained from tip cuttings.

Table 5. Main effect of vine parts on the percentage of production of tuberous roots in different sizes by number and by weight

Vine parts	Per cent large tuberous root by number (>200 g)	Per cent medium tuberous root by number (100-200 g)	Per cent small tuberous root by number (<100 g)	Per cent large tuberous root by weight (>200 g)	Per cent medium tuberous root by weight (100-200 g)	Per cent small tuberous root by weight (<100 g)
P_1	26.99	40.71	32.34	46.12	43.60	10.28
P_2	23.36	41.08	36.01	42.10	43.48	14.42
P_3	20.05	41.16	39.08	40.45	43.21	16.34
LSD (0.05)	1.270	--	1.455	1.726	--	1.032
LSD (0.01)	1.714	--	1.963	2.329	--	1.393

P_1 : Tip cutting, P_2 : Middle portion vine cutting and P_3 : Basal portion vine cutting

There was no statistical difference among the vine parts. In case of small (<100 g) tuberous roots the highest percentage of small tuberous roots (39.08%) was obtained from basal cuttings which differed statistically from tip and middle cuttings. The lowest percentage of small tuberous roots (32.34%) was found from tip cuttings. The combined effect of the percentage of large tuberous root (>200 g) varied significantly among the combination of variety and vine parts (Table 6). The highest percentage of large tuberous roots (30.72%) was obtained with the treatment combination of variety Tripti with tip cuttings and the lowest percentage (18.00%) was produced from the treatment combination of variety Daulatpuri with middle portion vine cuttings .In case of medium (100-200 g) tuberous roots the interaction between variety and vine part was significant and their combined effect was also significant. The highest percentage of medium tuberous root (46.40%) was obtained from the treatment combination of variety Kamalasunduri with basal portion vine cuttings, and lowest (38.00%) was recorded from BARI sweet potato-4 with basal portion vine cuttings. In case of small tuberous roots (<100 g) the interaction between variety and vine part was not significant but their combined effect was significant. The percentage of small tuberous roots ranged between 26.89% to 43.33%.

Table 6. Combined effect of variety and vine parts on the regularity in shape and percentage of distribution of tuberous roots in different sizes by number and by weight

Treatment combination	Per cent large tuberous root by number (>200 g)	Per cent medium tuberous root by number (100-200 g)	Per cent small tuberous root by number (<100 g)	Per cent large tuberous root by weight (>200 g)	Per cent medium tuberous root by weight (100-200 g)	Per cent small tuberous root by weight (<100 g)
V_1P_1	30.72	40.17	29.10	45.86	42.00	12.14
V_1P_2	25.09	40.29	34.62	40.92	42.41	16.67
V_1P_3	20.83	43.33	35.83	38.70	44.29	17.01
V_2P_1	30.22	43.45	26.89	45.32	44.09	10.59
V_2P_2	24.33	45.26	30.87	42.24	44.75	13.01
V_2P_3	20.63	46.40	32.96	40.96	43.99	15.05
V_3P_1	24.41	38.99	36.94	40.45	47.54	12.01
V_3P_2	18.00	38.67	43.33	38.23	43.55	18.22
V_3P_3	18.13	39.11	43.19	38.92	41.07	20.01
V_4P_1	24.73	40.15	34.46	48.97	40.76	10.27
V_4P_2	23.20	41.46	35.34	44.15	42.60	13.25
V_4P_3	20.00	38.00	42.00	41.34	41.35	17.31
V_5P_1	24.89	40.77	34.33	50.00	43.60	6.40
V_5P_2	26.16	39.70	35.87	44.97	44.07	10.96
V_5P_3	20.65	38.95	41.40	42.31	45.36	12.33
LSD (0.05)	2.841	3.592	3.252	3.859	2.777	2.308
LSD (0.01)	3.832	4.864	4.388	5.207	3.746	3.114
CV (%)	7.24	5.24	5.43	5.38	3.82	

V_1 : Tripti V_2 : Kamalasunduri V_3 : Daulatpuri V_4 : BARI Sweet Potato – 4 and V_5 : BARI Sweet Potato - 5
P_1 : Tip cutting P_2 : Middle portion vine cutting and P_3 : Basal portion vine cutting

Distribution of tuberous roots in different sizes (% by weight)

There was a significant difference in distribution of tuberous root by weight among the varieties .Variety BARI sweet potato-5 (45.76%) produced the maximum weight of large tuberous root followed by BARI sweet potato-4 (44.82%), Kamalasunduri (42.84%) and Tripti (41.83%). The lowest (39.20%) percentage of large tuberous roots was observed in the variety Daulatpuri.In case of medium tuberous roots, the highest percentage of medium tuberous roots (44.34%) was observed from the variety BARI sweet potato-5 which was statistically identical with Tripti (42.90%), Kamalasunduri (44.28%) and Daulatpuri (44.05%). The lowest (41.57%) percentage of medium tuberous roots was observed in the variety BARI sweet potato-4.In case of small tuberous roots, the highest percentage of small tuberous roots (16.75%) was found in the variety Daulatpuri. The lowest percentage of small tuberous roots (9.90%) was found in the variety BARI sweet potato-5.

Per cent size distribution of tuberous root by weight significantly influenced by the different types of cutting except medium tuberous roots (Table 5). The highest percentage of large tuberous root (46.12%) was found when tip cuttings were planted and this was followed by middle cuttings (42.10%). On the other hand, the lowest percentage of large tuberous root (40.45%) was recorded in case of basal cuttings. In case of medium tuberous roots, the percentage of medium tuberous roots ranged between 43.60% to 43.21%. Different types of cutting were statistically similar in this respect. In case of small tuberous roots the highest percentage of small tuberous root (16.34%) wa found when basal cuttings were used and this was followed by middle cutting (14.42%) and tip cutting

(10.28%).The combined effect between variety and vine parts was significant(Table 6). The highest percentage of large tuberous roots (50.00%) was found in the treatment combination of BARI sweet potato-5 with tip cuttings and the lowest (38.23%) in Daulatpuri with middle portion vine cuttings. In case of medium tuberous roots, the highest percentage of medium tuberous roots (47.54%) was obtained from the treatment combination of Daulatpuri with tip cuttings and the lowest percentage of medium tuberous roots (40.76%) was come from the treatment combination of BARI sweet potato-4 with tip cuttings. In case of small tuberous roots, the highest percentage of small tuberous roots (20.01%) was found in the treatment combination of Daulatpuri with basal portion vine cuttings and the lowest (6.40%) was obtained from BARI sweet potato-5 with tip cuttings.

From the results of the present investigation, it is concluded that tip cutting is the best in the production of sweet potato. In case of variety, Tripti gave the highest yield. The combination of Tripti with tip cuttings was found better than any other treatment combination in respect of yield in sweet potato production.

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