Abstract

Detailed soil survey of Puthupariyaram panchayat (2958 ha) was undertaken as part of the centrally sponsored scheme, RSVY to prepare an inventory of the soil, land and water resources of the panchayat. The soil perspective and its role in improving agricultural production and productivity are given special stress during the survey.

Six soil series in uplands and three soil series in wetlands were identified during the survey. The soil mapping units representing varying phases of the soil were 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 are 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.

Composite surface soil samples were collected from individual land parcels and analysed for soil reaction, available micro and micro nutrients and for various other parameters affecting normal plant growth. Nearly 891 samples were analysed for evaluating surface soil fertility.

460 composite surface samples were collected from different soil series in the uplands for detailed analysis. The surface samples showed wide range of soil acidity. Nearly 2 per cent of the samples were very strongly acid, 13 per cent strongly acid, 53 per cent moderately acid, 17 per cent slightly acid, 1 per cent moderately alkaline and the rests neutral in soil reaction. All the land parcels with moderate or high acidic ranges require liming. The availability of nitrogen was low in 39 per cent, medium in 59 per cent and high in rest of the samples. Nearly 12 per cent of the samples were low, 46 per cent medium and the rest high in the availability of phosphorus. About 76 per cent of the samples were low, 23 per cent medium and the rest high in available
potassium. Nearly 93 per cent in case of available zinc and 99 per cent in case of available copper were adequate and the remaining samples deficient in those nutrients. All the land parcels in the up land with low available NPK need to be treated with 125 per cent of the recommended dose and only 60 per cent is required if the availability is high. In land parcels with medium availability recommended dose should be applied. The land parcels with low available zinc and copper should be treated with foliar spray when these lands are put to cultivation.

431 samples from the wet lands were collected and tested. The surface samples showed vide range of soil acidity. Nearly 3 per cent of the samples were very strongly acid, 11 per cent strongly acid, 58 per cent moderately acid, 16 per cent slightly acid, 1 per cent slightly alkaline another 1 per cent moderately alkaline and the rest neutral in soil reaction. All the land parcels with moderate or high acidic ranges require liming. The availability of nitrogen was low in about 55 per cent, medium in 43 per cent and high in the rest. Nearly 14 per cent of the samples were low, 52 per cent medium and the rest high in the availability of phosphorus. About 83 per cent of the samples low, 16 per cent medium and the rest high in available potassium. Nearly 94 per cent in case of available zinc and 99 per cent in case of available copper were adequate and the rests were deficit in both cases. All the land parcels in the low land with low available NPK need to be treated with 125 per cent of the recommended dose and only 60 per cent is required if the availability is high. In land parcels with medium availability recommended dose should be applied. The land parcels with low available zinc and copper should be treated with foliar spray when cultivation is practiced.

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 12.5kg/hectare 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 volatilisation, 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 accordingly. 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.