

Evaluation of Sweet Potato (*Ipomoea batatas* (L.) Lam.) Genotypes for Chhattisgarh Plains

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ABSTRACT

Sweet potato (*Ipomoea batatas* (L.) Lam.) is an important tuber crop grown for its tender leaves and tuber as a vegetable in Chhattisgarh plains. The tuber and tender leaves of this crop are very nutritious and used for preparation of various vegetarian dishes. It is consumed as boiled, dried and preserved form. It is sixth most important tuber crop in the world with an annual production of 138.4 million tonnes from 9.2 million hectares with a productivity of 15.0 t/ha (Edison, 2002). In India, it covered an area of 0.14 million hectares producing 1.71 million tonnes tubers with a productivity of 8.3 t/ha (Anonymous, 2000). Chhattisgarh covered an area of 2041.8 hectares producing 10965.6 tonnes with a very low productivity of 5.3 t/ha (Patil, 2001). Farmers of this agro-climatic zone are generally cultivating local sweet potato genotypes which are poor yielder in general. Hence, an experiment was carried out to evaluate twenty four genotypes of sweet potato at Department of Horticulture, Indira Gandhi Agricultural University, Raipur, Chhattisgarh in randomized block design with three replications and observations were recorded on vine length (cm), vine weight (g), number of tuber, number of marketable tuber, neck length of tuber (cm), tuber diameter (cm), tuber length (cm), biological yield (kg), tuber yield (t/ha), marketable tuber yield (t/ha), harvest index (%), total soluble solids (%), dry matter percentage of foliage (%) and dry matter percentage of tuber (%). Replicated data for each character was statistically analyzed. Experimental findings showed that sweet potato genotypes viz., Shree Bhadra (47.17 t/ha), shree Rathna (46.14 th/ha) and IGSP-12 (42.84 t/ha) recorded maximum total tuber as well as marketable tuber yield. Whereas, total soluble solids was recorded highest (17.10%) in IB-90-15-9 (Indira Sakarkand-I) followed by IGSP-31 (14.50), IGSP-10 (14.26) and Pol-21-1 (14.10). Hence, these sweet potato genotypes may be suitable for Chhattisgarh plains.

Keywords: Sweet potato (*Ipomoea batatas*), tuber yield, soluble solids

Sweet potato is an important root crop of the tropics and sub-tropics. The tuber yield depends on the harvesting stage of the crop and economic yield of most the existing varieties are obtained when harvested beyond five months. Sen *et al.* (1989) reported that tuber yield of sweet potato depends on harvesting stage of the crops and highest yield were obtained at 180 days in most of the entries but weevil infestation increased beyond 120 days. Toib and Rashid (1976) also obtained the optimum yield of sweet potato harvested after five months stage. As most of the existing entries need longer duration (beyond 150 days) for optimum yield, the crop was uneconomic in sequential cropping. Hence

to overcome this problem a systematic research has been done to identify early bulking and high yielding genotypes suitable for this region. The performance of some cultivars in the agroclimatic conditions of Chhattisgarh is reported in this paper.

MATERIALS AND METHODS

A field experiment was conducted at Department of Horticulture, Indira Gandhi Agriculture University, Raipur, Chhattisgarh alongwith 24 sweet potato genotypes in randomized block design with three replications. These genotypes were Sree Bhadra, IGSP-4, Shree Rethna, IGSP-12, IGSP-17, IB-90-15-9 (Indira Sakarkand-1), Pol-21-1, Bastar

