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भारतीय मृदा विज्ञान संस्थान (भा०कृ०अनु०प०)
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Date: 10/01/2017

Application No. 112-12/IISS/RTI/2016

To,
Sh. Shankar Lal
Parthvimeda Gau Pharma Village – Pathmeda,
Sanchore 343041
Rajasthan

Sub: Reply to information under RTI Act, 2005- reg.

Sir,

Please find enclosed herewith the information in response to your application received at this end under RTI application No. 112-12/IISS/RTI/2016 dated 27/12/2016. You are requested to deposit Rs. 48/= as page charges (24x2) for the information on receipt of the same. Further it is informed that the Appellate Authority is Director, ICAR-IISS, Bhopal and his telephone no. is 0755-2730946.

Yours sincerely

(R. Elanchezhian)
Principal Scientist & CPIO

Encl: Information containing 24 pages.

Copy to:

Dr. P.P. Biswas,
Krishi Anusandhan Bhavan-II, Indian Council of Agricultural Research,
Pusa, New Delhi-110012

O/C
10/1/17

The Right to Information Act 2005

Application for obtaining information

SUB: The test procedure of organic manure

Details of Information

1) **The test procedure of "organic manure"** in ICAR- The test procedures of organic manure followed in ICAR-IISS is enclosed

2) As per rules, the timeline required for complete testing of one sample- 30 days but at the same time 30 samples can be analyzed in respect of each parameters analysis which are important deciding quality parameters of organic manure.

3) **How to adjust the final report if we get two different test data of the same sample:** We follow the standard procedure as given by FCO.

4. **Below items are for your kind information and consideration;**
The details of fees required for analysis of samples. (Copy enclosed)

4/1/17

Chapter 8
Methods of Compost Analysis

Analysis of compost is important and required for quality assessment. Methodologies for analysis prescribed in the FCO for physical, chemical and biological parameters, pathogenicity test and heavy metals toxicity limits have been incorporated in this chapter. In addition, some other maturity parameters followed in other countries have also been included.

8.1 Analysis of Physical Properties

These consist of (i) particle size analysis as determined by sieving (see chapter 7.1.1), (ii) bulk density, (iii) color, (iv) temperature and (v) moisture content

8.1.1 Estimation of Bulk Density

(BD of mature compost is 0.7 to 0.9 g cm^{-3})

Instruments required: Hot air over, 100 mL measuring cylinder, weighing balance, rubber pad [1 sq foot; 1 inch thickness]

Procedure:

1. Weigh a dry 100mL cylinder (W1 g).
2. Fill the cylinder with the sample up to the 100 mL mark. Record the volume (V1 mL).
3. Weigh the cylinder along with the sample (W2 g).
4. Tap the cylinder for two minutes and measure the compact volume (V2).

Calculation:

$$\text{Bulk density(BD)} = \frac{\text{Weight of the sample taken (W2-W1)}}{\text{Volume (V1-V2)}}$$

8.1.2 Colour (brownish-yellow)

The colour of the matured compost may be estimated using 2% Iodine test. Take 1 g of matured compost and add 2.5 mL of distilled water. Filter the suspension with Whatman No.2 filter paper. Add a few drops of 2% iodine. The brownish-yellow colour will appear.

8.1.3 Estimation of Moisture Content

In a weighed clean, dry petri dish, weigh to about 5 g of the prepared sample. Heat the sample in an oven for about 5 hours at 65° ± 1°C

to constant weigh, cool in a dessicator and weigh. Loss in weight gives the moisture content.

Calculation:

$$\text{Moisture percent by weight} \frac{100\ (B-C)}{B-A}$$

Where A = Weight of the petri dish, B = Weight of the petri dish plus material before drying and C = Weight of the petri dish plus material after drying.

8.2 Analysis of Chemical Properties

The 13 chemical parameters for which compost is analyzed are (i) pH, (ii) electrical conductivity (EC), (iii) total organic carbon (TOC), (iv) total N (TN), (v) NH_4^+ and NO_3^-, (vi) hot-water soluble C, (vii) Hot-water soluble carbohydrates, (viii) cation exchange capacity (CEC), (ix) lignin, (x) cellulose, (xi) Total-P, (xii) citrate soluble-P and (xiii) water soluble-P.

8.2.1 Estimation of pH of well prepared Compost

Make 25 g of compost into a suspension in 50mL of distilled water and shake on a rotary shaker for 2 hours. Filter through Whatman No. 1 or equivalent filter paper under vacuum using a Buchner funnel. Determine pH of the filtrate by pH meter.

8.2.2 Estimation of Electrical Conductivity of Compost

Equipments required are (i) 100 mL beaker, (ii) funnel [OD 75 mm], (iii) 250 mL flask, (iv) analytical balance, (v) potassium chloride [0.01 N, AR grade], (vi) Filter paper and (vii) conductivity meter [with temperature compensation system]

Method

1. Pass fresh sample of compost through a 2-4 mm sieve and take 20g of the sample in 100 mL beaker.
2. Add 100 mL of distilled water to it to give a ratio of 1:5 and stir for about an hour at regular intervals.
3. Calibrate the conductivity meter by using 0.01 M KCl solution.
4. Measure the resistance on the conductivity meter.

Calculation

The EC is expressed as millimhos/cm or dSm^{-1} at 25°C specifying the dilution of the compost suspension viz, 1:5.

8.2.3 Estimation of Organic Carbon (OC)

Instruments/equipments required are Silica/Platinum crucible 25 g cap and a muffle furnace.

Method

Accurately weigh 10 g oven dried sample (105°C for 6 hrs) in a pre-weighed crucible and ignite the material in a muffle furnace at 650-700°C for 6-8 hrs. Cool to room temperature and keep in desiccator for 12 hrs. then weigh the contents with crucible.

Calculation

$$\text{Total organic matter (\%)} = \frac{\text{Initial wt - final wt. X 100,}}{\text{wt. of sample taken}}$$

$$\text{Total C \%} = \frac{\text{Total organic matter}}{1.724}$$

8.2.4 Estimation of Total Nitrogen (N) by the Kjeldahl Method

Instruments

1. Suitable Kjeldahl assembly consisting of 500-800 mL round bottom digestion flask and Kjeldahl distillation assembly consisting of 500-800 mL distillation flask, splash head tube and condenser, all with appropriate glass joints. The length of the condenser's delivery tube should be long enough to keep immersed in a flask for ammonia absorption.
2. Kjeldahl digestion unit with heating control, suitable for 500-800 mL flasks.

