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Directorate of Agriculture,
Thiruvananthapuram,
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CIRCULAR

Sub:- Strengthening of selected Soil Testing Laboratories for Organic Manure Quality Analysis – reg.

Ref:- Arising.

The increased awareness on the quality of agricultural produce has increased the use of organic inputs. This change in the farming scenario has brought about a spurt in the production of organic manures especially compost by conversion of a wide variety of bio wastes on a commercial scale in large composting units. Wide variation is noticed in the quality and composition. Flooding of spurious products in the market is a stumbling block in ensuring the supply of good quality organic manures.

In order to ensure the quality of organic manures, quality testing facilities have to be set up across the State. This project is for the setting up facilities for organic manure quality analysis in 4 selected soil testing laboratories - District Soil Testing Laboratories Kottayam, Pathanamthitta, Kozhikkode and Central Soil and Plant Health Centre under Department of Agriculture.

An amount of **Rs.67.60 lakhs (Rupees Sixty Seven Lakhs and Sixty Thousand only)** required for implementation of this project will be met from the budget provision of Rs.1000.00 lakhs during 2015-16 under head of account **2401-00-105-85 (Plan)**.

Objectives

- Setting up of facilities for organic manure testing in 4 selected soil testing laboratories under Department of Agriculture.
- Ensuring quality control in organic manure sector .
- Ensuring that organic manures with nutrient content as specified in the package are available to the farming community.
- Supporting organic farming movement in the State.

Programme

The following soil testing laboratories under the Department of Agriculture will be strengthened for organic manure quality analysis.

- 1) Central Soil and Plant Health Centre, Parottukonam
- 2) District Soil Testing Laboratory, Pathanamthitta,
- 3) District Soil Testing Laboratory, Kottayam and
- 4) District Soil Testing Laboratory, Kozhikkode

The parameters to be estimated for quality analysis of organic manures and equipments required for the same are furnished below.

- **Moisture** - weighing balance, hot air oven, petridish etc.
- **Bulk density**- 100ml measuring cylinder, weighing balance, rubber pad
- **pH**- pH meter
- **Electrical Conductivity** – conductivity meter
- **Organic Matter** - silica crucible, muffle furnace
- **Total Nitrogen** - Kjeldahl's method- Automatic digestion, distillation and titration apparatus (Kelplus)
- **Phosphorus** - desiccator, silica crucible
- **Potassium** - Flame Photometer
- **Secondary & Micronutrients** (Ca, Mg, S, B, Zn, Cu, Fe, Mn) – Atomic Absorption Spectrophotometer (AAS) with graphite furnace, double distillation unit
- **Heavy Metals** (Cadmium, Pb, Ni, Chromium, Mercury, Arsenic) - Flameless AAS or Cold Vapour Mercury Analyser
- **Pathogenicity Test** - Culture tubes, Durham tubes, Bunsen burner, Sterile pipettes, Incubator, Autoclave etc.

The following equipments are available in these selected labs:

- Hot air oven
- Rotary shaker
- Vacuum filtration device
- Vacuum pump
- pH meter
- Electronic weighing precision balance
- Conductivity meter
- Kelplus Digestion and Distillation unit (for the estimation of N)
- Calorimeter/ spectrophotometer (Estimation of Phosphorus)
- Flame Photometer (Estimation of Potassium)
- Water bath, Hotplate
- Atomic Absorption Spectrophotometer with graphite furnace will be purchased under national scheme in District Soil Testing Laboratory – Pathanamthitta, Kottayam and Kozhikkode. AAS is available in Central Soil and Plant Health Centre, Parottukonam (not with graphite furnace).
- Muffle furnace.

Equipments required for organic manure analysis as per FCO are given below:

- Hot air oven

- Rotary shaker
- Vacuum filtration device
- Vacuum pump
- pH meter
- Electronic weighing precision balance
- Conductivity meter
- Flame photometer
- Spectrophotometer
- Muffle furnace
- Hotplate cum stirrer
- Atomic absorption spectro photometer
- Cold vapour mercury analyser or vapour generator assembly for AAS
- Kjeldahl's digestion, distillation and titration unit
- Fume hood with exhaust facility
- Soxhlet apparatus for refluxing

Mode of Implementation

For facilitating Organic Manure Quality Analysis in the selected 4 labs procurement of equipments in addition to the equipments already available, chemicals, glasswares and accessories and creation of additional space and infrastructure have to be done. The training for the technical staff on Organic Manure Quality Analysis is to be imparted for all analysts from institutes like RCOF Bangalore, Kerala Agricultural University etc.

