

## RESEARCH NOTES

### FODDER PRODUCTION POTENTIAL OF SWEET POTATO (*IPOMOEA BATATAS*)

The main problem facing animal husbandry in India is the extremely low production of good quality fodder. It is noticed that other than the traditional fodder grasses and legumes, the green and tender parts of food crops are also utilised as livestock feeds during the lean periods. Leaves and tender shoots of sweet potato (*Ipomoea batatas*) are used as cattle feed in many parts of the tropics. It is estimated that on dry basis, the leaf contains 27% protein, 8% starch, 4% sugar and 10% ash. It also contains 56 mg carotene per 100 g of dry matter. The leaves are much richer than tuber in protein, minerals and vitamin contents (Onwueme, 1978). Kamalam *et al.* (1977) reported that the tuber yield of sweet potato was negatively correlated with weight and length of vines. Gonzales *et al.* (1977) also recorded reduced tuber yield due to topping. However, detailed investigation on the fodder production potential of this crop is lacking. Hence the present study was taken up with the object of assessing the fodder production potential of sweet potato under varying levels of nitrogen, and also to assess the influence of topping on the normal tuber yield of this crop. The experiment was carried out in the Instructional Farm, College of Agriculture, Vellayani, during the period from May to September 1979. The soil of the experimental site was red loam with a pH of 5.2. The soil was found to contain 0.053, 0.009, 0.67, 0.032 and 0.0673 per cent of total nitrogen, available nitrogen, organic carbon, total  $P_2O_5$  and total  $K_2O$  respectively. The treatments consisted of four levels of nitrogen (0, 30, 60 and 90 kg/ha) laid out in Randomised block design with five replications. 'Kottaramchuvala', the local variety of sweet potato was utilised for the trial. After land preparation, beds of 3 m length and 1 m width were prepared. Nitrogen in the form of urea was applied as per the treatments at the time of planting.  $P_2O_5$  at the rate of 50 kg/ha and  $K_2O$  at the rate of 75 kg/ha were also applied basally. Nine inches long vines having an average number of 3 nodes were planted at a spacing of 20 cm x 20 cm. A total rainfall of 23.68 cm was received during the crop period. Leaves and young stems of plants were harvested leaving 30 cm at the base of the stem so as to produce further shoot growth. The crop was left for tuber development thereafter.

The data on length of vines, green fodder yield, dry fodder yield and tuber yield are presented in Table 1.

The results revealed that vine length increased with increase in the level of applied nitrogen. Ninety kg N/ha was on par with 60 kg N/ha but was significantly superior to 30 kg N/ha and this was in turn superior to 0 kg N/ha. Nitrogen was thus found to be favouring the growth of sweet potato vines. Green fodder

yield was also significantly influenced by the application of nitrogen, Ninety kg/ha recorded the maximum green fodder yield which was on par with 60 kg N/ha and both these nitrogen levels were significantly superior to the lower doses of nitrogen. Increase in vine yield as a result of nitrogen application was reported by many workers (Yuan *et al.* 1954; Morita, 19-37 and Black, 1968). Regarding the dry fodder yield also a similar trend was observed. The difference in tuber yield due to varying levels of nitrogen was also significant. The maximum raw tuber yield of 7.01 t/ha was recorded at 90 kg N ha but this was on par with the yields obtained by 60 kg N/ha and 30 kg N/ha

Table 1

Vine length, green fodder yield, dry fodder yield and tuber yield of sweet potato as influenced by different levels of nitrogen

Sl. No.	Treatments	Length of vine (cm)	Green fodder yield (t/ha)	Dry fodder yield (t/ha)	Tuber yield (t/ha)
1	0 kg N/ha	50.21	5.55	1.01	3.12
2	30 "	62.48	6.94	1.66	4.82
3	60 "	88.88	10.72	2.24	6.69
4	90 "	104.24	11.27	2.26	7.01
	CD (P=0.05)	16.562	16.761	0.609	2.924

സംഗ്രഹം

'കൊട്ടാരം ചുവല' എന്ന നാടൻ ഇനത്തിൽപ്പെട്ട മധുരക്കിഴങ്ങ് ചെടിക്കു വിവിധ അളവിൽ നൈട്രജൻ നൽകി അതിന്റെ ഫോഡർ വിളയുൽപ്പാദന ശേഷിയെപ്പറ്റി ഒരു പരീക്ഷണം വെള്ളായണി കാർഷിക കോളേജിൽ നടത്തി നോക്കി. ഹെക്ടറിന് 90 കി. ഗ്രാം നൈട്രജൻ നൽകിയപ്പോഴാണ് ഏറ്റവും കൂടുതൽ ഫോഡർ വിളവ് (11.27 ടൺ) ലഭിച്ചത്.

Acknowledgement

The authors are thankful to Dr. N. Sadananjan, Dean, Kerala Agricultural University for the facilities rendered for this investigation and to the ICAR for permission for publication of the results which formed part of the All India Co-ordinated Project for Research on Forage crops.

References

Black, C. A. 1938 *Soil Plant Relationship*. John Wiley and Sons Inc., New York.  
 Gonzales, F. R. and Bugawan, M. S. 1977. Effects of topping and fertilization on the yield and protein content of 3 varieties of sweet potato. *Phillippine Journal of Crop Science*, 2, 97-102.

- Kamalam, P., Birader, R. S., Hrishu, N. and Rajendran, P. G. 1977. Path analysis and correlation studies in sweet potato (*Ipomoea batatas*). *Journal of root crops* 3, 5-11.
- Morita, T. 1967. Effect of application time of nitrogenous fertilizers on top growth tuber formation and development of sweet potatoes. *J. Jap Soc. Hort. Sci.*, 36, 21-26.
- Onwueme, I. C. 1978. *The Tropical Tuber Crops*. John Wiley and Sons, New York, pp. 172-174.
- Singh, K. D., Mandal, R. C., Maini, S. B. and Maggoon, M. L. 1973. Influence of N and K fertilization on the tuber yield and quality of *Dioscorea esculenta*. *Ind. J. Agron.* 18, 17-21.
- Yuan, P. C., Lu, H. P., Chich, Y. F. and Tang, A. J. 1954. The physiological basis and fertilizer practices on sweet potato for high yield production. *Crop Sci. Peking*, 3, 33-38.

Kerala Agricultural University,  
College of Agriculture,  
Velfayani 695 522  
Trivandrum

G. RAGHAVAN PILLAI  
KAMALAM JOSEPH  
C. SREEDHARAN

(MS Received: 3-5-1980)