

Contact Details of Principal Investigators of collaborating institutions

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GOVERNMENT OF KERALA

OVERVIEW OF THE PROJECT ON SOIL BASED PLANT NUTRIENT MANAGEMENT PLAN FOR AGRO-ECOSYSTEMS OF KERALA

Background

The State of Kerala falls in the humid tropical belt with high rainfall and temperature conditions conducive to intense weathering processes. Kerala has dominantly highly weathered lateritic soils which are acidic, kaolinitic, gravelly with low cation exchange capacity, low water holding capacity and high phosphorus fixation. Soils are inherently poor in bases and other plant nutrients. However, they are responsive to agronomic management. The continuous downward slide in crop production has been a matter of serious concern. Improving and maintaining soil fertility for productivity enhancement is of paramount importance in sustaining crop production.

The Kerala State Planning Board initiated a project on "Soil Based Plant Nutrient Management Plan for Agro-Ecosystems of Kerala" in 2010. The project implemented by the Department of Agriculture was organized as a multi-institutional Project of the State and Central institutions involved in agricultural research and development in the State under the leadership of NBSS & LUP, Bengaluru and co-ordinated by the Kerala State Planning Board. This leaflet briefly outlines the lessons learnt from the massive soil analysis data generated covering all the panchayats / agro-ecological zones of the State which will help in the development of management strategies with thrust on productivity, sustainability and environmental quality.

Project implementation

The project started in 2010 envisaged extensive collection of around 2 lakhs of surface soil samples from individual farmer's fields covering all the panchayats in the State. The samples were analysed for major, secondary and micro nutrients (13 parameters) utilising the facilities and expertise of 27 laboratories under the various collaborating institutions. The analytical data were uploaded to the central server located in the Agri informatics division of the Indian Institute of Information Technology and Management- Kerala (IIITM -K). Appropriate offline and online software have been developed by IIITM - K with the support of Kerala Agricultural University and NBSS & LUP, Bengaluru and other collaborating institutions in the project for data entry by the participating laboratories and for data interpretation and analysis, facilitating soil test based fertiliser recommendation for various crops for macro, secondary and micro nutrients. Soil health cards have been issued to the individual farmers covered under the project. The cards can also be accessed by individual farmers using the soil sample code by visiting www.keralasoilfertility.net. Agricultural officers of each panchayat/ Block/District and concerned scientists of the collaborating institutions can also access the nutrient management plan by logging on to the website.

Special features of the project

1. The multi-institutional collaboration brought together planners, research scientists, officers of the Department of Agriculture to address a serious concern of the State.
2. Testing of soils for secondary and micro-nutrients apart from macro nutrients
3. Extensive use of Information Communication Technology (ICT) for soil test data transmission, storage, analysis and automated processing to generate soil test advisories to farmers.
4. Re-organisation of the soil testing services in the State: revision of the soil testing manual and inclusion of the analysis soils for the secondary nutrients (calcium, magnesium and sulphur) and micro-nutrients (iron, manganese, copper, zinc and boron).
5. Initiation of a network research programme to evolve package of practices for secondary and micro nutrients for crops grown in the State

Nutrient management plan

The soil samples collected from the farmer's field in a panchayat form the basis for the preparation of area wise soil test summaries and fertiliser recommendations. Nutrient indices have been worked out for major nutrients N, P and K. Fertiliser recommendations are based on the frequency distribution of nutrient in the low, medium and high fertility classes. In respect of secondary and micro nutrients the frequency of the deficient/adequate classes decides the need for nutrient supplements. Fertiliser recommendation for various crops and guidelines for fertiliser use have been suggested.

Nutrient management plan assists the farmers in the proper choice and use of organic manures and fertilizers. Since the recommendations are soil test based, there is potential savings in input cost, balanced supply of nutrients based on the need of the crop and improved crop performance. Enhanced crop yield and quality with lesser environmental hazards due to excess of nutrients and improvement in soil health are added benefits. Nutrient management plans are being prepared for all the panchayats in the State and provides an overview of the fertility status of the panchayat. The panchayat nutrient management plans will be integrated to develop plans for the Block, District, and all the agro-ecological zones of the State.

Fertility constraints of Kerala soils - General trends based on soil analysis

- ★ Excessive use of high input acid forming fertilizers and near absence of the practice of liming has resulted in soil acidification to unacceptable levels.
- ★ Majority of the soils are strongly acid to moderately acid warranting regular application of lime
- ★ Available P is high in majority of the soils due to high input of phosphorus fertilizers
- ★ Magnesium deficiency is of wide occurrence
- ★ Zinc deficiency appears in limited areas
- ★ Boron deficiency is of wide occurrence

Interventions required

- ★ Regular liming practice based on pH to combat acidity and alleviate calcium deficiency
- ★ Reduction in P application to the extent of 50 per cent of the recommended POP dose
- ★ Magnesium sulphate /dolomite application to alleviate deficiency
- ★ Zinc sulphate application in soil or as foliar application
- ★ Borax application in soil or as foliar application

Way forward

A series of interventions are planned for addressing soil fertility issues as part of Kerala Soil Fertility Initiative of the Department of Agriculture. Modernisation of soil testing laboratories including mobile laboratories has been planned. Awareness programmes, panchayat adoption and field level demonstrations on secondary and micro nutrients in all the districts through DSTL, Mobile soil testing laboratories, ATMA, Krishi Bhavan are also planned. Agroecological unit wise interventions to address specific problems are also envisaged for implementation in 12th Five Year Plan of the State with the support of all stakeholders for improving crop production and income of farmers.

Contact Number of District Soil Testing laboratories

1.Thiruvananthapuram	04712533044
2.Kollam	04742797869
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7.Ernakulam	04842703976
8.Thrissur	04872320630
9.Palakkad	04662212091
10.Malappuram	04832731390
11.Kozhikode	04962600250
12.Wayanad	04935442499
13.Kannur	04602206812
14.Kasargode	04994227428