Abstract

Detailed soil survey of Pudukode panchayat (1629 ha) was undertaken as a part of the centrally sponsored scheme, RSVY to prepare an inventory of the soil, land and water resources of the panchayat and for assessing soil fertility to refine the current general fertilizer recommendations for enhancing the productivity of paddy.

During detailed soil survey three soil series Gayathri, Kuthanur and Tolanur were identified in low lands which are mainly cultivated with paddy. The upland soil series Oravumada, Kummankuzhi and Karinganthode are mainly cultivated with coconut, rubber and tapioca. Considerable area under paddy have been converted for garden land crops and for non agricultural purposes. From survey it is evident that nearly 80 per cent of the land is good for the cultivation of crops and rest of the area is moderately to fairly good for cultivation. More than 90 per cent of the land is suitable for irrigation. By adopting good crop management practices the present level of yield of the crops can be increased to a considerable extent.

The soil mapping units representing different phases of soil series individual mapping units are identified. Systematic collection of surface samples were done from each land parcels and these samples were subjected to detailed analysis for macro and micro nutrients and other soil properties which directly affect the plant growth. The results were systematically arranged in this report and detailed descriptions of each management units are given with specific recommendations based on soil fertility analysis. Various interpretative maps are also prepared for easy understanding. The soils identified in the panchayat are classified as per the USDA Soil Taxonomic Classification System which enables information exchange and better understanding of soils.

The soil reaction, electrical conductivity and content of available macronutrients were determined for the composite surface samples from each land parcel. Nearly a third of the samples collected from land parcels in the upland region were strongly acidic in reaction and nearly one fourth of the
samples were moderately acidic. The remaining samples showed a wide range in pH from extremely acidic to slightly alkaline. The strong to moderately acidic soils require liming to neutralize acidity. The soil fertility map provides lime requirement for each parcel of land.

Majority of the samples collected from uplands were low in available Nitrogen and Potassium which is indicative of deficiency of both these primary mineral nutrients. Nearly 69 per cent of the samples were low in nitrogen, 39 per cent was low in phosphorus and 62 per cent of the samples were low in potassium. In land parcels testing low for primary mineral nutrients it is desirable to apply these nutrients at 125 per cent of the recommended dosage. In areas testing medium, the full recommended dose is to be applied and in areas testing high only 60 per cent of the recommended dosage need be applied. About 80 per cent of the samples tested adequate for Zinc and 96 per cent of the samples tested adequate for Copper. Since the land parcels are generally adequate in Zinc and Copper, external application of these micronutrients is not warranted.

Thirty per cent of the samples were strongly acidic in reaction. The remaining samples were mostly very strongly acidic and moderately acidic. These soils require liming.

Adequate quantities of organic matter should also be ensured. Nitrogen status of the soil can be enhanced by cultivation of leguminous green manure crops. In dry sown rice, cowpea seeds may be sown at the rate of 12.5 kg/ha and incorporated into the soil at flowering stage. Green manure crops like Dhaincha may be sown after pre monsoon showers and subsequently incorporated into the soil. This practice is widely prevalent in Palakkad district and needs to be encouraged by supplying seeds and planting material of green manure crops at subsidized rates. Methods may be adopted to improve fertilizer use efficiency. Methods to reduce loss of nitrogen through volatalisation, leaching and nitrification may be popularized. To reduce loss of Nitrogen, it may be incorporated well with soil in basal dose application. To reduce leaching loss of nitrogen from fertilizers like urea during top dress, it
may be mixed thoroughly with about six times the quantity of soil and kept for 24 hours before sowing. To reduce nitrification loss, fertilizers like urea may be mixed well with powdered neem cake in the ratio 1:5 and applied. Copper and zinc was found to be adequate in most samples hence external input of these nutrients is not necessary. However in land parcels showing deficit values for these nutrients, foliar application of these nutrients is recommended. As a cheaper alternative for foliar application seed dip of these micronutrients is recommended. The recommendation for zinc is dipping for 24 hours before sowing in 1% zinc sulphate solution @ 1 litre of micronutrient solution /kg of seeds and that for copper is dipping the seeds for 24 hours in 0.25% Copper sulphate solution @ 1 litre/kg of seeds.

Information on the level of plant nutrients may be gathered from the soil fertility map and the nutrients may be applied to crops. The organic matter status of the soil may be enhanced by return of crop residues to the soil, raising green manure crops and ploughing them in and regularly adding farmyard manure and or compost.