

F.No. 8-2 /2007- Fert.Use
Government of India
Ministry of Agriculture
Department of Agriculture & Cooperation

Krishi Bhawan, New Delhi,
Dated the 7th November, 2008.

To,
The Secretary (Agriculture),
Govt. of -----,

**Subject : Guidelines for implementation of Centrally Sponsored Scheme –
“National Project on Management of Soil Health and Fertility” – reg.**

Sir,

The undersigned is directed to refer to this Ministry's letter of even no. dated 25.08.2008 related to administrative approval of the scheme cited in the subject. After approval of the competent authority, Guidelines for implementation of Scheme have been finalised and are being sent by email as well as by post. Printed version will follow subsequently for implementation this Scheme during the 11th Five Year Plan (2008-09 to 2011-12) with an outlay of Rs 429.85 crore.

The State Government may submit proposals under this Scheme after obtaining recommendations of the State Project Sanctioning- cum – Monitoring Committee at the earliest and after fulfilling the stipulated conditions mentioned in the guidelines so as to reach DAC latest by 24.11.2008. Funds shall be released to the State Designated Agency, whose bank account details (including codes for electronic transfer of money) also need to be furnished to this Department.

Physical Target for various States for setting up Mobile Soil Testing Laboratories (MSTLs), Static Soil Testing Laboratories (STLs) and Fertilizer Quality Control Laboratories (FQCLs) as detailed below are tentative and subject to change as may be decided by the Govt of India on the basis of proposals received and availability & utilization of funds.

Sl.no.	Component	Physical Target for Project period
1	Mobile Soil Testing Laboratories (MSTLs)	-----
2.	Static Soil Testing Laboratories (STLs)	-----
3	Fertilizer Quality Control Laboratories (FQCLs)	-----

(Krishna Bihari)
Assistant Commissioner(INM)

SANJEEV GUPTA

Tel. 23382454
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D.O. No.8-2/2007-Fert.Use

Dated December 12, 2008

In continuation of letter No.8-2/2007-Fert.Use dated November 7, 2008 and interaction held with various Secretaries/Directors of Agriculture on 6.12.2008, (copy of presentation has been hosted on our website), please find enclosed herewith checklist of points which need to be kept in mind while submitting proposals for project-components to be financed through SDA as per para 1.6.12 of the Guidelines, so that the same can be sanctioned immediately:

- i) Name and account details (for facilitating electronic transfer) of the State Designated Agency are to mentioned.
- ii) The projects prepared by the Implementing Agencies should be scrutinised by the State Project Sanctioning and Monitoring Committee (SPSMC) before being sent to Department of Agriculture & Cooperation, Government of India.
- iii) As far as possible, proposal may be sent not only for current year but also for the year 2009-10 in one go.
- iv) Yearwise targets for various States and UTs for Soil Testing Laboratories (STLs), Mobile Soil Testing Laboratories (MSTLs) and (Fertilizer Quality Control Laboratories (FQCLs) for the entire project period have already been conveyed. Total physical targets for the year 2008-09 and 2009-10 are being enclosed in **Annexure 'A'** to this letter. Targets of these three components (viz. STLs, MSTLs and FQCLs) for your State may be computed by promotionally scaling down for these figures for two years. A similar exercise may be carried out for remaining components, though no Statewise figures have been prescribed. These

remaining components shall be sanctioned on the basis of need projected by various States and also considering other factors such as number of land holdings, cropped area etc.

- v) Overall unit-wise financial assistance from the Government of India shall be limited to the figures depicted in **Annexure I** of the Guidelines. However, componentwise costing as given from **Annexure II-A to Annexure VIII** of the Guidelines may also be kept in mind.
- vi) Minimum requirements (i.e. four lamps and double beam in case of AAS and visible range in case of Spectrophotometer) may be adhered to while finalising specifications for procurement. It may be ensured that the equipment procured conform to speed and functionality requirement indicated in the Guidelines.
- vii) Break-up of manpower proposed to be deployed in each of these labs to achieve annual target of 10,000, 5,000 and 4,000 respectively also need to be included in the proposal.
- viii) Upper limit on User Charges to be levied by Implementing Agencies also should be shown in the proposal.
- ix) In case of non-Government Implementing Agencies, past track record may also be mentioned along with supporting documents.

