SHORT COMMUNICATION

EVALUATION OF SWEET POTATO (*IPOMOEA BATATAS* (L.) LAM.) GENOTYPES FOR YIELD AND YIELD ATTRIBUTING CHARACTERS UNDER AGRO-CLIMATIC CONDITION OF CHHATTISGARH

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Abstract: An experiment was conducted at Research and Instructional Farm of Department of Horticulture, Indira Gandhi Krishi Vishwavidyalaya, Raipur (C.G.) during the *rabi* season of 2013-2014 with an objective to find out sweet potato genotypes suitable for Chhattisgarh plains. The experiment was laid out in randomized block design in three replications with twelve genotypes of sweet potato. Observations in respect of growth yield and quality parameters were recorded on five competitive random plants from each replication. According to mean performance of the sweet potato genotypes in respect to tuber yield per hectare, IGSP-20 (37.33 t/ha) was found significantly superior than the other genotypes evaluated.

Keywords: Sweet potato, genotypes, yield, characters

INTRODUCTION

Sweet potato [*Ipomoea batatas* (L.) Lam.] locally known as Shakarkand is one of the most popular tuber crops in India and abroad because of its yield potential and high calorific value. It is mainly cultivated almost in all the tropical and subtropical countries as well as in the warmer region of temperate countries. Sweet potato is the world's seventh most important food crop other than wheat, rice, maize, barley, potato and cassava. Among the major tuber crops cultivated in India, sweet potato ranks third next to potato and cassava in area and production. In India, it is grown in an area of 1.12 Lakh ha and produces 11.57 Lakh MT with a productivity of 10.33 t/ha (Anon., 2013). Odisha is leading state in area and production of sweet potato, whereas, productivity is highest in Andhra Pradesh. In Chhattisgarh state, it is cultivated in an area of 3.71 thousand hectare area with production of 37.8 thousand tonnes and productivity of 10.189 t/ha. (Anon, 2013). In spite of climatic suitability the area, of sweet potato in Chhattisgarh state is very low as compared to other state and the national acreage. Although the crop is very popular in urban as well as rural area of the state but it is cultivated in limited area. Unavailability of planting material as early bulking, high yielding and better quality varieties is one of the major factor for limit the area and production of this crop. However, to improve the tuber yield in Chhattisgarh, this study was conducted to evaluate the performance of sweet potato genotypes during *rabi* season.

MATERIAL AND METHOD

The present study was conducted at Research and Instructional Farm, Department of Horticulture, Indira Gandhi Krishi Vishwavidyalaya, Raipur (C.G.) during the *rabi* season of 2013-2014. The experimental material comprised of twelve genotypes (Indira Madhur, Indira Naveen, Indira Nandini, Sree Rethna, IGSP.C-15, Gauri, IGSP-20, IGSP-21, IGSP-39, IGSP-36, IGSP-24 and IGSP-25) of sweet potato and the experiment was laid out in a randomized block design with three replications at the spacing of 60 cm between rows and 20 cm between plants to plant. A plot size of 1.8 m x 2 m was kept for each genotype. All the recommended cultural practices were taken to grow a healthy crop. Data were recorded on five randomly selected plants for fourteen characters *viz*., vine length (cm), inter node length (cm), vine diameter (cm), vine weight (g), number of tubers per plant, neck length (cm), tuber length (cm), tuber diameter (cm), tuber yield per plant (g), marketable tuber yield per plant (g), weevil tuber yield per plant (g), biological yield per plant (g), harvest index (%), dry matter percentage of tuber, dry matter percentage of vine and TSS (%). Three characters *viz*., tuber yield (t/ha), marketable tuber yield (t/ha) and weevil infested tuber yield (t/ha) were calculated on the basis of observed yield data.
The data were subjected to statistical and biometrical analysis (Singh and Chaudhary, 1985).

