

RESPONSE OF NENDRAN BANANA TO DIFFERENT LEVELS OF N, P AND K

G. R. PILLAI, S. BALAKRISHNAN, P. G. VEERARAGHAVAN,
G. SANTHAKUMARI and R. GOPALAKRISHNAN

Kerala Agricultural University, Mannuthy, Kerala.

Nendran the popular commercial variety of banana occupies nearly 30 per cent of the area under banana in Kerala. Being a heavy feeder, heavy fertilisation becomes necessary for getting good yields. It is estimated that an average crop removes 300 kg N, 80 kg P_2O_5 and 800 kg K_2O from a h t of land (Veeraraghavan, 1972). Even an inherently fertile soil gets depleted of fertility within a few years. A stable cultivation at a satisfactory level of productivity can only be attained by adequate fertilisation (Simmonds, 1966). Though soil analysis will provide a guide to manurial practices, the indications are only approximate and the establishment of economic levels of fertilisation depends mainly on experimentation. Veeraraghavan (1972) reported significant increase in number and weight of fruits in Nendran banana with the application of 8:8:16 fertiliser mixture to supply 228 g. N, 228 g. P_2O_5 and 456 g K_2O plant per year. No systematic work has so far been done to study the response of Nendran banana to different levels of N, P and K and to work out the optimum dose of fertilisers under Kerala conditions. Hence a study in this direction was undertaken at the Banana & Pineapple Research Station, Kannara in the year 1963-54 and was conducted for 5 consecutive seasons.

Materials and Methods

The soil was lateritic loam containing on an average 0.51% organic

the effects of N, P and K at three levels each. The levels of nutrients tried were 0, 114 and 228 g of N and P_2O_5 and 0, 228 and 456g of K_2O per plant per year. Nitrogen, phosphorus and potash were applied as ammonium sulphate, super phosphate and muriate of potash respectively, in two equal split doses at 70-80 days and 110-120 days after planting. The test variety was nedunendran a popular local variety with a duration of 10 to 11 months. Three to four month old sword suckers were planted at a spacing of 2m x 2m during September-October. Cultural operations, irrigation and plant protection were adopted as per the recommended package of practices.

Results and Discussion

Number of fruits: The mean data on the number of fruits per bunch (Table 1) show that the effects due to N and K are highly significant. Though the treatment effect between 114 g of nitrogen and 228 g of nitrogen was not significant, there was an appreciable increase in fruit number beyond 114 g level. In the case of K, the increase in fruit number was significant only upto 228 g level and beyond that there was only a slight increase in fruit number. Though not significant the effect due to P was positive upto 114 g level and it showed a declining trend beyond that level. Thus among the three nutrients, N has exhibited a more pronounced influence on the number of fruits per bunch.

Table 1.
Mean Dumber of fruits per bunch of **Nendran** banana under
different levels of **N P K**.

Level of nutrients (g per plant)	1963-64	1954-65	1965-66	1966-67	1967-68	Mean
NO	41.3	47.3	50.5	51.6	42.3	46.6
N 114	47.0	52.4	58.2	58.3	42.1	51.8
N 228	52.7	52.7	59.7	59.3	46.4	54.1
PO	44.4	45.9	56.2	54.9	44.9	49.3
r 114	50.3	55.9	55.0	56.7	42.6	52.1
P 228	46.3	50.5	57.2	57.5	44.3	51.2
KG	43.9	41.8	54.8	55.4	44.9	48.2
K 228	49.4	53.4	57.2	57.7	42.6	52.1
K 456	47.6	57.0	56.4	56.2	44.3	52.3
C D (0.05)	6.4	3.61	3.01	2.66	N.S	3.14

Bunch weight: The effects due to N and K are significant on bunch weight (Table 2). The mean increase in bunch weight at 114 g level of N was 13 g per gram of N and beyond that the increase in bunch weight was negligible. Thus the increase in fruit number obtained beyond 114 g N is at the expense of the bunch weight.

Potash exerted a positive significant influence on bunch weight upto 228 g level but beyond that it declined. The trend in fruit number was also more or less similar with only a negligible increase beyond 228 g level. Eventhough

the potash status of the soil was low, lack of response noticed beyond 228 g level can be attributed to the peculiar nature of availability of the nutrient. According to Simmonds (1966) the availability of potash is influenced by different factors and of all the elements potash is required in greatest amount by banana plant. Soil analysis can be deceptive for this element as is well known, its uptake may be markedly affected by other soil characteristics.

Table 2

Mean bunch weight (kg) of Nendran banana under different levels of N P K

Level of nutrients (g per plant)	1963-64	1964-65	1965-66	1966-67	1967-63	Mean
NO	6.30	6.67	9.59	8.38	7.96	7.96
N 114	8.24	8.78	10.92	10.41	8.94	9.46
N 228	8.68	8.99	11.28	10.42	9.22	9.72
PO	7.06	7.76	10.39	9.59	8.88	8.74
P 114	8.14	8.23	10.39	9.92	8.68	9.07
P 228	8.00	8.27	11.00	10.18	8.97	9.28
K 0	6.21	6.62	10.38	9.71		8.34
K 228	8.71	9.07	10.97	10.10	8.73	9.49
K 456	8.30	8.57	10.45	9.87	9.19	9.28
CO (0.05)	1.29	1.10	0.69	0.60	0.74	0.56

Response on bunch weight due to P was not significant during any of the 5 years. Eventhough the P status of the soil was low the response due to P was not significant. Simmonds (1966) has also reported that manurial trial in banana soils in general fail to give response to P even when it is apparently short.