2. **It is requested that the proposals may be sent to this Department within 15 days.** In case of any doubt, the undersigned or the officers concerned [Deputy Commissioner (INM) Tel. No. 23381507, Mobile No. 9891952242 and Assistant Commissioner (INM) Tel. No. 23388911 Extn. 4333, Mobile No. 9891339859] may be contacted. Extra copies of the Guidelines are also enclosed for circulation within your Department and to prospective Implementing Agencies.

Yours sincerely,

(Sanjeev Gupta)
Joint Secretary
Tel. 23382454

S. No.	Component	Physical/Financial Targets	
		2008-09	2009-10
1.	Setting up of Additional STLs	125 / 37.50	125 / 37.50
2.	Existing STLs	75 / 7.50	75 / 7.50
3.			
	STL Staff/Extension Officers	-	2000 / 5.00
	Farmers Training	-	400 / 0.40
	Field Demonstration	-	500 / 0.50
4.	Creation of Data Bank	- / 1.00	- / 1.00
5.	Adoption of Villages	2000 / 4.00	2000 / 4.00
6.	Digital Districts Soil Maps	100 / 2.00	125 / 2.50
7.	Promotion of Organic Manure	0.14 / 7.00	0.12 / 6.00
8.	Promotion of Soil Amendments	0.14 / 7.00	0.12 / 6.00
9.	Distribution of Micro Nutrients	0.14 / 7.00	0.12 / 6.00
10.	Upgradation of Existing FQCLs	8 / 2.00	16 / 4.00
11.	Setting up of new FQCLs	2 / 1.00	8 / 4.00
12.	FQCLs under private/coop. sector	10 / 1.00	20 / 2.00
13.	Setting of MSTLs	250 / 75.00	-

No.8-2/2007-Fert.Use
Government of India
Ministry of Agriculture
Department of Agriculture & Cooperation

Krishi Bhawan, New Delhi
Dated December 30, 2008

To,

Principal Secretary/Secretary (Agriculture)
(All State Governments)

Subject: Submission of proposals for National Project on Management of Soil Health and Fertility.

Sir/Madam,

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In continuation of this Ministry's letter of even number dated December 12, 2008 on the above mentioned subject, I am directed to enclose herewith minimum specifications of critical equipment (duly approved by the National Monitoring Team of Experts as per para 1.6.8 of the Guidelines), which need to be installed in Soil Testing Laboratories, Mobile Soil Testing Laboratories and Fertilizer Quality Control Laboratories. It has been kept in mind that the minimum specifications given in the Annexure to this letter are generic in nature. Thus, sufficient competition can be generated in bidding process (if any) to be adopted by the Implementing Agencies in your State.

2. It is further clarified that the State PSMC/Implementing Agencies may opt for any other sophisticated analysis equipment conforming to minimum requirements of functionality, speed, ease of use and accuracy as per the Guidelines. However, it may be kept in mind that such products are not proprietary in nature.

3. In case of Mobile Soil Testing Labs, it will be desirable (subject to satisfaction of the Implementing Agency/State PSMC regarding quality, price and after sales support) that a composite unit is fabricated and installed through a single source to avoid maintenance related problems.

4. In order to ensure uninterrupted after sales support at a nominal additional upfront payment, the Implementing Agencies may go for 5 years' comprehensive onsite warrantee.

5. In their forwarding letter of the project proposals, the State Governments must clearly indicate that the Implementing Agencies shall bear their share of capital cost and also recurring expenditure. The State Government shall make requisite legal / administrative arrangement to ensure that in case of their failure to do so, the laboratories set up under this Project remain functional.

Yours faithfully,

(Dr. D. Kumar)
Dy. Commissioner(INM)

Copy to Director of Agriculture, Department of Agriculture, all State Governments for information and necessary action.

