

## RESPONSE OF WATERMELON VARIETY SUGAR BABY TO NPK FERTILIZERS

**E**valuation of watermelon cultivars at the College of Horticulture, Vellanikkara, Trichur showed Sugar Baby as the best cultivar as far as yield and TSS are concerned. The optimum dose of fertilizers required for its cultivation has not been standardised. The adhoc recommendation of the Kerala Agricultural University (1986) is 75 kg N, 25 kg  $P_2O_5$  and 25 kg  $K_2O/ha$  which is common to all cucurbits. The fertilizers recommended by the Tamil Nadu Agricultural University for watermelon are 55 kg each of N,  $P_2O_5$  and  $K_2O/ha$  and that by the University of Agricultural Sciences, Bangalore is 100 kg N, 88 kg  $P_2O_5$  and 100 kg  $K_2O/ha$  (Tandon, 1987). In order to standardise the optimum and economic dose of fertilizers for watermelon a study was undertaken using the cultivar, Sugar Baby.

The present experiment was conducted at the College of Horticulture, Vellanikkara for three consecutive periods viz., January-April 1987, December 1987 to March 1988 and November 1988 to February 1989. The soil was well drained sandy clay loam with moderate fertility. It contained on an average 0.827% organic carbon, 0.072% available N, 0.001% available P and 0.006% available K, with a pH of 5.1. All the possible twelve combinations of three levels of nitrogen (0, 50 and 100 kg/ha) two levels of phosphorus (0 and 60 kg  $P_2O_5/ha$ ) and two levels of potassium (0 and 60 kg  $K_2O/ha$ ) were tried in this experiment in a factorial randomised block design. The plants were grown in channels of 1.50 m in length taken at 3.0 m spacing. There were four plants/channel/treatment/replication. Half dose of N and  $K_2O$  and full dose

of  $P_2O_5$  were applied as basal and the remaining N and  $K_2O$  were applied in two equal splits at vining and flowering stages of the crop. Observations were recorded on total yield and other characteristics of fruits.

Mean yield and fruit characteristics observed and the details of statistical analysis are furnished in Tables 1, 2 and 3. The various nutrient levels had significant influence on fruit yield (Table 1). Total fruit yield was significantly influenced by the main effect of N (December 1987 and November 1988 seasons), main effect of  $K_2O$  (January 1987 and November 1988 seasons) and N x P and P x K interactions. Direct influence of  $P_2O_5$  and other interactions were not significant. In December 1987 and November 1988 seasons, the main effect of  $n_1$  and  $n_2$  were on par with each other and were significantly superior to  $n_0$ . In January 1987 and November 1988 seasons, effect of  $k_1$  on yield was significantly superior to that of  $k_0$ . Pooled analysis also showed significant effect of the treatments on yield and there was no significant season x treatment interaction. The highest yield was obtained from  $n_1p_1$  (12.79 kg), which was on par with  $n_1p_1k_1$  (11.88 kg),  $n_2p_0k_1$  (11.66 kg) and  $n_2p_1k_1$  (11.53 kg). The effect of  $P_2O_5$  was not significant in pooled analysis also. This may be due to the high  $P_2O_5$  content of soil. Considering the four high yielded treatments, which were on par with each other,  $n_1p_0k_1$  (50 kg N and 60 kg  $K_2O/ha$ ) would be economical. Fertilizer trial conducted by Rajendran (1981) for pumpkin at Vellanikkara also showed that the maximum yield was obtained from  $n_1k_2$  (50 kg N + 50 kg  $K_2O/ha$ ).

