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Research Note :

STANDARDIZATION OF SOIL SAMPLING METHOD IN ARECANUT : PART II A PROCEDURE TO SECURE HOMOGENEOUS COMPOSITE SAMPLE

Soil testing is an important diagnostic aid in evaluating the fertilizer response to crops. The results of soil analysis are useful only when errors introduced through the methods of soil sampling, sub-sampling and analytical procedures are kept at their minimum. Out of all the above factors involved, collection of a sample representative of a particular area is the most challenging task in soil which is nothing but a complex and heterogeneous body. This again should take into consideration the kind of crop, its rooting habit, manurial and cultural practices adopted. The entire aspect of soil sampling has been dealt by Jackson (3).

In arecanut, manuring and fertilization are done to the basin of approximately 75 cm diameter around the palm which includes the maximum root coverage to a depth of 50 cm (1). Thus, there remains two distinct zones, one the basin which is fertilized and irrigated and other the area lying out of it. In soil fertility problems, it is very much necessary to collect a sample that should represent this cylindrical volume of fertilized soil where about 70 per cent of roots absorb water and nutrients. The authors in an earlier study (2) observed considerable variations existing between soil samples collected at 30, 70 and 100 cm distances from base of the palm in their fertility constituents. The present investigation was therefore initiated to evolve a suitable method of soil sampling in arecanut which should give least variation between the composite samples prepared by mixing a definite number of cores drawn from the area of maximum root activity. The results obtained are included in this note.

Fifteen palms from $N_2P_2K_2G_1$ treatment plot of the NPK manurial experiment laid out at the Institute's farm were selected for the study. The information regarding the treatment details are given elsewhere (2). In the present case, each basin was tentatively divided into four quadrants. Soil samples were collected at 30, 60 and 90 cm lateral distances upto a depth of 50 cm from each quadrant. The details of the methodology employed are given below :

1. Three cores taken at 30, 60 and 90 cm lateral spots from one quadrant and made to one composite sample.

2. Six cores taken from two quadrants, three from each at 30, 60 and 90 cm lateral distances and made to one composite sample.

3. Nine cores taken from three quadrants, three from each at 30, 60 and 90 cm lateral distances and made to one composite sample.

4. Twelve cores taken from four quadrants, three from each at 30, 60 and 90 cm lateral distances and made to one composite sample.

The composite soil samples collected were air dried, pounded, screened through 2 mm sieve and analysed for pH, organic carbon, available nitrogen, phosphorus and potassium. Conventional methods for analysis were employed for the estimation of all these nutrients (3). 'F' test was employed in order to draw inferences from the data.

The results pertaining to the available nutrient contents of samples and pH are given in Table. A perusal of the data brings out no significant differences between different methods of soil sampling for any of these constituents studied. In other words, it means that a three core composite sample drawn from an area of 90 cm radius of palm represents the fertility status of the basin for available plant nutrients.

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TABLE : Fertility constituents of soil as affected by different methods of sampling.

Sampling method	pH	Organic carbon (%)	Available constituents (ppm) N	P_2O_5	K_2O
3 cores from 1 quadrant	4.89	1.21	116.66	42.48	78.13
6 cores from 2 quadrants	4.78	1.21	119.06	41.56	60.33
9 cores from 3 quadrants	4.80	1.26	119.00	42.42	64.80
12 cores from 4 quadrants	4.77	1.24	120.93	44.20	68.47
	NS	NS	NS	NS	NS

NS; Not significant.