

EFFECT OF GRADED DOSES OF NITROGEN ON GROWTH AND YIELD OF SWEET POTATO VARIETY, H.42 IN RED-LOAM SOILS

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The yield of sweet potato (*Ipomoea batatas*, Lam.) is limited more often by nitrogen than by any other essential element. However, moderate application of nitrogen is reported to result in conspicuous increase in tuber yields, but excessive application has an opposite effect. Significant increase in growth and yield of tubers upto 75 kg. nitrogen per hectare was recorded by Mandal *et al* (1968 and 1971) and upto 80 kg by Dasharathi and Padmanabhan (1972). In the absence of adequate experimental evidences on the nitrogen nutrition of sweet potato in the red loam soil conditions, the present investigation was carried out to study the effect of graded levels of nitrogen on the growth and tuber yield of sweet potato.

Materials and Methods

The experiment was conducted in the red-loam soils of the Instructional Farm of the College of Agriculture, Vellayani during September 1974 to January, 1975. The soil was low in total nitrogen, medium in available phosphorus and high in available potash and was moderately acid in reaction. The variety used was H, 42. The experiment was laid out in a randomised block design. The net plot size was 3.6 metres x 3.5 metres. The treatments consisted of 3 levels of nitrogen (50, 75 and 100 kg. N/ha) in the form of ammonium sulphate and applied half as basal and the remaining half one month after planting. A uniform dose of 10 tonnes cattle manure, 50 kg. P_2O_5 as super phosphate and 75 kg. K_2O as muriate of potash per hectare was applied basal. Usual cultural operations and irrigation were done as and required. Observations on growth characters and yield were recorded and analysed statistically.

Results and Discussion

The results are presented in Table 1. The effect of nitrogen on length of vine was not significant. But there was an increasing trend with increasing levels of nitrogen.

The failure of nitrogen to bring about significant increase in vine length when there was wide difference in total amount of nitrogen supplied may be due to the fact that soil nitrogen supplemented by applied nitrogen at half the maximum dose would have been adequate to maintain vine length at a reasonably high level.

Table 1

Mean values of growth characters and yield of sweet potato as influenced by nitrogen.

Treatment	Mean length of vine at harvest cm.	Mean wet weight of vine per plant, kg.	Mean length of tuber cm.	Mean girth of tuber cm.	Mean No. of tubers per plant.	Mean yield of tubers kg/ha.
50 Kg. N/ha	88.92	0.165	9.855	12.472	1.60	8143
75	89.16	0.161	9.695	11.051	1.96	9421
100	91.74	0.167	9.360	9.980	2.24	10492
'F' test	NS	NS	NS	Sig	Sig	Sig
SEm , +	1.52	0.003	0.42	0.27	0.0587	229.04
CD (0.05)				1.53	0.173	670.55

Wet weight of vine at harvest was also not influenced by levels of nitrogen. However, there is an increasing trend due to higher level of nutrient which could be attributed to the general effect of nitrogen in increasing vegetative growth of plants.

The length of tuber was not influenced by the levels of nitrogen. But girth of tuber was significantly reduced with increasing levels of nitrogen. It was also noticed that the number of tubers per plant was successively increased due to incremental doses of nitrogen and probably the increased number of tuber production per plant might have been responsible for the reduction in the girth of tubers at higher levels of nitrogen.

There was significant increase in the yield of tubers due to incremental doses of nitrogen. Nitrogen at 100 kg. per hectare gave an average yield of 104.92 quintals of tuber which was superior to 94.2 quintals being the tuber yield at 75 kg. N/ha. The lowest level of 50 kg. N/ha gave only an yield of 81.4 quintals of tubers per hectare. This shows that the response of sweet potato to nitrogen is linear. The beneficial effects of nitrogen in increasing the number and weight of tuber per plant combined with its primary functions in plant growth might have contributed to the total increase in the yield of tubers.

Summary

A field experiment was conducted in the red-loam soils of Agricultural College Farm, Vellayani during 1974 - 1975 to study the effect of graded doses

of nitrogen (50, 75 and 100 kg/ha) on the growth and yield of sweet potato, variety H. 42. The length of vine, weight of vine, and length of individual tuber were not significantly influenced by levels of nitrogen whereas the number of tubers per plant was significantly increased due to incremental doses of this nutrient and the response was linear. The yield of tuber was increased progressively with incremental doses of nitrogen. Nitrogen at 100 kg./ha recorded an yield of 104.92 quintals of tuber per hectare while 50 kg. N/ha gave only an average yield of 81.43 quintals.

സംഗ്രഹം

വെള്ളായണി കാർഷിക കോളേജിലെ ചുവന്ന ലോം മണ്ണിൽ ഹെക്ടറിന് 50, 75, 100 കിലോഗ്രാം എന്ന തോതിൽ നൈട്രജൻ എച്ച്. 42 എന്നയിനം മധുരക്കിഴങ്ങിന് നൽകിയ ഒരു പരീക്ഷണം 1974-75ൽ നടത്തുകയുണ്ടായി. ഇതിൽനിന്നും, മധുരക്കിഴങ്ങ് വളയിന്റെ ml ഉം, തൂക്കം, കിഴങ്ങിന്റെ നീളം എന്നീ സ്വഭാവങ്ങൾ നൈട്രജന്റെ തോതനുസരിച്ച് ഗണ്യമായി വ്യത്യാസപ്പെടുന്നതായി അനുഭവപ്പെട്ടില്ല. എന്നാൽ ഓരോ ചെടിയ്ക്കുമുണ്ടാകുന്ന കിഴങ്ങുകളുടെ എണ്ണവും മൊത്തത്തിൽ ഉണ്ടായ കിഴങ്ങിന്റെ തൂക്കവും നൈട്രജൻ കൂടുന്നതിനനുസരിച്ച് വർദ്ധിക്കുന്നതായി കണ്ടു. നൈട്രജൻ ഹെക്ടറിന് 100 കിലോഗ്രാം എന്ന തോതിൽ ചേർത്തപ്പോൾ, ഒരു ഹെക്ടറിൽ rolcroa 104.92 ക്വിന്റൽ കിഴങ്ങ് 50 കിലോഗ്രാം നൈട്രജൻ ചേർത്തതിൽ നിന്നും 81.43

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