1. Additional Equipments required in Selected Labs for facilitating Organic Manure Quality Analysis

For testing the above parameters of Organic Manure Quality Analysis, the equipments available in the labs (enlisted above) are not sufficient. The details of additional equipments to be purchased is given below.

Sl. No.	Equipment to be purchased	CSPHC, Parottukonam	DSTL, Pathanamthitta	DSTL, Kottayam	DSTL, Kozhikode	Total No.s	Total amount required (Rs. in lakhs)
1	Hot Plate cum Stirrer	1	1	1	1	4	0.80

2	Atomic Absorption Spectrophotometer AAS (with graphite furnace, cold vapour analyser and all lamps)	1				1	15.00
3	Cold vapour mercury analyser or vapour generator assembly for AAS		1	1	1	3	4.50
4	Fumehood with exhaust facility		1	1	1	3	3.00
5	Soxhlet apparatus for refluxing	1	1	1	1	4	1.20
6	Double distillation unit		1	1	1	3	3.00
7	Purchase of additional lamps for AAS (cadmium, lead, nickel, chromium, mercury and arsenic)		6	6	6	18	3.00
8	Autoclave, BOD incubator etc. for pathogenecity test	1each	1 each	1 each	1 each	4each	8.00
	Total						38.50

An amount of **Rs. 38.50 lakhs** is set apart for the purchase of equipments for 4 labs.

2. Chemicals

Various chemicals are required for digestion of samples for analysis. Most of them are used for soil sample analysis and available in these laboratories. The standard technical solutions of heavy metals need to be purchased. For this an amount of **Rs. 2.00 lakhs** will be utilized.

3. Glasswares and Accessories

Most of the glasswares required for the quality analysis of organic manure are available in the selected soil testing labs. For the purchase of additional glasswares an amount of **Rs 2.00 Lakhs** is available for 4 labs.

Chief Soil Chemist is directed to procure the required equipments, chemicals, glasswares and accessories through pooled purchase by observing Store Purchase Rules.

4. Availability of Space & requirement of Additional Infrastructure

For the analysis of Organic Manure more infrastructure have to be created in the available space of the selected Soil testing labs. The details are given below.

Name of Selected laboratory	Floor area available	Additional infrastructure to be created	Availability of Air Conditioner	Approximate Amount for infrastructure works (Rs in lakhs)
DSTL Kottayam	1780 sq.ft	Partitioning of the laboratory room with temporary structures, power connection, plumping, extension of pipelines and other minor items	Available	3.00
DSTL Pathanamthitta	1502 sq.ft	Partitioning of the laboratory room with temporary structures, power connection, plumping, extension of pipelines and other minor items, installation of AC	Nil	3.50
DSTL Kozhikode	2500 sq.ft	Minor electric works, installation of AC	Nil	1.00
CSPHC	Available	Minor works	Available	1.00
TOTAL				8.50

An amount of **Rs. 8.50 Lakhs** is earmarked for the creation of additional infrastructure facilities for 4 labs.

The engineering work in connection with the additional space and infrastructure creation should be done by the department engineering division of the concerned districts. Chief Soil Chemist is directed to take necessary steps in this regard.

5. Additional Staff requirement

The following additional staff will be provided per lab on contract basis.

Agricultural Officer - 1 No. @ Rs. 25,000/month

Lab Attender - 1 No. @ Rs. 7500/month

The Chief Soil Chemist, Assistant Soil Chemists of Kottayam, Pathanamthitta and Kozhikkode districts in consultation with concerned Principal Agricultural Officers/ Project Directors of ATMA should appoint the additional staff as shown above. Wide publicity should be given before conducting the walk-in-interview.

Amount required for paying the consolidated pay of one Agricultural Officer and one lab attender per year is Rs.3.90 lakhs (Rs.32500x12). An amount of **Rs.15.60 Lakhs** is set apart for providing additional staff for 4 labs.

6. Training

The quality of technical output of analysis depend on the knowledge and expertise of the analyst. So training should be mandatory to all analysts from esteemed institutes like RCOF Bangalore, KAU etc. The expenditure for this component will be met from on going schemes.

Financial Outlay

Sl. No.	Parameters	Amount (Rs in Lakhs)
1	Cost of equipments	38.50
2	Chemicals	2.00
3	Glassware and accessories	2.00
4	Infrastructure	8.50
5	Additional staff on contract basis	15.60
6	Service charges and unforeseen expenses	1.00
TOTAL		67.60

(Rupees Sixty Seven Lakhs and Sixty Thousand only)

The expenditure for the amount of **Rs.67.60 lakhs (Rupees Sixty Seven Lakhs and Sixty Thousand only)** will be met from the budget provision of Rs.1000.00 lakhs during 2015-16 under head of account **2401-00-105-85 (Plan)**.