Reagents

1. Sulphuric acid: 93-98% H_2SO_4, Salicylic acid (reagent grade), and Sodium thiosulphate ($Na_2S_2O_3 \cdot 5H_2O$).
2. Digestion catalyst mixture: Prepare an intimate mixture of 200 g K_2SO_4, 20 g $CuSO_4.5H_2O$ and 2 g Se powder. These reagents prepared separately before mixing.
3. Boric acid indicator solution: Place 80 g of pure boric acid (H_3BO_3) in a 5 L flask marked to indicate a volume of 4 liters, add about 3.8 L of water, heat and swirl the flask until the H_3BO_3 is dissolved. Cool the solution, add 80 mL of mixed indicator solution. (To prepare mixed indicator take 0.099 g of bromocresol green and 0.066 g of methyl red in 100 mL of ethanol. Then add 0.1N NaOH until the solution is reddish purple (pH 5.0) and make the solution to 4 litre by water).
4. 45% NaOH solution. Dissolve 450 g of NaOH pellets in distilled water and make up the volume to 1000 mL.
5. Sulphuric acid standard solution - 0.01N or as required.

Procedure

1. Place weighed sample (0.5-1g compost) in the digestion flask. Add 40 mL H_2SO_4 containing 2 grams salicylic acid. Shake until thoroughly mixed and let stand, with occasional shaking for 30 minutes or more.
2. Then add 5 g of $Na_2S_2O_3.5H_2O$, shake the flask and let it stand for five minutes, then heat over low flame until frothing ceases. Turn off heat, add 1.1 g of catalyst mixture and boil briskly until solution clears, continue boiling for another at least 2 hours. Remove from burner and cool, add 200 mL of water and swirl the flask to dissolve all the contents.
3. Transfer to 500 mL volumetric flask, giving several washings with water to the digestion flask. Make up the volume to 500 mL.
4. Take 25 mL aliquot in the distillation flask, add 300 mL water and add 30 mL of 40 % NaOH to the distillation flask, gently so that the contents mix immediately, then connect the flask to distillation assembly and swirl to mix the contents. Heat until all the ammonia is distilled (at least 150 mL distillate).
5. Take 20 mL of standard boric acid indicator solution in the receiving conical flask, and keep the flask at the lower end of the condenser in such a way that the lower tip of the condenser is fully immersed in acid solution. Remove from receiving flask. Rinse outlet tube into receiving flask with a small amount of distilled water.
6. Titrate the contents in the receiver conical flask with standard H_2SO_4 solution. Determine blank on reagents using same quantity of standard acid in receiving conical flask.

Calculation

$$\text{Nitrogen \% by weight} = \frac{(T-B) \times 1.4 \times N\ (H_2SO_4) \times Df}{\text{Wt. of soil}}$$

where

T = Volume in mL of standard acid taken in receiver flask for sample

B = Volume in mL of standard acid used in receiver flask for blank

N = Normality of standard acid, W = Weight in g of sample taken

Df = Dilution factor of sample

8.2.5 Estimation of Total Phosphorus

Note: Digestion of compost with HNO_3-$HClO_4$ instead of the tri-acid mixture (HNO_3, H_2SO_4 and $HClO_4$ in 10:1:4 ratio) is also adopted especially when sulphur is to be determined in the same digest.

Tri-acid Digestion

Instruments and reagents: Water bath and hot plate, Tri-acid mixture: Mix AR grade conc. HNO_3, H_2SO_4 and $HClO_4$ in 10:1:4 ratio and cool.

Method of digestion (tri acid)

1. Transfer 1 g of dried and processed compost to a 150 mL conical flask. Add 5 mL of conc. HNO_3.
2. Keep a glass funnel on the flask, place it on a hot plate and heat at 100 °C for about 30 minutes followed by heating at 180-200°C. Continue boiling until near to dryness, but not drying completely. Cool and add 5 mL of the tri-acid mixture. Heat constantly until the dense white fumes are evolved and continue digestion until the mixture is largely volatilized. If the contents are still brown, cool a little and add 5 mL of the tri-acid mixture and continue the digestion as described above.
3. Remove the flasks when only moist, clear and white contents are left. The entire quantity of $HClO_4$ has volatilized by this stage. Cool and add water about 50 mL. Filter into 100 mL flask, giving washings to make the volume to 150 mL. Use the filtrate for analysis.

Di-acid Digestion

Instruments and Reagents: Hot plate., Conc. HNO_3 (AR grade), 60 % $HClO_4$ (AR grade), Approx. 2N HCl (AR grade)

Method of Digestion (Di-acid)

1. Weigh 1 g of dried and processed compost sample in a 150 mL conical flask.
2. For pre-digestion, add 10 mL of conc. HNO_3, place a funnel on the flask and keep for about 6-8 hours or overnight at a covered /chamber. After pre-digestion add 10 mL of conc. HNO_3 and 5 mL of $HClO_4$.
3. Keep on a hot plate and heat at about 100 °C for first 1-2 hour and then raise the temperature to about 200 °C and continue digestion until the contents become colorless and only white dense fumes appear. Do not allow to dry up.
4. Remove the flasks from hot plate, cool and add about 50 mL of distilled water and filter through Whatman No. 42 into a 150 mL volumetric flask. Give 2-3 washings of 5-10 mL portions of distilled water and make the volume to 150 mL.

Estimation of P in the Digestate (common for di acid and tri acid)

Instrument and Reagents

1. Spectrophotometer or Colorimeter

2. Vanadate-molybdate reagent: Prepare solution A' by dissolving 25 g of ammonium molybdate in about 400 mL of warm water. Prepare solution 'B' separately by dissolving 1.25 g of ammonium metavanadate in about 300 mL of boiling water, cool it and add 250 mL of conc. HNO_3. Cool again at room temperature. Now add solution 'A' to solution 'B' and dilute to one liter.
3. Standard P solution: Prepare solution containing 100 mg P/ L by dissolving 0.439 g of dried KH_2PO_4 in water, acidifying with 25 mL of 7N H_2SO_4 and making the volume to 1 L. Prepare a working standard containing 50 mg P/ L from it.