The effects due to interaction of nutrients were not significant. The results clearly showed among **three** nutrients viz. N, P and K, nitrogen was more important both for the production of more number of fruits and for increasing the bunch weight. Croucher and Nitchell (1940) had reported that nitrogen was always the first nutrient to which banana responded.

The response to N and K levels, as indicated by second order polynomial equation ($Y = ax^2 + Bx + c$) drawn for bunch weight is presented (Fig. 1). The optimum doses of N and K giving the maximum yield work out to be 191 g N and 301 g K_2O per plant per year. The levels giving the maximum profit work out to be 133 g and 260 g of N and K_2O respectively per plant at a price of Rs. 1.30 per kg. of fruit and Rs. 6/— and Rs. 2 - per kg. of N and K_2O respectively.

Summary

Experiments were conducted to study the response of nendran banana to different levels of N, P and K at the Banana & Pineapple Research Station, Kannara for five consecutive seasons from 1963 — 64. The results revealed that the nutrients N and K exerted a significant positive influence on fruit number and bunch weight. The optimum dose of N and K_2O corresponding to maximum yield of fruit has been worked out as 191, and 301 g per plant respectively. The economic optimum dose according to the prevailing market rate has been worked out as 133 and 260 g of N and K_2O respectively per plant per year.

ശ്രീ, ഫോസഫറസ്, പൊട്ടാഷ്

കുറഞ്ഞ പ്രതികരണങ്ങൾ മനസ്സിലാക്കുവാൻ 1963 — 64 മുതൽ തുടർച്ചയായി അഞ്ചു കാലം കണ്ണൂരിലുള്ള വാഴ ffisiAroi-gj'i ഗവേഷണ

നൽകേണ്ടതാണെന്നു തെളിഞ്ഞു. എന്നാൽ വളത്തിന്റെ, ഒര

രൂപം (raia)3DC!Dtft>faaioQE)വിളവു

133 ഗ്രാമം, 260 ഗ്രാമം തോതിൽ $ro\ll5?>(s<0)6rrs\llno6no^u$.

REFERENCES

- Croucher, H. H. and Mitchell, W. K. 1940. Fertiliser Investigations with the "Cros Michel" banana. *Dep. Sci. Agric. Bull. Jamaica*, **19**, 30.
- Simmonds, N. W. 1966. *Planting and management, Bananas*, second edition (Tropical Agriculture series) 156-204.
- Veeraraghavan, P. G. 1972. Manurial-cum-liming experiment on Nendran banana. *Agric. Res. J. Kerala* **10**, 116-118.

(M. S. received: 20-3-1977)

RESPONSE OF NENDRAN BANANA TO N, P AND K.

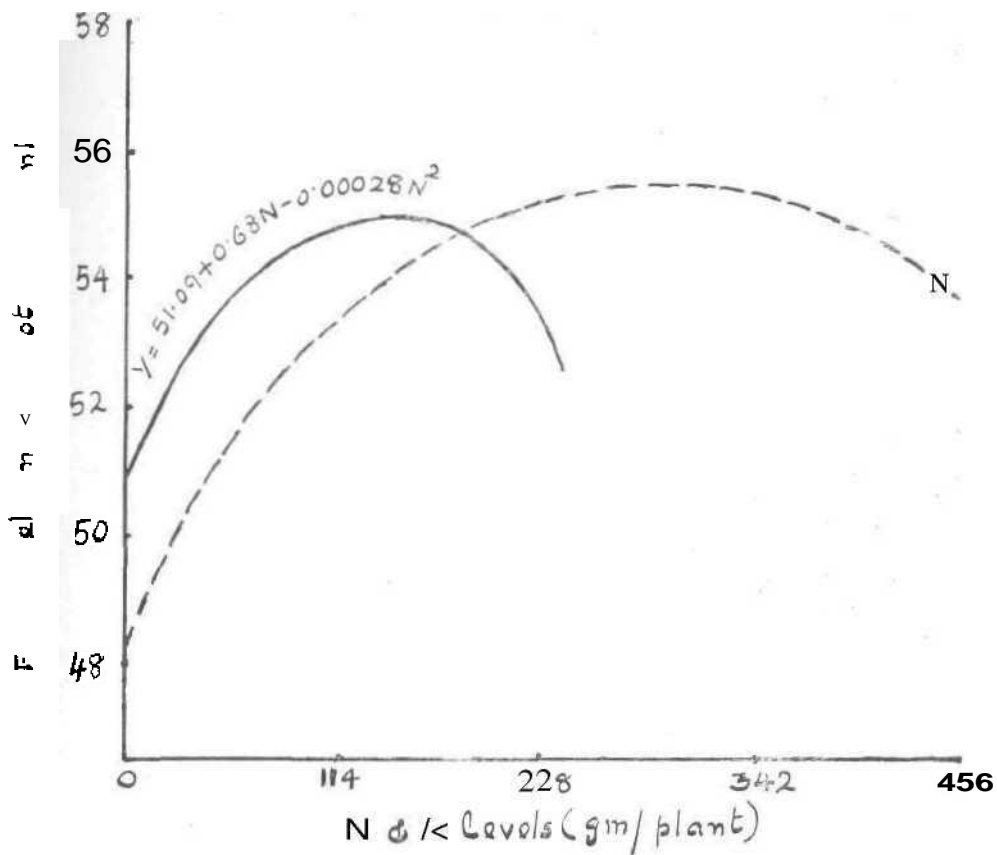


Fig. 1. Response of Nendran banana to N & K