No.8-2/2007-Fert.Use
Government of India
Ministry of Agriculture
Department of Agriculture & Cooperation

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Krishi Bhavan, New Delhi
Dated the 30th December, 2008

**Subject:- Minutes of the meeting on Specifications on Laboratory Equipments
under National Project on Management of Soil Health and Fertility
(NPMSF) held on 23.12.2008**

The Undersigned is directed to forward herewith a copy of minutes of the meeting of the National Monitoring team of Experts on Specifications of Laboratory Equipments under National Project on Management of Soil Health and Fertility (NPMSF) held on 23.12.2008, for information.

(D. Kumar)
Deputy Commissioner (INM)

As per list enclosed.

Copy for information to

1. PS to Agriculture Commissioner
2. PS to AS (PKB)

Minutes of the meeting of National Monitoring Team of Experts on Specifications of the Laboratory Equipments under National Project on Management of Soil Health and Fertility (NPMSF) held on 23.12.2008 in Committee Room No. 142, Krishi Bhavan under the chairpersonship of Dr. N.B. Singh, Agriculture Commissioner, Ministry of Agriculture.

In order to finalize the specification of main equipments for Static & Mobile soil testing Laboratories (STLs & MSTLs), Fertiliser Quality Control Laboratories (FQCLs), a meeting of National Monitoring Team of Experts was organized on 23.12.2008 under the Chairmanship of Agriculture Commissioner, Dr.N.B.Singh. The list of participants is enclosed at *Annexure -I*.

While welcoming the participants the chairman emphasized that there is a need for suggesting latest specifications of equipment for establishing STLs, MSTLs, and FQCLs by the State Governments and other Implementing Agencies. He added that specifications will be made in such a way that the same will enable the Implementing Agencies to carry out the tests at least for a decade. He also urged that the accuracy in results and speed of processing always depend upon the quality of equipments being procured. The following specifications were agreed upon so as to meet the requirement of speed, functionality, ease of use and accuracy (as per the Guidelines).

1. Atomic Absorption Spectrophotometer (AAS):

The committee gave following views on AAS specification:

- (a) Draft specifications submitted by INM Division was agreed for Fertilizer Quality Control Laboratories (FQCLs).
- (b) The same specifications except item no.13 (*Hydride vapor generation system for Arsenic, Selenium & Mercury cold vapour upto ppb Level*) was considered appropriate for Soil Testing Laboratories (STLs) & MSTLs. However, minimum number of lamps shall be 4 except in those rare cases where additional elements like As,Hg, Se etc. also are to be measured.
- (c) It was decided that equipment with four lamp automatic turret with independent power supplies with coded compatible, hollow cathode lamp for Cu, Fe, Zn and Mn should be preferred. Monochromator with wave length range 190-900 nm., holographic grating 1800 lines/mm. and other specifications given in the agenda note will be sufficient. In case, if State Governments require the facility for analysis of other micro-nutrients , the additional bulb/lamp can be procured.

Dr. P.D. Sharma, DDG, ICAR suggested for incorporation of auto-sampler device and auto sensor for safeguard. On this aspect, keeping the cost in mind, it was suggested that States/Implementing agencies may consider procuring the auto-sampler device, if the volume of samples is large at some locations.

Dr. Suresh Babu, Scientist, ECIL (an enterprise of Department of the Atomic Energy) clarified that AAS being supplied by Department of Atomic Energy has in-built flame safety and protection against gas leakage. Auto sampler is the optional item which can be upgraded for any time for estimation of 50 samples and 10 standards.

Shri Sanjeev Gupta, Joint Secretary (INM), DAC emphasized on good quality after sales support. It was agreed that the suppliers can be asked to give five years onsite warranty, so that high amount of AMC can be avoided.

Shri L.B.Singh, Joint Director Agriculture, UP State Govt., Lucknow emphasized on necessity of training for the staff working in the STLs and MSTLs. In this regard Dr. Babu mentioned that operation of AAS is so simple and even a technician can operate it very easily with one day training only. However, they have provision for training to all of the concerned staff in groups. Final minimum specifications of AAS as agreed during the meeting are given in Annexure-II.