Method for Absorbance

1. Transfer a suitable volume of the final digestate to a 50 mL volumetric flask so that it contains 0.05 to 1.0 mg of P and the acid equivalent is between 0.6 and 1.6 N in the final volume of 50 mL. Add 10 mL of the vanadate-molybdate solution and dilute to 50 mL with water.
2. Mix well and read the absorbance after 10 minutes using 420 nm wavelengths (blue filter). Run a blank (without P) simultaneously.
3. Take 1.0, 1.5, 2.0, 2.5, 3.0, 4.0 and 5 mL of the 50 mg PL^{-1} solution in 50 mL volumetric flasks and develop color in identical manner. Prepare standard curve with P concentrations against % transmission/colorimeter readings.

Calculation for P Content of Compost

$$\text{P content of compost (ppm)} = \quad A \times Df$$

where, A stands for P concentration in µg as read against the sample reading on the standard curve, and Df stands for (dilution factor), that is the volume of aliquot taken (mL) for color development out of the 150 mL acid digest made from 1 g sample.

8.2.6 Estimation of Total Potassium

Total potassium are usually determined by dry ashing the compost sample at 650-700°C , dissolving in concentrated hydrochloric acid and measuring its concentration using a flame photometer.

Reagent and Standard Curve

1. Potassium chloride standard solution: Make a stock solution of 1000 ppm K by dissolving 1.909 g of AR grade KCl (dried at 60°C for 1 hr) in distilled water; and diluting up to 1 litre. Prepare 100 ppm standard by diluting 100 mL of 1000 ppm stock solution to 1 litre with extracting solution.

2. Standard curve: Pipette 0, 5, 10, 15 and 20 mL of 100 ppm standard solution into100 mL volumetric flasks and make up the volume upto the mark. The solution contains 0, 5, 15 and 20 ppm K.

Method

1. Take 5g compost sample in a porcelain crucible and ignite the material to ash at 650-700°C in a muffle furnace for 12 hrs.
2. Cool it and dissolve in 5 mL concentrated hydrochloric acid, transfer in a 250 mL beaker with several washing of distilled water and heat it. Again transfer it to a 100 mL volumetric flask and make up the volume. Filter the solution and dilute the filtrate with distilled water so that the concentration of K in the working solution remains in the range of 0 to 20 ppm, if required.
3. Determine K by flame photometer using the K- filter after necessary setting and calibration of the instrument. Similarly read the different concentration of K of the standard solution and prepare the standard curve by plotting the reading against the different K concentrations.

Calculation

% Potassium (K) by weight =Rx20x diluting factor, where R= ppm of K in the sample solution (obtained by extra plotting from standard curve)

8.2.7 Water Extractable, (soluble) Carbon in Compost

An extraction with water is commonly used to obtain a labile soil carbon fraction (McGill et al., 1986). Similarly in compost with water extractions as part of active pools of C comparing several techniques are used to assess compost maturity. Water extractable C and carbohydrates are significantly correlated with the biodegradable indices (Morel et al., 1979).

Reagents

1. Cold water and Conc. H_2SO_4
2. HgO
3. 0.4N $K_2Cr_2O_7$: Dissolve 19.58 g $K_2Cr_2O_7$ in distilled water and dilute to 1L.
4. Orthophosphoric acid (H_3PO_4).
5. 0.035N ferrous ammonium sulphate (FAS). Dissolve 13.72 g FAS and 1.75 mL of H_2SO_4 in distilled water and dilute to 1L.
6. Ferroin indicator: Dissolve 0.695 g of $FeSO_4.7H_2O$ and 1.485 g orthophenanthroline monohydrate in 100 mL of distilled water. Alternatively, use ready-made ferroin indicator. Diphenylamine indicator can also be used instead of ferroin (Dissolve 1g Diphenylamine in 100 mL H_2SO_4).

Method

1. Weight 5 g of field moist compost for each sample in a 50 mL centrifuge tube. Add 20 mL of deionized water in glass tube or centrifuge tube.
2. Centrifuge at 1000 rpm for 30 minutes.Filter the supernatant with suction through a 0.2µm filter and wash 3-4 times with deionized water upto the volume of 50 mL.
3. Organic carbon in the extracts is determined by digesting the filtered extract (10mL) with 0.4N $K_2Cr_2O_7$ (2mL), HgO (70mg), 10 mL of conc. H_2SO_4 and 5 mL H_3PO_4 in 500 mL conical flask. The mixture is boiled gently on hot plate at 105°C for 60 minutes under reflux condition. Add 250 mL of distilled water and cool to room temperature. Run two blanks with 10mL of distilled water each along with the acid mentioned above.
4. The excess dichromate is determined by back titration with FAS using 5-8 drops of ferroin indicator and titrated against 0.035 N FAS to get a brick-red end point. The acidified FAS solution is standardized against the 0.4N $K_2Cr_2O_7$.

Calculation

(i) Compost moisture content (%)

$$= \frac{\text{Wt of wet compost (g) - Wt.of oven dry compost (g) x 100}}{\text{Weight of oven dry compost (g)}}$$

(ii) Weight of equivalent dry weight of compost sample taken for water extractable carbon measurement (X g)

$$X = \frac{\text{Wt. of wet compost (g) x 100}}{\{100 + \text{compost moisture (\%)}\}}$$

(iii) Determination of Water extractable carbon (Ext.C µg/mL):

(a) Volume of $K_2Cr_2O_7$ solution consumed by FAS in a sample (Z, mL)

$$Z = \frac{\text{Normality of FAS (N) x titer value (mL)}}{\text{Normality of } K_2Cr_2O_7}$$

(b) Volume of $K_2Cr_2O_7$ consumed for easily oxidizable C in 10 mL of extractant

= 2- Z mL

(iv) Water extractable C (Ext C)

1mL of 1N $K_2Cr_2O_7$ oxidizes 0.003 g of C

1mL of 0.4 N $K_2Cr_2O_7$ oxidizes 0.0012 g of C i.e. 1200 µg of C mL.

(2-Z) mL of 0.4 N $K_2Cr_2O_7$ oxidizes 1200 x (2-Z) µg of C

Therefore the amount of water extractable C (Ext C in µg of C/ mL)

$$= \frac{1200 \text{ x } (2\text{-}Z)}{10}$$

(v) Total weight of water extractable C in the sample:

$$\text{Water Ext.C (µg/g compost)} = \frac{\text{Water Ext.C (µg/ mL-1) *50 (mL)}}{\text{X (g)}}$$

8.2.8 Water Soluble Carbohydrates in Compost

Water-soluble carbohydrates, which can be obtained by hydrolysis, are a readily decomposable pool of compost, and are an important source of energy for microorganisms. Carbohydrates may comprise 5 to 25% of plant organic matter and exist in several form ranging from simple sugars to polysaccharides including cellulose and hemicellulose. Carbohydrate content and composition is classically determined through a combination of acid hydrolysis (extraction phase) and chromatography (Brink et al., 1960).