RESULT AND DISCUSSION

The mean values of different growth parameters with respect to genotypes are presented in table 1. Wide range of variation was found for vine length, vine weight, neck length, tuber yield, biological yield per plant, harvest index and narrow range for vine diameter, tuber length, tuber diameter, dry matter percentage of both vine and tuber and TSS.
Maximum vine length was recorded in Sree Rethna (183.7 cm) followed by Gauri (132.8 cm), Indira Nandini (108.70cm) and IGSP-20 (104.93 cm) whereas, the highest inter node length recorded in Sree Rethna (5.47 cm) followed by Indira Nandini (4.63 cm) and Indira Naveen (4.30 cm). Mean performance of vine diameter was recorded maximum in IGSP-25 (0.47 cm) followed by IGSP-20 (0.46), IGSP-39 (0.45), IGSP-36 (0.45) and

maximum vine weight was recorded in Indira Naveen (555.33 g) followed by Sree Rethna (543.80 g), IGSP-25 (533.33 g) and IGSP-20 (532.43 g).

The number of tubers per plant found maximum in Gauri (5.57) which was followed by Indira Naveen (4.83) and Indira Nandini (4.70), whereas, largest neck length observed in IGSP-25 (8.61 cm) followed by IGSP-20 (7.39 cm), Indira Madhur (5.67 cm) and maximum tuber length was found in IGSP-25 (19.06 cm) followed by Indira Naveen (18.67 cm) and IGSP-20 (18.51 cm). IGSP-20 was showed maximum tuber diameter (4.15 cm) and maximum tuber yield per plant (487.3 g). The significantly highest total yield per hectare was recorded in genotype IGSP-20 (37.33 t/ha) followed by Indira Naveen (23.15 t/ha) and Sree Rethna (23.01 t/ha). The marketable tuber yield was same as total tuber yield because weevil infested tuber yield was only seen in one genotype (Indira Naveen). Whereas, lowest tuber yield was obtained in genotype IGSP-36 (10.11 t/ha). Similar findings were also reported earlier by Goswami (1990), Kamalam (1990), Tirkey (2006), Saikia *et al.* (2009) and Mhaskar *et al.* (2013). The maximum biological yield per plant was obtained by the genotype IGSP-20 (1030.2 g) which was significantly superior to all the genotypes. The maximum harvest index was obtained in IGSP-C-15 (65.50%) which was statistically similar with IGSP-24 (58.73%), IGSP-20 (48.3%), Indira Nandini (41.1%). The maximum dry matter per cent of foliage was obtained in Gauri (27.13%) and maximum dry matter per cent of tuber was obtained in IGSP-39 (36.6%). Maximum TSS recorded IGSP.C-15 (16.87%) followed by IGSP-25 (13.43%), IGSP-20 (11.1%), IGSP-24 (10.83%) and Gauri (10.67%).

Table 1. Mean performance of tuber yield and its components in sweet potato

Treatment/character	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Indira Madhur	67.40	2.90	0.41	235.77	4.17	5.67	15.98	2.10	171.3	171.3	0	12.85	12.85	0	407.1	42.13	22.97	24.43	9.5
Indira Naveen	86.13	4.30	0.41	555.33	4.83	4.54	18.67	2.33	308.7	291.7	17.3	23.15	21.87	1.28	864	35.4	22.47	26.67	7.5
Sree Rethna	183.70	5.47	0.44	543.80	3.93	5.21	14.19	3.14	306.7	306.6	0	23.01	23.01	0	838.67	36.43	23.01	32.03	8.43
Indira Nandini	108.70	4.63	0.43	343.10	4.70	5.50	16.44	2.83	239.3	239.3	0	17.96	17.96	0	582.63	41.1	22.8	31.53	9.2
IGSP.C-15	49.87	2.03	0.41	138.40	1.93	3.37	12.34	2.74	277.7	277.6	0	20.83	20.83	0	416.17	65.5	22.13	28.4	16.87
Gauri	132.80	3.70	0.37	491.33	5.57	4.01	15.26	2.71	239.7	239.6	0	20.48	20.48	0	764.43	35.6	27.13	36.57	10.67
IGSP-20	104.93	3.40	0.46	532.43	3.37	7.39	18.51	4.15	487.3	487.3	0	37.33	37.33	0	1030.2	48.3	20.11	27.13	11.1
IGSP-39	89.03	3.90	0.45	405.10	4.40	4.22	14.27	3.15	284.3	284.3	0	21.33	21.33	0	689.53	41.3	22.11	36.6	8.33
IGSP-21	61.77	2.17	0.29	427.53	3.93	4.27	15.73	2.76	260	260	0	19.51	19.51	0	687.73	37.67	23.43	28.47	8.97
IGSP-25	53.07	2.03	0.47	533.33	3.27	8.61	19.06	2.21	228.3	228.3	0	17.13	17.13	0	761.77	29.97	25.4	35.23	13.43
IGSP-24	39.30	1.47	0.40	107.43	4.13	3.54	15.41	2.87	153.3	153.3	0	11.51	11.51	0	260.77	58.73	22.1	32.03	10.83
IGSP-36	91.13	2.70	0.45	446.10	4.00	1.84	16.21	3.00	145.3	145.3	0	10.11	10.11	0	580.3	23.33	19.27	21.53	7.27
Mean	**88.98**	**3.22**	**0.41**	**396.63**	**4.01**	**4.84**	**16.0**	**2.83**	**258.5**	**257.0**	**1.4**	**19.59**	**19.49**	**0.1**	**656.94**	**41.28**	**22.74**	**30.05**	**10.17**
SEm	**4.2**	**0.23**	**0.03**	**29.8**	**0.30**	**0.38**	**0.69**	**0.26**	**25.9**	**24.9**	**4.89**	**1.7**	**1.7**	**0.3**	**42.83**	**2.62**	**0.76**	**0.76**	**0.26**
CD	**12.67**	**0.73**	**0.10**	**89.65**	**0.91**	**1.16**	**2.07**	**0.78**	**77.9**	**74.9**	**14.67**	**5.3**	**5.3**	**1.0**	**128.5**	**7.88**	**2.28**	**2.28**	**0.80**
CV (%)	**8.42**	**13.32**	**16.35**	**13.34**	**13.57**	**14.81**	**7.70**	**16.66**	**17.80**	**17.22**	**600**	**16.49**	**17.21**	**600**	**11.58**	**11.4**	**6.26**	**4.81**	**4.8**