2. Spectrophotometer (Micro Processor, visible range)

The draft specifications provided by INM Division were agreed with the addition that the requirement of the wavelength should have a range of at least 340-960 nm. Detailed specifications are given at *Annexure-II*.

3. Flame photometer (Digital):

The draft specifications provided by INM Division were agreed.

4. Inductively Coupled Plasma Spectrometer (ICP):

Draft specifications given in the Agenda Notes were agreed. Dr. Ramendra Singh, Scientific Advisor, Tata Chemicals Ltd, Noida provided the details of specification and addresses of suppliers. However, States may screen the specification of different manufactures and opt for best suited to their requirement. It was suggested by the Chairman that the State Government may procure at least one or two ICP for their central laboratories.

However detailed specification of Inductively Coupled Plasma Spectrometer (ICP) is given at *Annexure-II*.

5. Continuous Flow/Auto Analyser:

Dr. A.K. Yadav, Director, NCOF, Ghaziabad presented details of continuous Flow Analyzers / Auto Analyzers. It was found that such equipments can measure C, N, P alongwith secondary and micronutrients (4 elements at a time @ 2 minutes). The equipment provides low running cost and high efficiency with much less manpower using conventional calorimetric / photometric method.

Sh. Sanjeev Gupta, Joint Secretary (INM) stated that if State Govt. finds any better equipment, they may procure it. It was found that there may still be some more sophisticated equipment. It was decided that the State PSMC/Implementing Agencies may opt for any other sophisticated analysis equipment conforming to minimum requirements of functionality, speed, ease of use and accuracy as per the Guidelines. However, it may be kept in mind that such products are not proprietary in nature.

6. Mobile Soil Testing Van:

While deciding the specifications for Mobile Soil Testing Van /Laboratory, Shri L.B.Singh, Joint Director Agriculture, UP State Govt., Lucknow raised the issue that in Mobile Testing Vans there are lot of breakage of glassware (upto 80 %) and dismantling of equipments during transportation in the field. Shri Singh mentioned that such problems are common as these were fabricated and equipped from various sources. On this aspect, Dr. Suresh Babu, Scientist, MoAE expressed that ECIL has launched a composite MSTL specially designed for vibration / shock free enclosure for glassware to avoid frequent breakage. The committee felt that the States may give preference to the full composite unit procured from single supplier instead of assembling the vehicle and fabricated from local fabricator. Minimum specifications prepared by INM Division for MSTLs Van were agreed with some additional facilities and infrastructure as suggested by the members. The detailed specification is given at *Annexure-II*.

The meeting ended with vote of thanks to the Chair.

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Annexure-I

List of participants attending the meeting on specifications of laboratory equipments under the scheme “National Project on Management of Soil Health & Fertility”

1. Dr. N. B. Singh, Agril. Commissioner, DAC
1. Shri Sanjeev Gupta, Joint Secretary (INM), DAC
2. Dr. P.D.Sharma, ADG (Soil), ICAR
3. Dr. D. Kumar, Deputy. Commissioner (INM), DAC
4. Shri Dharampal, Deputy. Commissioner (INM), DAC
5. Dr. A.K. Yadav, Director, NCOF, Ghaziabad
6. Dr. G. Chakraborty, Director, CFQC7TI, Faridabad
7. Dr. Ramendra Singh, Scientific Advisor, Tata Chemicals Ltd, Noida
8. Dr. C.P.Srivastav, Sr. Fert. Analyst, FQCL, UP State Govt., Lucknow
9. Shri L.B.Singh, Joint Director Agriculture, UP State Govt., Lucknow
10. Dr. Suresh Babu, Scientist, ECIL (an Enterprise of Department of the Atomic Energy), Hyderabad.
11. Dr. Krishna Bihari, Asstt. Commissioner (INM), DAC
12. Shri Jasvir Singh, STA (Manure), DAC