Table 1: Tuber yield and yield attributes of different entries of sweet potato

Characters / genotypes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Sree bhadra	140.33	321.33	3.96	2.73	29.33	22.11	15.15	1146.66	825.33	640.16	47.17	36.56	71.95	12.40	20.00	26.00
IGPS-4	88.60	311.33	5.23	4.13	43.00	17.63	10.26	810.33	499.00	389.90	28.51	22.61	61.49	12.50	20.00	22.00
Shree Rethna	158.00	332.00	4.63	4.20	37.66	16.05	14.83	1139.33	807.33	731.90	46.14	41.80	70.88	12.00	20.00	30.00
IGPS-12	199.00	330.33	4.73	4.53	41.33	21.62	12.49	1080.00	749.66	718.96	42.84	41.04	69.39	13.20	20.00	30.00
IGPS-17	125.66	209.66	4.80	3.93	33.66	24.66	13.59	814.66	605.00	494.90	34.57	28.27	73.99	12.80	24.00	26.00
IB-90-15-9(S)	137.00	288.00	3.80	3.53	35.00	15.56	12.34	846.66	558.66	512.26	31.92	29.24	65.64	17.10	22.00	32.00
Pol-2101	115.33	141.66	4.46	3.46	23.33	15.31	12.06	620.00	478.33	363.06	27.33	20.71	77.23	14.10	20.00	32.00
IGSP-15	330.66	415.00	3.00	3.06	44.00	24.51	9.17	862.00	482.33	492.60	27.57	28.12	56.01	13.40	26.00	30.00
IGSP-31	137.00	153.33	3.40	3.06	44.66	16.83	14.13	776.66	623.33	567.10	35.62	32.38	80.06	14.50	20.00	30.00
NDSP-16	244.33	273.33	3.46	3.00	25.00	13.55	12.51	763.66	490.00	419.80	28.00	23.95	64.15	12.36	22.00	32.00
Kalyani local	223.33	332.33	5.20	3.50	20.00	15.13	11.15	812.00	546.33	364.83	31.22	20.82	62.29	12.03	24.00	30.00
IGPS-11	95.90	330.33	3.40	2.83	44.00	21.12	10.46	948.00	617.66	519.83	35.30	29.68	65.1	12.03	24.00	32.00
56-2	110.66	157.00	3.26	3.03	26.66	19.63	12.46	653.00	496.00	461.03	28.34	26.32	75.71	12.13	16.00	30.00
IB-90-11-1	113.66	333.33	4.00	2.80	17.33	16.41	10.82	729.66	396.33	281.33	22.64	16.05	54.33	11.50	20.00	34.00
IGPS-26	218.66	169.00	4.00	3.13	12.33	21.43	21.43	12.23	601.00	496.50	34.34	28.34	78.04	11.06	30.00	28.00
IGPS-10	132.66	190.00	3.53	2.73	8.33	15.43	11.97	781.66	591.66	458.13	33.81	26.17	75.66	14.56	28.00	30.00
IGPS-13	224.66	350.00	4.26	3.73	7.33	22.38	10.93	873.33	523.33	454.63	29.90	25.96	59.72	13.53	22.00	27.00
IGPS-18	291.00	275.00	3.73	3.20	29.66	19.05	8.39	666.00	391.00	331.30	22.34	18.89	58.85	10.40	24.00	28.00
IGPS-9	150.33	302.00	3.73	3.33	24.00	19.47	8.90	766.33	464.33	430.53	26.53	24.57	60.39	11.00	20.00	36.00
IGPS-8	152.00	293.33	4.26	3.60	37.00	19.61	8.84	693.00	433.00	365.16	24.74	20.83	59.53	12.56	22.00	30.00
Kalmegh	135.33	191.66	3.60	2.60	2.40	24.66	17.69	11.57	605.00	421.26	34.57	24.23	75.86	12.43	18.00	22.00
H-633	113.00	191.66	3.60	2.40	24.66	17.69	11.57	796.66	392.33	315.16	22.42	17.97	66.92	12.80	16.00	36.00
Gouri	96.20	111.33	3.86	2.93	32.33	14.72	11.36	539.66	428.33	319.33	24.47	18.23	79.36	13.43	22.00	36.00
IB-90-10-20	116.66	200.00	3.66	3.33	43.33	13.98	11.29	648.33	448.33	403.20	25.62	23.01	68.82	10.73	18.00	26.00
Grand mean (x)	160.40	258.45	3.99	3.30	30.44	18.24	11.49	796.73	543.90	456.37	31.08	26.07	67.97	12.68	22.00	29.00
CV (%)	15.73	13.98	11.24	24.12	13.16	9.14	9.14	10.64	11.55	13.36	22.60	13.37	22.70	5.31	5.28	4.90
SE (Diff)	5.51	7.38	0.09	0.16	0.82	0.34	0.34	0.25	18.78	14.83	21.06	0.85	1.21	0.74	0.20	0.30
CD (at 5%)	14.63	20.95	0.26	0.46	2.32	0.97	0.97	0.71	53.34	42.11	59.80	2.41	3.43	2.09	0.57	0.85

Local(IGSP-15), IGSP-31, NDSP-16, Kalyani Local IGSP-11, 56-2, IB-90-11-1, IGSP-26, IGSP-10, IGSP-13, Balaghat Local (IGSP-18), IGSP-9, IGSP-8, Kalmegh, H-633, Gouri and IB-90-10-20. Vine cutting (20 cm) were planted in third week of September with 60 cm spacing between row and 20 cm spacing between plants. Observation on vine length, vine weight, number of tuber neck length of tuber, tuber length, tuber diameter, biological yield, tuber yield, Total soluble solids were recorded at harvest (130 days after planting). Dry matter per cent of foliage and harvest indices were also noted.

RESULTS AND DISCUSSION

Among the twenty four entries of sweet potato, vine length and vine weight per plant differed significantly at harvest and the entry IGSP-15 (Bastar Local) recorded the maximum vine weight per plant (415 g) followed by IGSP-13 (350 g) and IB-90-11-1 (333 g) Kamalam *et al.* (1977) reported that tuber yield of sweet potato was negatively correlated with vine length and vine weight.

Highest number of tubers per plant were obtained in the entries IGSP-4 and Kalyani local whereas, the maximum neck length of tuber (46.66 cm) was recorded in H-633. The maximum tuber length was recorded in IGSP-17. The tuber yield per plant of sweet potato genotypes markedly influenced the tuber yield varying from to 22.34 to 47.17 t/ha at harvest and the genotype Shree Bhadra recorded the highest tuber yield (47.17 t/ha) which was

significantly superior, followed by Shree Rethna (46.14 t/ha). Tuber diameter and biological yield is also highest in entry Sree Bhadra. The highest harvest index was recorded in IGSP-31 (80.06%), whereas it was lowest in entry IB-90-11-1 (54.33%). Enyi (1977) obtained significant correlation between root yield and harvest index. Total soluble solids was higher in genotype IB-90-15-9 (17.10%). The variation in dry matter per cent of foliage and tuber due to cultivars was also obtained. Dry matter percentage were recorded lowest in the entries IGSP-26 (30.00) and highest in IGSP-9 and H-633 (36.00) respectively.

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