1. Vine length (cm), 2. Inter node length (cm), 3. Vine diameter (cm), 4. Vine weight (g), 5. Number of tubers per plant, 6. Neck length, (cm), 7. Tuber length (cm), 8. Tuber diameter (cm), 9. Tuber yield (g/plant) 10. Marketable tuber yield (g/plant), 11. Weevils infested tuber yield (g/plant), 12. Tuber yield (t/ha) 13. Marketable tuber yield (t/ha), 14. Weevil infested tuber yield (t/ha), 15. Biological yield (g/plant), 16. Harvest index (%), 17. Dry matter % of foliage, 18. Dry matter % of tuber and 19. TSS (%)

REFERENCES

Anonymous, (2013). Indian Horticulture Database, *National Horticulture Board*, Gurgaon.

Chaurasia, P. C. (2012). Combining ability analysis for yield and quality attributes in sweet potato [*Ipomoea Batatas* (L.) Lam.]**.** *Ph. D. Thesis, IGAU, Raipur.*

Goswami, R. K. (1990). Variation in growth attributes and quality parameters in some sweet potato [*Ipomoea batatas* (L.) Lam.]. *J. Root Crops*, **16**(2): 73-75.

Kamalam, P. (1990). Variation for quantitative traits in the first clonal generation of open pollinated progenies of sweet potato [*Ipomoea batatas* (L.) Lam.]. *J. Root Crops*. **16**: 49-52.

Mhaskar, N. V., Jadye, A. T., Haldankar, P. M., Bhangare, B. N. and Mahadkar, U. V. (2013). Kamala Sundari: A high yielding orange fleshed sweet potato for konkan region of Maharastra. *J. Root Crops,* **39**(1): 28-32.

Sahu, G. D., Singh, J. and Mehta, N. (2005). Correlation and path analysis in sweet potato. *Environment and Ecology*, **23**(2): 207-211.

Saikia, J., Borah, P. and Nath, D. K. (2009). Evaluation of few carotene rich sweet potato [*Ipomoea batatas* (L.) Lam.] genotypes under Assam condition. *J. Root crops*, **35**(2): 232-235.

Singh, R. K. and Chaudhury, B.D. (1985). Biometrical method of quantitative genetic analysis. Haryana J. *Hort. Sci*., **12**(2): 151-156.

Tirkey, P. (2006). Studies on orange fleshed sweet potato genotypes [*Ipomoea batatas* (L.) Lam.] for yield and quality traits. *M.Sc. (Ag.) Thesis, IGAU, Raipur.*