MINIMUM SPECIFICATIONS OF THE INSTRUMENTS REQUIRED FOR THE FOCLs, STLs & MSTLs

1. Atomic Absorption Spectro Photometer (For Fertilizer Quality Control Laboratories)

- Computer controlled true double beam Atomic Absorption spectrophotometer.
- Eight Lamp automatic turret with independent eight power supplies with coded lamp compatible.
- Monochromator with Wavelength range 190-900 nm. Holographic grating of high density of not less than 1800 lines/mm.
- Must have wavelength locating by automatic peak searching, auto loading of all parameters and auto bandwidth selection and continuously variable selection 0.2-2.0 nm with D2 lamp background correction.
- Titanium burners for C₂H₂ – N₂O & C₂H₂ – AIR with precise knobs for burner optimization i.e. height, rotational and lateral.
- Fully inert nebulizer.
- Gas system with automatic flame changeover, full safety interlock including pressure sensors on both lines, power failure protection, burner interlock and flame sensor, flame ignition should be automatic.
- Burner movement thorough computer, all three directional, height, rotation, lateral.
- PTFE spray chamber and adjustable impact bead aerosol.
- PC operating software should be able to run with MS Windows / Open Source Software should be compliance with international quality norms and should have upgradeable facility.
- Suitable computer system ISO certified and printer should be quoted. The system may also be upgraded with all major accessories. Suitable for 230 V : 50/60 Hz operation.
- Single element coded Hollow Cathode lamps : Cu, Fe, Zn.,Mn.,Mg, B,K,Mo.
- Hydride vapor generation system for Arsenic, Sellenium & Mercury cold vapour upto ppb level.
- System should have facilities of repeat of result of same sample and date treatment. Automatic calculation of percentage in base material.
- **Accessories :**
Acetylene and Nitrous Oxide cylinder with regulator, air compressor, air filter, voltage stabilizer spares and consumables for 2 years operations. SS Exhaust Fume Hood with inert centrifugal blower, Instruction manual & Circuit diagram to be provided.

2. Atomic Absorption Spectro Photometer (For STLS and MSTLs):-

Same as 1 above except following two changes:

- For Soil Testing Labs (including Mobile Soil Testing Labs) AAS with four lamp automatic turret with independent power supplies shall suffice for measuring Cu, Fe, Zn and Mn.

- Hydride generation system for Arsenic, Selenium & Mercury Cold Vapour (up to ppb Level) is not necessarily required in case of Soil Testing Labs including Mobile Soil Testing Labs.

3. Spectrophotometer - Micro-Processor Based (Visible Range)

Wavelength	: At least 340-960 nm (Visible Range) – User Selectable
Resolution	: 0.2 nm
Accuracy	: ± 1 nm
Repeatability	: ± 0.5 nm
Bandwidth	: < 2 nm
Measuring Mode	: % Transmittance (% T), Absorbance (ABS), Concentration (CONC) by K – Factor and Multi-standards
Operating Modes	: Single Wavelength : measuring % T, ABS and CONC, Spectrum Scan measuring % T and ABS Time Scan, measuring % T and ABS
Source	: Tungsten Halogen Lamp
POWER	: 230 V \pm 10 %, 50 / 60 Hz
Standard Accessories	: 10 nm path length Four (4) cavettes matched within $\pm 0.3\%$

4. Flame Photometer (Digital):-

- System for the measurement of alkali and alkaline earth metals (only Sodium, Potassium, Calcium and Lithium) in the environmental samples, using the technique of flame photometry, comprising of an aspirator unit, oil free compressor, burner unit, filters and photo detector.

Technical Specifications

- Instrument response / Sensitivity**

Measuring Range	: 0 to 1999
Elements analyzed	: Na ⁺ , Ca ⁺ , K ⁺ , Li ⁺
Sodium	: Upto 100 units for 2 ppm or less
Potassium	: Upto 100 units for 1 ppm or less
Accuracy & Reproducibility	: less than ± 2 %
Sensitivity	: Na ⁺ & K ⁺ = 0.5 ppm Ca ⁺² = 5 ppm Li ⁺ = 2 ppm
Linearity	: less than $\pm 1\%$ at midpoint with 3 ppm K ⁺ set at 100

