Abstract

Detailed soil survey of Ayiloor panchayat (4094 ha) in Chitoor taluk of Palakkad district was undertaken under Rashtriya Sam Vikas Yojana 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.

During the course of Survey 6 garden land and 3 wet land soil series were identified. The wetland soils are Kavassery, Tharur, and Vallangi series. These soils are extensively cultivated with paddy. Production potential of these soils can be maximized by assuring timely irrigation and integrated nutrient supply. The garden land soils identified in the panchayat are Arumboorapathy, Kanimangalam, Koduvalpara, Oravumada, Pezhumpyrara and Vittanasserry series. Arumboorapathy and Koduvalpara series are located adjoining to the foot hills of Nelliyampathy hills and are mainly cultivated with rubber. Coconut is the main crop in the rest of garden land soils. Vittanasserry series is occurring on riverbanks.

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 fertility status of the panchayat is as follows. Nearly 30 per cent of the samples collected from land parcels in the upland region were strongly acidic in reaction and nearly 24 per cent of the samples were moderately acidic. The remaining samples showed pH ranging from extremely acidic to slightly acid. The extremely acidic to moderately acidic soils require liming to neutralize acidity. The soil fertility map provides lime requirement for each parcel of land.

Majority of the surface soil samples collected from uplands were low in Nitrogen and Potassium, which is indicative of deficiency of both these primary nutrients. Nearly 79 percent of the samples were low in nitrogen, 22 percent was low in phosphorus and 41 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 % of the recommended dosage. In areas testing medium, the full recommended dosage is to be applied and in areas testing high only 60 % of the recommended dosage need be applied. About 23 per cent of the samples tested deficient for zinc and 4 percent of the samples tested deficient for copper.

Nearly 39 per cent of the samples collected from land parcels in the lowland region were strongly acidic in reaction and nearly 21 per cent of the samples were moderately acidic. The remaining samples showed pH ranging from extremely acidic to slightly acid. The extremely acidic to moderately acidic soils require liming to neutralize acidity. The soil fertility map provides lime requirement for each parcel of land.

Majority of the surface soil samples collected from lowlands were low in nitrogen phosphorus and potassium, which is indicative of deficiency of primary mineral nutrients. Nearly 84 percent of the samples were low in nitrogen, 71 percent was low in phosphorus and 93 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 % of the recommended dosage. In areas testing medium, the full recommended dosage is to be applied and in
areas testing high only 60 % of the recommended dosage need be applied. About 52 per cent of the samples tested deficient for zinc and 9 percent of the samples tested deficient for copper.

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 Dhaichna 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. 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 @ 1litre 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.