Abstract

Detailed soil survey of Mathur panchayat (2454 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. The soil perspective and its role in improving agricultural production and productivity are given special stress during the survey. Assessment of the soil fertility to refine the current fertilizer recommendation for enhancing the productivity of paddy was also envisaged under the scheme.

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. In general this report gives an account of complete soil and land resources of the panchayat and includes soil and other interpretative maps.

During detailed soil survey seven soil series were identified in the panchayat of which Pezhumpara series, Arumboorapathy, Perumkunnam and Palathura are the upland soils. These soils are cultivated to coconut, arecanut, ginger and banana. The lowland soils identified are Elavancheri, Kalapatti and Tolanur series and they are mostly under paddy. From the survey it is evident that nearly 50% of the land is good for cultivation of the crops and the rest is fairly good for cultivation. More than 65% of the area is suitable for irrigated agriculture. Fertilization as per the recommendation based on soil sample analysis and other timely and scientific management of crop cultivation will surely enhance the agricultural production of the area substantially.

Composite surface soil samples were collected from individual land parcels and analysed for soil reaction, available macro and micro nutrients and for various
other parameters affecting the normal plant growth. Nearly 1916 samples were analysed for evaluating surface soil fertility.

Nearly 1034 composite surface samples were collected from different soil series in the uplands for detailed analysis. The surface samples showed vide range of soil acidity from neutral to extremely acid reaction. All the land parcels with moderate or high acidity require liming. The availability of nitrogen was in general low to medium and phosphorous and potassium low to high. Most of the samples were adequate in available zinc and copper.

About 882 samples from the wet lands were collected for fertility analysis. The surface samples showed vide range of soil acidity from moderately acid to extremely acid reaction. All the land parcels with moderate or high acidity require liming. The availability of nitrogen, phosphorous and potassium was in general low to medium. The availability of Zn and Cu was adequate in most samples.

All the land parcels in the upland with low available N,P and K need to be treated with 125 per cent of the recommended dose of these nutrients 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 which show deficiency in available zinc and copper require foliar application of these micronutrients. Regular addition of organic matter will enhance production and improve the availability of these micro nutrients.

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. 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. Farm yard manure or composite should be added regularly in the soils to enhance the organic carbon contact of the soil.