Instruments and Reagents

1. Colorimeter
2. Distilled water, 0.2 % anthrone, Glucose standard and 6 N NaOH

Method

1. Weight 5 g of oven-dried compost (150 µm mesh sieve) in 150 mL of conical flask.
2. Add 10 mL of 24 N H_2SO_4 and allow for hydrolyzing for 24 hours on a steam bath at about 100°C throughout the hydrolysis. Close the container to minimize evaporation.
3. Filter the acid hydrolysate by filtration through a sintered glass funnel (porosity 3) and neutralized to pH 6.8 with 6N NaOH solution. The residue is washed with 10 mL of hot water per g of soil. Allow the filtrate to cool at room temperature and make up the volume in volumetric flask by addition of distilled water up to 50 mL.
4. A dark colored precipitate that is formed is removed by centrifuging (10,000 rpm for 10 minutes.) and the supernatant liquid resulti is referred to as the acid hydrolysate.

5. Take 5 mL of hydrolysate in pipette and pore into test tubes (150mm by 25 mm size) and add 10 mL of 0.2% anthrone rapidly and shake immediately for a moment to mix the content. The content color is green. Take the reading at 625mμ in spectrophotometer.
6. Standard Curve: Prepare glucose solution of 0, 5, 10, 20, 40 and 80 mg/ L into 50 mL volumetric flask. Five mL of each are taken with 10 mL of anthrone and read on the spectrophotometer at 625 mμ. A plot of % transmission vs. concentration gives the standard curve. A blank consists of 5 mL of distilled water plus 10mL of the anthrone reagent as acid-anthrone blank.

Calculation

Acid hydrolysable carbohydrates (ppm) = OD (ppm) x dilution factor

8.2.9 Estimation of NO_3-N and NH_4-N

During composting, only a small fraction of N gets mineralized. Very little N is also present as NH_4^+, NO_2^- and NO_3^-. Determination of NH_4-N and NO_3-N formed on decomposition of waste under aerobic and anaerobic conditions is also made as these are considered to be a satisfactory an index of N availability in aerobic composting.

Instruments

1. Mechanical shaker and N distillation set

Reagents

1. 2 N KCl: Dissolve 149.10 g of KCl in water and make the volume to 1L.
2. 2% Boric acid: Dissolve 20 g of boric acid powder in warm water by stirring, and dilute to 1 L.
3. Mixed indicator: Dissolve 0.066 g of methyl red and 0.099 g of bromocresol green in 100 mL of ethyl alcohol. Add 20 mL of this mixed indicator to reach litre of 2% boric acid solution. Adjust the pH to 4.5 with dilute HCl or dilute NaOH.
4. 0.02N H_2SO_4: Prepare approximately 0.1 N H_2SO_4 by adding 2.8 mL of conc. H_2SO_4 to about 990 mL of distilled water. From this, prepare 0.02 N H_2SO_4 by diluting a suitable volume five times with distilled water. Standardize it against 0.1 N NaOH.
5. Devarda's alloy: This is composed of 50, 45 and 5 % Cu, Al and Zn, respectively.
6. MgO: CO_2 free AR grade MgO.

Method

1. Weigh 10 g of wet sample passed through 2-4 mm sieve. Add 100 mL of 2 N KCl solutions.Filter the contents through Buckner funnel or equivalent filter paper.

2. Measure 20 mL of the clear filtrate in a 250 mL boiling flask. Add about 180 mL of distilled water, 0.2 g of freshly ignited and cooled MgO.
3. Distill the contents and collect ammonia in 20 mL of 2 % boric acid solution containing 20 mL mixed indicator/litre of boric acid. Titrate against standard acid and find out the amount of N. This N is called NH_4-N.
4. To determine NO_3-N, allow the same distillation flask to cool, add 0.2 g Devarda's alloy and estimate NO_3-N in the sample.
5. Also carry out the distillation without compost sample and find out the N content as blank.Deduct this amount of N gets from that obtained in blank to compost sample.

Calculation

$$\text{Available-N } (NH_4\text{-N and } NO_3\text{-N}) (\%) = \frac{(T\text{-}B) \times 1.4 \times \text{N of acid} \times Df}{\text{Wt of compost}}$$

8.2.10 Determination of Water Soluble & Citric Acid Soluble-P

The water soluble P is obtained from the sample by dissolving it in distilled water and citrate soluble-P by dissolving it in 2% citric acid solution.

Method

Obtain water soluble phosphate (A) and citric acid soluble-P (B) by the following methods:

Water Soluble P: Take 1 g of compost sample and transfer it to a beaker with 25 mL of water. Add activated charcoal (0.5 g) and stir well with glass rod for 5 minutes and filter. Wash the residue with hot water. Collect the washing and filtrate (Whatman no. 42) in a 250 mL volumetric flask and make the volume. Use this water extract for determination of water soluble P in sample.

Citric Acid Soluble P: Take 1 g of compost sample and transfer it to a beaker with 25 mL of 2 % citric acid solution. Add activated charcoal (0.5 g) and shake with rotary shaker for 30 minutes and filter. Wash the residue with 2% citric acid solution. Collect the washings and filtrate (Whatman no. 42) in a 250 mL volumetric flask and make the volume. Use this citric acid extract for determination of citric acid soluble P in sample.

The major drawback with the blue color development method (Dickman and Bray 1940) is that the color starts fading soon, and hence the intensity has to be measured quickly. A method using ascorbic acid (Watanabe

and Olsen 1965) as described below provides a more stable blue color and is therefore, preferred over the former.

Colorimetric Reading for P Extracted

Reagents

1. Molybdate-tartarate solution: Dissolve 12g ammonium molybdate in about 250 mL of distilled water to get solution 'A'. Prepare solution 'B' by dissolving 0.291g of antimony potassium tartarate in 100 mL of distilled water. Prepare one liter of 5 N H_2SO_4 and add solutions 'A' and 'B' to it. Mix thoroughly and make the volume to 2 liters with distilled water.
2. Ascorbic acid solution: Dissolve 1.056 g of ascorbic acid in 200 mL of the molybdate-tartarate solution and mix well. Prepare it fresh as and when required.
3. p-nitrophenol indicator: Dissolve 0.5g of p-nitrophenol in 100mL of distilled water.
4. 5 N H_2SO_4: Carefully dilute 140 mL of conc. H_2SO_4 to 1 L with distilled water (H_2SO_4 to be slowly added to water) to get approx. 5 N H_2SO_4.