- Display** : At least 3 digit LCD
- Detector** : Photo conductive cell
- Filters** : Metal interference for Sodium, Potassium, Calcium and Lithium
- Power requirement** : 230 \pm 10 V, 50 Hz AC
- Aspiration rate** : 3 to 6 mL/min

5. Inductively Coupled Plasma Spectrometer (ICP)

- Inductivity coupled Plasma Spectrometer (ICP) with high efficiency emission optical system having wave length ranging from 160-900 nm. capable of plasma viewing and read signals from both axial and radial view through high resolution Mega Pixel Charge Injection Device Detector (CID) or CCD Detector Device. RF power 1500-1700 W. Mainly required for detection of all elements such as, N, P, K, Ca, Mg, S, Mn,Fe,Zn,B,Mo,Co, As, Hg,Ni,Pb etc. in soil samples and chemical fertilizer samples. Provided with fully web integrated ICP software having full PC control of instrument settings and compatible accessories.
- Supplied with standard accessories such as, standard sample introduction kit, gas control and RF generator, 3 channel peristaltic pump, water re-circulating chillar and vapour generation assembly, fume hood, argon gas cylinder, double stage pressure regulator, 10KVA on line UPS, computer printer and multi-element standards.

6. Continuous Flow Analyzers/Auto Analyzers

- The analyzer should be based on continuous flow with air bubble segmentation system, using traditional methods of analysis with photometric detection. The instrument should have three main components.
 - Auto-sampler
 - Chemistry module with detectors
 - Data handling and programming system
- The instrument should be capable of analyzing four parameters simultaneously with independent flow system, chemical / diluents addition / colour development and detectors fitted in two twin detector modules or in four independent detection modules. Facility to add other detectors like IR, UV & Flame photometer.
- Although, initially four parameters can be analyzed simultaneously but the system should be upgraded to analyze more parameters sequentially or simultaneously.
- **Auto Sampler** : Sampler to introduce to liquid sample to the analytical modules should be random access sampler with 100 or more sample cups. Built in rinsing pump to be provided for easy maintenance. To be operated by software. Sample wash and air time setting to be provided.
- **Chemistry module holder**: Each parameter should have separate module with all components of analysis, for automatic analysis. Flow cell and filter to be part of the module. The flow cell should be protected in such a way that external light does not interfere with the accuracy of analysis. Flame photometer should be provided for Potassium measurement as well.
- **Detector** : All the four detector placed simultaneously should be capable of measuring four elements simultaneously.
- **Parameters to be analyzed** : Nitrogen, Carbon, Phosphate, Potassium, Boron, Sulphur, Zinc, Mg., Fe, Molybdenum, Calcium, Copper, Mn.

- **Software** : Easy to use windows based software and suitable PC & Printer to be provided.
- **Speed of measuring NPK and 5 other elements as above** : 200 per day or higher.

7. Mobile Soil Testing Van (minimum requirements)

Integrated fabricated van and equipments fitted in MSTLs

- Any suitable four wheeler van having 6-7 ton capacity.
- Procured from originally manufacturer or their authorized dealer. Fabrication should be done by approved ISO certified workshop. Fitted with following equipment in shock proof/vibration free design. Laboratory area with at least 2 x 3.450 meter, height 1.65 meter. Generator room 1.000 x 2 meter & driver cabin having additional seat cum sleeper.
- Interior wood work as per laboratory standard- top cover furnishing with acid proof sun-mica wooden flooring.
- Suitable slab & cupboards for glassware & chemicals & allied items.
- Laptop and printer with appropriate software.
- Additional facility; electric control panel & Electrical wiring, lighting and extra power points for external power points, safety for short circuiting, collapsible ladder, fire extinguisher, working slab and chair.
- Genset 7.5VA branded silent type in special enclosure to remove fumes & heat of laboratory.
- Air conditioner-1.5 ton-branded
- Water Tank 200 liter capacity
- Stainless steel sink and LPG cylinder for flame photometer
- AAS- 4 lamp turret, PC control, double beam, spectrophotometer for estimation of Cu,Fe,Mn,Zn and complete with all essential installation accessories.
- List of other equipments as per *Annexure-II-B*.
- Van registration, insurance of van and equipments.

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