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Effect of Different Levels of Nitrogen and Phosphorus on the Fruit Yield of Muskmelon (*Cucumis melo*) VAR., GMM-1

T. G. Meisheri, K. V. Jadav, J. J. Patel and D. P. Patel

Department of Agronomy, GAU, Anand Campus, Anand

ABSTRACT

A field experiment was conducted during the years 1977-78 and 1978-79 at college Agronomy Farm, Gujarat Agricultural University, Anand Campus, Anand in order to study the effect of different levels of nitrogen and phosphorus on total fruit yield of muskmelon ,var, GMM-1, which has been recently released by Gujarat Agricultural University. It is the most suited variety for irrigated conditions on sandy loam soils of middle Gujarat.

The crop of Muskmelon, Var., GMM-1, was fertilized with four levels of nitrogen (80, 120, 160 and 200 kg/ha) and three levels of phosphorus (40, 60 and 80 kg/ha). It was found that application of nitrogen @80 kg/ha and phosphorus @40 kg/ha produced significantly more fruit yield in the second year and in pooled analysis than the rest of the treatments under study. The mean CBR for the two years indicated the ratio was 1:2.19 for N 80 + P 40. It is bettre than rest of treatments.

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INTRODUCTION

Muskmelon (*Cucumis melo*), being good in taste and a rich source of vitamins A, B and C is highly relished by all the classes of people. Hence it is regarded as poor man's fruit. It is also a rich source of minerals like calcium, phosphorus and iron in available form.

Quality of muskmelon is mainly attributed to the sugar content, flavour and texture of the flesh. Though a large number of varieties differing in shape and size are under cultivation in different parts of the country, hardly any of them is known to possess all the above quality characters. After a thorough screening and selection, the Gujarat Agricultural University, Anand Campus, Anand has been able to evolve a new variety, named 'Gujarat Muskmelon-1'.

Muskmelon is mainly grown on light sandy soils, mostly in river beds which are low in inherent nutrient status. At present it receives nutrients, mainly from bulky organic manures. The information available on requirement of fertilizers for muskmelon for this area is scanty. Under these circumstances fertilization of muskmelon with inorganic sources opens a new era for increasing its production potential.

Randhawa and Kirtisingh (1971), Gupta, Sharma and Shukla (1975), Ramasamy and Prasad, .(1975), Jassal, Nandpuri and Randhawa (1972), as well as Samarsingh Chundawat and Shekhawat (1976) reported that the crop of muskmelon responds well to the application of nitrogen, phosphorus and potassic fertilizers. However, the information regarding the requirements of NP on muskmelon has not been investigated in Gujarat. Hence, the present investigation was planned to ascertain the suitable dose of nitrogen and phosphorus for muskmelon, Var, GMM-1, under the soils and climatic condition of the middle Gujarat.

MATERIALS AND METHODS

A field trial was conducted for two years in 1977 and 1978 at the college Agronomy Farm, Gujarat Agricultural University, Anand Campus, Anand in summer. The soil was sandy loam locally known as "Goradu" having pH value of 8.2, organic matter content 0.47%, total Nitrogen 0.03%, 5M $NaHCO_3$ soluble phosphorus 50 kg/ha and exchangeable potash 350 kg/ha. The treatments consisted of 12 different combinations of four levels of nitrogen (80, 120, 160 and 200 kg/ha) and three levels of phosphorus (40, 60 and 80 kg/ha). F. Y. M. @ 10 tonnes/ha was given at the time of preparation of land. Entire quantity of phsophorus and potash @ 60 kg/ha as common dose to all the experimental plots and half the quantity of nitrogen was applied at sowing. The remaining half quantity of nitrogen was applied in two equal splits; first at one month after sowing and second at the time of flowering.

TABLE 1

Effect of different levels of nitrogen and phosphorus on the fruit yield of muskmelon Var. GMM-I.