Method

1. Pipette 5mL of the extract into 25 mL volumetric flask. Add 2-3 drops of p-nitrophenol indicator. It develops yellow colour. Add known quantity of 5 N H_2SO_4 drop by drop to acidify the extract to pH 5.0 at which the yellow colour will disappear. Note the volume of 5 N H_2SO_4 used.
2. Transfer 5 mL aliquot of the extract of compost sample to a 25 mL volumetric flask and add the required quantity of 5 N H_2SO_4 to bring it to pH 5.0. Dilute to 20 mL with distilled water. Add 4 mL of the ascorbic acid solution, make the volume to 25 mL and shake well.
3. Wait for 10 minutes and then measure the colour intensity at 665 nm. Run a blank with the extracting solution (without compost).
4. Preparation of standard stock solution for the standard curve: Weigh 0.439g of AR grade KH_2PO_4 dried in oven at 600°C for 1 hour in a one liter beaker, add about 500mL of distilled water and dissolve. Add 25 mL of approx. 7 N H_2SO_4 and make the volume to one liter. This is 100mg P/L solution.
5. Standard working solution: Dilute a suitable volume of 100 mg P/L solution 50 times to get 2 mg P/ L solution. Take a series of 25 mL volumetric flasks. Pipette out 0, 0.5, 1.0, 1.5, 2.0 and 2.5 mL of 2 mg L^{-1} P solution. Add 5 mL of the extractant (water or 2% citric acid). Add ammonium molybdate and proceed to develop blue colour as described earlier. Measure the blue colour intensity and draw a standard curve by plotting the concentrations of P in µg against absorbance readings. If a straight line is obtained, find out a factor for each reading.

Calculation: Water soluble-P or citric acid soluble-P (ppm) = OD x dilution factor, where OD is optical density corresponding to concentration in ppm.

8.2.11. Cation Exchange Capacity

The cation-exchange property of a soil is due almost entirely to the clay and organic colloid fractions. It has also been shown that the application of organic material to the soil improves among other properties, its exchange capacity because of the presence of humic substances in these organic materials. Therefore, a measurement of the CEC of compost is also useful for estimating its degree of humification (Lax et al., 1986). As there is little information on methods for the determination of CEC in organic materials, its methodology is included here. The $BaCl_2$-TEA methods applied to the compost sample is as follows:

Reagents

1. Mehlich's solution 'A' (0.2N $BaCl_2$ buffered with triethanol amine (TEA) to pH 8.1), Mehlich's solution B (0.1N $BaCl_2$), Activated charcoal
2. Percolating filter (0.45 µm pore diameter cellulose ester membrane)

Method

1. One g of sample is mixed with 2g of activated charcoal and placed into a percolating filter (0.45 µm pore diameter cellulose ester membrane). Twenty five ml of CO_2 free deionized water (used throughout) are added and allowed to stand for two hours.
2. After filtering off, a further three 25 mL portions of water are added and filtered off. The filtrate is discarded.
3. The next step is percolation of 25 mL of Mehlich's solution 'A' followed by 25 mL of Mehlich's solution B (both measured accurately). A final washing is carried out with two portions of 25 mL of water and third of 75mL. All these filtrates are collected together and the amount of barium is determined by titrimetrically with 0.2N HCl.
4. Add 2 drops of bromocresol green indicator and 10 drops of the mixed indicator. Titrate with HCl to a repeatable end point in range from green to purple. A blank is also run with

determine by difference the amount of Ba^{2+} adsorbed by the sample. The adsorption of Ba^{2+} by the activated charcoal is also determined.

Calculation:

$$\text{CEC [c mol (P+)/kg]} = \frac{\text{mL HCl for blank} - \text{mL HCl for compost} * \text{Normality of HCl} * 100}{\text{Wt (g) of compost.}}$$

8.2.12 Lignin and Cellulose Content in Compost

Lignin methods based on an acid-detergent fiber pre-extraction are evaluated for compost. (Rowland and Roberts, 1994) This method involves hydrolysis of the cellulose component with 72% sulphuric acid. The acid detergent reagent dissolves most of the hemi cellulose and offers the opportunity to quantify the cellulose fraction.

Acid Detergent Fibre (ADF)

Reagent

CTAB- dissolve 50 g cetyltrimethyl ammonium bromide in 5 Lit. 0.5 M H_2SO_4

Method

1. Weight 0. 5 g of air-dried dry compost (W1) into a 250 mL conical flask.Add 100 mL CTAB solution and a few drops of octan-2-ol as an antifoam agent.
2. Place a glass bubble in the neck of the flask and simmer gently on a hot plate for 1 hour. Filter hot through an ignited and pre-weighted porosity no. 2 sinter (W2) under gentle suction.
3. Wash the residue with 3 time with 50 mL aliquots of boiling deionized water and then with acetone until no more color is removed.Suck the fibre dry and dry the sinter for 2 hour at 105^0C. Cool the material in the desiccator and weight (W3).

Calculation

$$\text{ADF (\%)} = (W3-W2) * 100/W1$$

ADF- Sulphuric Lignin

Reagent

Sulphuric acid (72 % w/v): Add 720 mL conc. H_2SO_4 to 540 mL distilled water.

Method

1. Continue the procedure following on from the ADF determination outlined above.
2. Half fill the sinter with cooled (15^0C) 72% H_2SO_4, stir with a glass rod to a smooth paste and place and in a suitable vessel

to catch the acid as it drains from the sinter. Refill with 72 % H_2SO_4 as the acid drains away and stir.

3. After 3 hours, filter off the acid under vacuum and wash the contents with hot water until free of acid. Rinse stirring rod and wash the product with acetone. Dry the sinter at 105^0 for 2 h, cool in desiccator and weigh (W4).
4. Ignite the sinter at 550^0C for 2 hours, cool in desiccators and weigh (W5).

