Abstract

Detailed soil survey of Marutharod panchayat (1968 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 rice. The soil perspective and its role in improving agricultural production and productivity are given special stress during the survey.

Seven soil series were identified in the panchayat during the soil survey of the panchayat. Out of this four soil series Gayatri, Kuthanur, Nadukulam and Tolanur are identified in low lying lands which are mainly under paddy cultivation. The other three soil series Ozhalapathy, Perumkunnam and Padappanal are identified in uplands which are mainly cultivated with coconut, banana and fruit trees.

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.

For analyzing the major nutrients composite samples were collected from each land parcel. Nearly 33 per cent of the samples collected from land parcels in the upland region were moderately acid in reaction and nearly 25 per cent of the samples were strongly acid. The remaining samples showed a wide range in pH from extremely acid to neutral. The strong to moderately acid 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 nutrients. It is desirable to apply 125% of the recommended dosage of nitrogen and potassium for the crops. Phosphorus content was found to be low in thirty eight percent of the upland samples and medium in forty eight percent of the tested samples and the remaining samples tested high. In land parcels testing low for phosphorus, 125% of the recommended dosage of phosphorus may be applied and in areas testing medium only the recommended rates need to be applied. In areas with high phosphorus status the same may be applied at 60 per cent of the recommended dose.

About eighty per cent of the samples tested were adequate for zinc and ninety one percent of the samples tested were adequate for copper. Since the land parcels are generally adequate in zinc and copper, external application of these micronutrients is not warranted.

The soil samples collected and analysed from low lands gave the following result. Forty per cent of the samples were moderately acidic in reaction. The remaining samples were mostly strongly acidic and slightly acidic. These soils require liming.

Most of the soils collected from lowlands were low in nitrogen and potassium. Nearly 50 per cent of the samples collected were medium in phosphorus and 38 per cent were low and 12 per cent tested high. Adequate quantities of organic matter should 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 Daincha may be sown after premonsoon 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. All the land parcels with low available nitrogen, phosphorus and
potassium should be treated with 125 per cent of the recommended dose of the nutrients and 60 per cent of the nutrients need to be applied in land parcels having high available nitrogen, phosphorus and potassium. Only the recommended dose of nutrients need to be applied if the availability of nutrients are medium.

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 soil in the ratio 1:6 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 of seeds 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.