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<https://doi.org/10.29321/MAJ.10.A03649>

Response of Rice to Fertilizer Application in Cultivators' Fields in Tamil Nadu

by

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Introduction: Indian soils are known to be deficient particularly in N, but believed to contain large reserves of P and K. This belief was based on the results of numerous trials conducted at the Research Stations where negligible responses to phosphate and potash applications were obtained. The Research Stations, however, are likely to be not quite representative of the tract not merely because of their small number but because of the continued manuring and better managerial practices over a number of years which is not a feature of an average cultivator's field. The need for trials on cultivators' fields has been increasingly felt on the recognition that recommendations based on the results of such trials alone could be reliably passed on for adoption by cultivators in a given tract. A series of simple fertilizer trials were therefore, laid out in cultivators' fields since 1951. From the results

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of trials conducted during 1958-59 to 1961-62, it was observed that not much difference in responses existed to the different sources of N viz., Ammonium sulphate, Ammonium sulphate nitrate, Urea and Calcium ammonium nitrate. It was also seen that economic response to phosphate and potash existed in many selected pockets all over the country. Accordingly, the programme of trials was revised with effect from 1962-63 in order to study more critically the response curves of N, P and K alone and in combination and response surfaces of two or more nutrients.

Materials and Methods: The trials considered here were conducted in 1962-63 in all districts of Tamil Nadu. But the data on rice crop in Thanjavur and South Arcot districts only were taken up for the present study, because the bulk of the experiments were laid out in these two districts. Results of a total number of 122 experiments of three types of trials viz., A I, A II and A III were studied.

The experimental treatments in the trials were as follows:

Type A (I): O, N₁, N₂, P₁, N₁P₁, N₂P₁, N₂P₂, N₂P₂K₁

Type A (II): O, N₁, P₁, P₂, N₁P₁, N₁P₂, N₂P₂, N₂P₂K₂

Type A (III): O, N₁, K₁, K₂, N₁K₁, N₁K₂, N₂K₂, N₁P₁K

The nutrients were applied each at 0, 30 and 60 lb/acre represented respectively by symbols 0, 1 and 2. N was applied as ammonium sulphate, P as single super phosphate and K as muriate of potash.

The trials were conducted in both the districts in cultivators' fields selected at random from among the rice growing cultivators of each selected village. For this purpose each district was divided into four homogeneous zones based on geographical continuity, climate, cropping pattern *etc.*, From each zone, one centre representing about 100 villages was selected at random, such that, the area included corresponded to a revenue administrative unit such as the Revenue Division or Circle. For the trials considered here, Pattukottai, Nagapattinam, Mayuram and Papanasam were the four selected centres in Thanjavur district; Cuddalore, Villupuram, Virudachalam and Tirukoilur formed the centres selected in South Arcot district. Three villages were randomly selected from among those covered by each of the centres for conducting experiments on rice and in each selected village, three cultivators were selected at random from among the rice growing cultivators. The three types of trials A I, A II and A III were conducted in the three selected cultivators' fields in each of the selected villages on the rice crop.

The trials in the Thanjavur district were conducted in three distinct seasons viz., *Kuruvai* (May to October), *Thaladi* (October to February) and *Samba* (July to February). In South Arcot district, the trials conducted in