% Lignin = (W4 – W5)*100 /W1

% Cellulose = (W2 – W4)* 100/ W1

8.2.13 Estimation of Total Heavy Metals (Cd, Cr, Pb, Ni, Hg and Zn)

Equipment and Reagents

1. Hot plate, conical flask (250 mL), Whatman filter paper No.42, Atomic Absorption Spectrophotometer

2. Tri-acid mixture: Mix 10 parts HNO_3, 1 part H_2SO_4 and 4 parts $HClO_3$

Preparation of Working Standards: Dilute 1, 2, 3 and 4 mL of standard 100 ppm Cadmium, Copper, Chromium, Lead, Nickle and Zinc standard solution with double distilled water in separate volumetric flasks and makeup the volumes to 100 mL to obtain standards having concentrations of 1, 2, 3 and 4 ppm.

Sample Preparation: Take 5.0 g or suitable quantity of oven-dried (105°C) compost sample thoroughly ground and sieved through 0.2 mm sieve in a conical flask. Add 30 mL triacid mixture; cover it up with a small glass funnel for refluxing. Digest the sample at 200°C on a hot plate until the volume is significantly reduced with a whitish residue. After cooling, filter the sample through Whatman filter paper, Make up to 100 mL in a volumetric flask (Jackson 1973).

Estimation: Estimate the metal concentrations of Cd, Cu, Cr, Pb, Ni, Zn by flaming the standards and samples using AAS as per the method given for instrument at recommended wavelength for each element. Run a blank following the same procedure.

Calculation

Express the metal concentration as mg/kg on oven dry weight basis upto 3 decimal units.

8.2.14 Estimation of Arsenic (As)

Processing of Sample - Suspend 10g finely ground sample in 30 mL aqua regia (HNO_3 + HCl in a ratio of 1:3) in a beaker. Keep on hot plate till moist black residue is obtained (do not dry). Add 5 mL aqua

regia and allow to dry on hot plate till residue is moist. Dissolve the residue in 30 mL conc. HCl and filter through Whatman No.1 filter paper in 100 mL volumetric flask. Wash filter paper 3-4 times with double distilled water. Make up the volume to 100 mL. Take 1 mL of this solution in 100 mL volumetric flask, add 5mL conc. HCl and 2 g KI and make up the volume to 100 mL

Prepare standards having conc. of 0.05, 0.1 and 0.2 ppm by diluting 0.05, 0.1 and 0.2 mL of standard Arsenic solution with double distilled water in a volumetric flask and make up the volume to 100 mL.

Measurement - Estimate Arsenic using vapor generation assembly attached to Atomic Absorption Spectrophotometer as per the procedure given for the instrument.

Calculation

Express the metal concentration as mg/kg on oven dry weight basis upto 3 decimal units.

8.2.15 Estimation of Mercury (Hg)

Equipment and Reagents

1. Water bath, Flameless AAS (AAS attached with vapor generation assembly) or cold vapor mercury analyzer, BOD bottle (300 mL).
2. Conc. nitric acid (HNO_3) and conc. sulphuric acid (H_2SO_4).
3. Potassium persulphate (5% solution); Dissolve 50g of $K_2S_2O_8$ in 1 liter of distilled water.
4. Potassium permanganate (5% solution): Dissolve 50 g of $KMnO_4$ in 1 liter of distilled water.
5. Hydroxylamine sodium chloride solution: Dissolve 120 g of Hydroxylamine salt and 120 g of sodium chloride (NaCl) in 1 liter of distilled water.
6. Stannous chloride (20%): Dissolve 20 g of $SnCl_2$ in 100 mL distilled water.

Processing of Sample: Take 5 g (finely ground but not dried) sample in oven at temperature of 105° C for 8 hours for moisture estimation. Take another 5 g sample (finely ground but not dried) in a BOD bottle, add to it 2.5 mL of conc. HNO_3, 5 mL of conc. H_2SO_4 and 15 mL of 5% $KMnO_4$. After 15 min. add 8mL of 5 % $K_2S_2O_8$. Close the bottle with the lid and digest it on the water bath at 95° C for 2 hours. After cooling to room temperature add 5 mL Hydroxylamine sodium chloride solution.

Measurement: Reduction of digested sample is carried out with 5 mL of 20 % $SnCl_2$ immediately before taking the readings, using a cold vapor mercury analyzer or AAS.

Calculation: Express the mercury concentration as mg/kg on oven dry weight basis in 3 decimal units.

8.3 Biological Tests (Pathogenicity Test)

Under this category, three types of tests are done. These are the (i) presumptive test, (ii) confirmatory test and (iii) the completed test.

Equipments and Materials Required for all three tests are: Lactose Broth of Single and Double Strength, Culture Tubes, Durham Tubes, Bunsen Burner, Sterile Pipettes, Incubator, Autoclaves, Petri-Plates, Inoculation Loops.

Preparation of Culture Media and Methodology

8.3.1 Presumptive Test

Materials and Methodology

Lactose broth: Beef extract 6.0 g, Peptone10.0g, Lactose 10g, Distilled water 1000mL.

Method for Presumptive test

1. Prepare 12 tubes of lactose broth for each sample and close the tube with cotton plugs/caps and autoclave at 121 °C for 20 min. Fill Durham tubes with sterilized distilled water and keep in beaker and autoclave at 121°C for 20 min.
3. Suspend 30g of compost sample in 270mL of sterile distilled water and serially dilute up to 10^{-4} dilution. Suspend 1 mL suspension from 10^{-1} to 10^{-4} in 3 tubes for each dilution
4. Insert distilled water filled Durham tube in inverted position in each tube and close the tube again. Inoculate tubes at 36°C for 24h in incubator

Result

Production of gas within 24h - confirms the presence of coliforms in the sample
Production of gas within 48h- Doubtful Test
No gas production - Negative Test

8.3.2 For Confirmative Test

Confirmative test is for differentiating the coliforms with that of non-coliforms as well as Gram -ve and Gram +ve bacteria. In this test, the EMB agar plates are inoculated with sample from positive tubes producing gas. Emergence of small colonies with dark centres confirms the presence of Gram -ve lactose fermenting coliform bacteria. Some times the non-coliforms also produces gas, therefore, this test is necessary.

Materials and Methodology

Eosine Methylene Blue Agar Media (EMB Media): Peptone 10.0 g, Lactose 5.0 g, Sucrose 5.0 g, K_2HPO_4 2.0 g, Eosine Y 0.4 g , Methylene Blue 0.06 g, Agar 15.0 g, D.W. 1000 mL.