Table 1. Fruit yield (kg/4.5 m<sup>2</sup>) as affected by fertilizer treatments

Treatments (1)	January 1987 (2)	December 1987 (3)	November 1988 (4)	Pooled mean (5)
$n_0P_0k_0$	3.83	2.71	8.70	6.75
$n_0P_0k_1$	12.87	0.75	10.19	7.94
$n_0P_1k_0$	13.91	0.41	5.14	6.49
$n_0P_1k_1$	14.30	2.48	11.74	9.50
$n_1P_0k_0$	11.89	4.19	6.89	7.65
$n_1P_0k_1$	15.99	7.63	14.75	12.79
$n_1P_1k_0$	9.29	8.85	11.16	9.77
$n_1P_1k_1$	12.20	9.74	13.70	11.88
$n_2P_0k_0$	9.40	9.68	11.64	10.24
$n_2P_0k_1$	17.52	5.76	11.69	11.66
$n_2P_1k_0$	11.05	7.38	11.09	9.84
$n_2P_1k_1$	13.85	7.65	13.07	11.53
CD (0.05)				
n	NS	3.31"	2.56*	
p	NS	NS	NS	
np	2.65"	NS	NS	
k	1.53"	NS	2.81**	
nk	NS	NS	NS	
pk	2.16"	NS	NS	
npk	NS	NS	NS	

NS : Not significant

\* : Significant at 5% level

\*\* : Significant at 1% level

Analysis of data on fruits/plot during December 1987 and November 1988 showed significant influence of nitrogen during the first season (Table 2). Other elements and their interactions had no significant effect on fruit number. The pooled analysis showed significant differences in fruits/plot due to various treatments. The maximum fruits (4.88) was obtained from plots of  $n_1P_0k_1$ ,  $n_1P_1k_1$  and  $n_2P_0k_1$ . It was minimum for plots receiving  $n_0P_1k_0$  (2.50), all other treatments were on par with

each other. The reduction in fruits under low nutrient levels has been reported in long melon (Raychoudhari *et al.*, 1982) and in oriental pickling melon (Lissamma, 1985).

The direct influence of nitrogen and NPK interactions were significant on the average fruit weight and TSS (Table 3). The fruit size in terms of average weight was also influenced directly by K. The effects of  $n_1$  and  $n_2$  were on par and significantly superior

Table 2. Fruits/plant as affected by fertilizer treatments

Treatments	December 1987	November 1988
Main effects		
$n_0$	1.62	4.56
$n_1$	3.87	4.63
$n_2$	3.44	5.50
$P_0$	3.04	4.79
$P_1$	2.92	5.00
$k_0$	2.92	4.54
$k_1$	3.04	5.25
CD (0.05)		
$n$	1.53**	NS

NS : Not significant

\* : Significant at 5% level

\*\* : Significant at 1% level

Table 3. Average fruit weight and TSS as affected by fertilizer treatments

Treatments	Average weight (kg)	Mean TSS (* )
Main effects		
$n_0$	1.98	7.48
$n_1$	2.60	8.33
$n_2$	2.20	8.04
$P_0$	2.28	7.90
$P_1$	2.24	8.01
$k_0$	2.06	7.91
$k_1$	2.47	7.99
CD (0.05)		
$n$	0.54**	0.61*
$P$	NS	NS
$np$	NS	NS
$k$	0.33*	NS
$nk$	NS	NS
$Pk$	NS	NS
$npk$	0.80*	1.23*

NS : Not significant

\* : Significant at 5% level

\*\* : Significant at 1% level

to  $n_0$ . Similarly  $k_1$  produced bigger (2.47 kg) fruits than  $k_0$  (2.06 kg). The positive influence of higher dose of N and  $K_2O$  on average weight of fruits has been reported by Raychoudhari *et al.* (1982) in long melon. The highest fruits were produced by  $n_1p_0k_1$  (3.07 kg), followed by  $n_1p_1k_1$  (2.64 kg). The TSS of fruits was maximum for fruits of  $n_1p_1k_0$  (9.42),  $n_1p_0k_1$  (8.42) and  $n_2p_1k_1$  (8.29). The nitrogen levels influenced the TSS. Effects of  $n_1$  and  $n_2$  were on par with and it was significantly higher than  $n_0$ .

Considering yield, number of fruits and TSS, a fertilizer dose of 50 kg N and 60 kg  $K_2O$  is recommended for watermelon under Vellanikkara conditions.

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