Sr. No.	*Treatmen*	*Fruit yield tonnes/ha*			*Average length of fruit (cm)*		*Average girth of fruit (cm)*		*No. of fruits/ plot*		*Mean —CBR*
		1977	*1978*	*Pooled*	*1977*	*1978*	*1977*	*1978*	*1977*	*1978*	
	Fertility levels										
1	N 80 P 40	15.1	14.9	15.0	19.8	19.9	27.2	28.6	88.0	83.0	1:2.19
2	N 80 P 60	11.9	14.6	13.3	19.2	19.6	25.6	28.0	75.0	78.0	1:1.91
3	N 80 P 80	12.1	10.5	11.3	19.3	19.1	26.1	27.7	77.0	59.0	1:1.57
4	N 120 P 40	13.2	10.5	11.9	19.2	19.7	24.8	28.5	77.0	61.0	1:1.71
5	N 120 P 60	14.2	10.4	12.3	19.1	18.5	26.6	27.1	81.0	65.0	1:1.73
6	N 120 P 80	13.7	10.0	11.9	19.6	18.1	26.2	27.1	80.0	62.0	1:1.65
7	N 160 P 40	14.8	12.3	13.4	19.7	20.8	27.1	28.6	95.0	62.0	1:1.76
8	N 160 P 60	13.8	14.2	14.0	19.6	18.9	26.9	27.8	82.0	81.0	1-1.82
9	N 160 P 80	14.0	13.1	13.5	19.8	19.8	27.1	27.9	82.0	73.0	1:1.72
10	N 200 P 40	10.1	12.1	11.1	19.5	19.9	26.9	28.5	75.0	63.0	1:1.42
11	N 200 P 60	13.5	10.6	12.0	19.8	19.8	27.2	27.9	83.0	60.0	1:1.51
12	N 200 P 80	13.6	12.1	12.8	19.5	19.6	26.7	27.5	85.0	69.0	1:1.73
	SEm	0.3	0.7	0.9	0.8	0.6	0.5	0.8	1.8	5.0	—
	C. D. 5%	N.S.	1.7	2.7	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	—

	1	2	3	4	5	6	7	8	9	10
Mean for nitrogen										
N 80	13.0	13.4	13.2	19.4	19.5	25.6	27.9	80.0	70.0	1:1.89
N 120	13.7	10.3	12.0	19.3	18.8	25.9	27.2	79.5	63.0	1:1.69
N 160	14.4	13.2	13.8	19.7	19.9	27.0	28.1	86.2	72.0	1:1.76
N 200	12.4	11.6	12.0	19.6	19.7	26.8	27.9	81.0	64.0	1:1.55
SEm	0.8	0.5	0.3	0.6	0.4	0.5	0.6	0.8	3.5	—
C. D. 5%	N.S.	1.4	1.2	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	—
Mean for phosphorus										
P 40	13.4	12.5	12.9	19.6	26.0	20.0	28.4	84.0	65.0	1:1.77
P 60	13.3	12.4	12.8	19.4	26.6	19.3	27.7	80.2	71.0	1:1.74
P 80	13.3	11.4	12.4	19.5	26.5	19.1	27.3	80.9	66.0	1:1.66
SEm	0.6	0.8	0.6	0.5	0.5	0.3	0.5	3.8	3.1	—
C.D. 5%	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	—
Interaction N x P										
SEm	1.3	0.8	1.2	0.3	0.8	0.7	1.1	7.6	6.2	—
C.D. 5%	N.S.	2.5	2.2	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	—
C. V. %	16.93	11.68	18.58	2.66	5.92	5.24	6.40	20.70	28.00	—

The experiment was planned in randomised block design with four replications. The net plot size was 7.2 x 4.2 m². Seeds were dibbled in trenches opened 1.8 m apart with 0.6 m spacing between two dibbles on 25th January, 1977 and 4th February, 1978. In all seven irrigations were given each year.

RESULTS AND DISCUSSION

Effect of Nitrogen:

The results of the experiment revealed that the increase in fruit yield due to nitrogen was statistically significant during the year 1978 and in pooled analysis. Among the different doses, application of 80 kg nitrogen per ha was significantly superior over 120 kg nitrogen per ha. However, it was at par with 160 kg nitrogen per ha in pooled analysis. The trend was similar in the year 1977, however, the results were non-significant in the year 1977. This was due to cloudy weather prevailing throughout the month of February 1977.

Effect of Phosphorus:

The results of 1977 and 1978 indicated that the phospnorus application was non-significant.

The interaction effect of nitrogen x phosphorus was significant for the year

1978 and in the pooled analysis. The increase in fruit yield was probably due to increased number of fruits per plot, average girth and average length of fruit. However, all these characters were statistically non-significant, but the trend was in the favour of 80 kg nitrogen and 40 kg phosphorus per ha, for increasing the fruit yield. The above results were in confirmity with Gupta *et al.* (1975), Jassal *et al.* (1972), and Samarshing *et al.* (1976).

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