Methodology

1. Prepare EMB agar plates.Inoculate plates with the help of inoculation loop with streaking of samples showing positive/doubtful tests in the presumptive test. 3. Incubate plates at 30±1°C for 12 h in incubator.

Result

Dark centered or nucleated colonies appear which may differentiate between *E.coli* and *E. aerogenes* based on size of colonies and metallic sheen *E.coli* colonies on this medium are small with metallic sheen, whereas *E. aerogenes* colonies are usually large and lack the sheen.

8.3.3 For Completed Test

This test is required for the further confirmation of pathogenicity.

Materials and Methodology

Nutrient Agar: Beef Extract 3.0 g, peptone 5.0 g

Methodology

Pick up a single colony from EMB agar plate. Inoculate it into lactose broth and streak on a nutrient agar slant. Incubate the slants and finally, perform Gram reaction after attaining the growth.

Result

Gram –ve nature of bacteria is indicative of a positive completed test.

8.4 Some Dos and Don'ts During Analysis

Dos	Don'ts
✓ Conduct periodical calibration of equipments, weighing balances and glasswares.	× Do not return the liquid reagents after they have been taken out from the bottle.
✓ Label all chemicals and reagents clearly.	× Do not boil the sample during digestion with acid to dryness at any stage. It may cause explosion.
✓ Clean all glasswares with distilled water and dry.	× Do not eat, drink or smoke in the working area/ laboratory.
✓ Use safety spectacles while drying samples with acid.	× Do not work in a laboratory without lab coat and gloves.
✓ Keep fully stocked first aid box ready at an easily reachable place.	× Does not mouth pipette dangerous chemicals. Ethidium bromide is powerful mutagen. Avoid contact with
✓ Display list of safety precautions and use of antidotes in a prominent place.	
✓ Use great care in evaporating perchloric acid as it is very explosive.	

Dos	Don'ts
✓ Store solutions which are unaffected by exposure to air in glass bottles.	hand and skin. Use gloves.
✓ Store oxidizing chemicals like iodine and silver nitrate only in amber (brown) colour glass containers.	× Do not throw any corrosive or hazardous disposables in the common dust bin.
✓ Store EDTA solution in hard polythene containers.	× Do not forget to properly cover all instruments at the end of the day.
✓ Use distilled water for routine analysis only and double distilled water for micronutrient analysis.	× Do not leave any bottles, containers open after these have been used.
✓ Always carry out duplicate analysis of each sample and run one blank determination along with sample.	× Do not turn on any electric switch in case of leakage of an inflammable gas.
✓ Always test for complete precipitation in gravimetric analysis.	
✓ Use fume hood/cupboard for evaporation during digestion.	
✓ Ensure proper wavelength/filter for spectrophotometric/colorimetric analysis.	
✓ Periodically check absorbance scale with standard solution.	
✓ In case of samples containing large quantities of organic matter, temperature should be raised to fuming point (approximately 170^{0}C) over a period of 1 hour at least.	
✓ Discard all the waste of living organisms i.e. agar plates, culture etc. only after autoclaving.	
✓ Wash your hands and clean your working area with disinfectant before starting and after finishing work.	
✓ Fingers contain nucleases and dust contains microorganisms, heavy metal etc. Keep the laboratory environment dust free.	

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Table 1: Soil Analysis/Testing Rates (Rupees per sample)

Parameters	Up to 20 samples (X)		More than 20 samples (Y) (Y=X+)		More than 50 samples (Z) (Z=Y+)		More than 100 samples (T) (T=Z+)		Per sample
	A	B	A	B	A	B	A	B	C
pH	25	20	20	15	15	10	10	10	
EC	25	20	20	15	15	10	10	10	
pH +EC	40	35	35	25	25	15	15	15	
WB-C	150	125	125	100	100	75	75	75	
Av. N	100	75	75	50	50	40	40	40	
Av. P	150	125	125	100	100	75	75	75	
Av. K	100	75	75	50	50	40	40	40	
Av. S	150	75	75	50	50	40	40	40	
WB-C+ Av. NPKS	500	400	400	325	325	225	225	200	
Av. Zn	200	150	175	125	150	100	100	100	
Av. Cu	200	150	175	125	150	100	100	100	
Av. Fe	200	150	175	125	150	100	100	100	
Av. Mn	200	150	175	125	150	100	100	100	
Av. B	200	150	175	125	150	100	100	100	
Av. Zn Cu Fe Mn B	750	600	650	550	600	500	500	500	
Soil Testing package (Without micronutrients)	525	425	425	325	300	200	200	200	250
Soil Testing package (With micronutrients)	1000	900	800	700	700	600	600	600	500
TOC	200	150	175	125	150	100	100	100	
Total N	200	150	175	125	150	100	100	100	
Total P	200	150	175	125	150	100	100	100	
Total K	200	150	175	125	150	100	100	100	
Total S	200	150	175	125	150	100	100	100	
TOC+ Total NPKS	750	600	650	550	600	500	500	500	
Total Zn	250	200	200	150	175	125	150	100	
Total Cu	250	200	200	150	175	125	150	100	
Total Fe	250	200	200	150	175	125	150	100	
Total Mn	250	200	200	150	175	125	150	100	
Total Zn Cu Fe Mn	750	600	650	550	600	500	500	500	
Microbial count									
Heterotrophs	200	150	175	125	150	100	100	100	
N fixers	200	150	175	125	150	100	100	100	
P solubilizers	200	150	175	125	150	100	100	100	

ICAR Indian Institute of Soil Science
Nabibagh, Berasia Road, Bhopal-462038

Date: 24.08.2015

Note

The committee constituted by the Director vide F.No. 12-144/2014-Estt. dated 18.05.2015 for making a system for analysis of the plant and soil samples of other than ICAR/Institute and fixing the rates of various analysis met several times during the last few months. After through discussion, deliberations and consultations on analysis rates of other soil based institutes the committee devised a draft proposal for single window system for all analysis of soil and plant samples, and also fixed rates for the same. I am enclosing herewith the rates for analysis of different soil and plant parameters and the single window system for making the analysis and reporting.

Submitted for information, perusal and n/a, pl.

(A.K. Biswas)
Chairman

Director, IISS, Bhopal

Methanotrophs	200	150	175	125	150	100	100	100
Fungi	200	150	175	125	150	100	100	100
Actionomycetes	200	150	175	125	150	100	100	100
Enzymatic								
FDA	500	400	450	350	400	300	300	250
DHA	500	400	450	350	400	300	300	250
Nitrogenase (ARA)	500	400	450	350	400	300	300	250
GHF analysis								
CH4	500	400	450	350	400	300	300	250
CO2	500	400	450	350	400	300	300	250
N2O	500	400	450	350	400	300	300	250

A. Private Institutions/Individuals
B. Non-ICAR/ SAU Govt. Institution
C. Individual farmers

Table 2: **Model Calculation for soil/ plant analysis based on Table 1 rates**

Parameters	20 samples (Rs.)		50 samples (Rs.)		100 samples (Rs.)		200 samples (Rs.)	
	A	B	A	B	A	B	A	B
pH	500	400	1100	850	1850	1350	2850	2350
EC	500	400	1100	850	1850	1350	2850	2350
pH +EC	800	700	1850	1450	3100	2200	4600	3700
WB-C	3000	2500	6750	5500	11750	9250	19250	16750
Av. N	2000	1500	4250	3000	6750	5000	10750	9000
Av. P	3000	2500	6750	5500	11750	9250	19250	16750
Av. K	2000	1500	4250	3000	6750	5000	10750	9000
Av. S	3000	1500	5250	3000	7750	5000	11750	9000
WB-C+ Av. NPKS	10000	8000	22000	17750	38250	29000	60750	49000
Av. Zn	4000	3000	9250	6750	16750	11750	26750	21750
Av. Cu	4000	3000	9250	6750	16750	11750	26750	21750
Av. Fe	4000	3000	9250	6750	16750	11750	26750	21750
Av. Mn	4000	3000	9250	6750	16750	11750	26750	21750
Av. B	4000	3000	9250	6750	16750	11750	26750	21750
Av. Zn Cu Fe Mn B	15000	12000	34500	28500	64500	53500	114500	103500
Soil Testing package (Without micronutrients)	10500	8500	23250	18250	38250	28250	58250	48250
Soil Testing package (With micronutrients)	20000	18000	44000	39000	79000	69000	139000	129000
TOC	4000	3000	9250	6750	16750	11750	26750	21750
Total N	4000	3000	9250	6750	16750	11750	26750	21750
Total P	4000	3000	9250	6750	16750	11750	26750	21750
Total K	4000	3000	9250	6750	16750	11750	26750	21750
Total S	4000	3000	9250	6750	16750	11750	26750	21750
TOC+ Total NPKS	15000	12000	34500	28500	64500	53500	114500	103500
Total Zn	5000	4000	11000	8500	19750	14750	34750	24750
Total Cu	5000	4000	11000	8500	19750	14750	34750	24750
Total Fe	5000	4000	11000	8500	19750	14750	34750	24750
Total Mn	5000	4000	11000	8500	19750	14750	34750	24750
Total Zn Cu Fe Mn	15000	12000	34500	28500	64500	53500	114500	103500
Microbial count								
Heterotrophs	4000	3000	9250	6750	16750	11750	26750	21750
N fixers	4000	3000	9250	6750	16750	11750	26750	21750
P solubilizers	4000	3000	9250	6750	16750	11750	26750	21750
Methanotrophs	4000	3000	9250	6750	16750	11750	26750	21750
Fungi	4000	3000	9250	6750	16750	11750	26750	21750
Actionomycetes	4000	3000	9250	6750	16750	11750	26750	21750

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Enzymatic activities								
FDA	10000	8000	23500	18500	43500	33500	73500	58500
DHA	10000	8000	23500	18500	43500	33500	73500	58500
Nitrogenase (ARA)	10000	8000	23500	18500	43500	33500	73500	58500
GHG analysis								
CH_4	10000	8000	23500	18500	43500	33500	73500	58500
CO_2	10000	8000	23500	18500	43500	33500	73500	58500
N_2O	10000	8000	23500	18500	43500	33500	73500	58500

A. Private Institutions/Individuals
B. Non-ICAR/ SAU Govt. Institution

System for Soil and Plant Analysis

There has to be a single window system where all the samples would be received. A nodal officer preferably from Training cum Referral lab may be appointed for the purpose. The nodal officer would be responsible for receiving the samples, ascertain the nature and purity/representativeness of samples, facilitating the payment for analysis by the client, allocating the samples and getting the results from different laboratories, and reporting back to the client in a time bound manner.

Sample should be classified: Farmer, NGO, Government, University, Private, and ICAR/SAU. Requisite rate as per classification may be fixed and indicated to the clients.

Facilities to be provided to Nodal Officer: In view of the scarcity of manpower in the institute, committee feels that institute should employ an assistance/help (Graduate) and two skilled laborers.

For samples other than farmers and ICAR/SAUs, honorarium may be paid to analysts (Tech. Officer/Scientist), and other concerned as per ICAR guidelines.

Parameters and laboratories for analysis of plant and soil samples

	Parameter	Laboratory
Soil	pH, EC, OC, Available N	Referral lab
	CEC, Available P, K, S,	Soil Chem. & Fertil
	Available Micronutrients & Ex. Ca, Mg	PC (M)
	Heavy metals	ESS
	Texture, porosity, bulk density, water holding capacity	SPD
	Soil microbial biomass, dehydregenase activity phosphatase activity urease activity FDA	Soil biology
Plant/Compost	Carbon, N	Referral lab
	P, K, S	Soil Chem. & Fertil
	Micronutrients & Ca, Mg	PC (M)
	Heavy metals	ESS
	C/N ratio, lignin content	Soil biology
GHG	CO_2, CH_4, N_2O	Central lab
Microbial	Microbial count of heterotrophs, P solubilizers, N fixers, methanotrophs, actinomycetes, fungi	Central lab

All other modalities regarding sample size, terms and conditions, analytical protocol, time frame, etc. may be decided by the nodal officer in consultation with all laboratory in-charges involved in analysis.

(A.K. Biswas)
Chairman

(S. Srivastava)
Member

(Tapan Adhikari)
Member

(S.R. Mohanty)
Member

(Rajesh Dubey)
Member

The Right to Information Act 2005
Application for obtaining information

दानकी सं. 3778 /अवर सचिव(कृ.वि.)
Dy. No...../Under Secretary (Agri. Extn)
दिनांक/Date...03/12/16.....

From
Shankar Lal
Parthvimeda Gau Pharma village- Pathmeda ,
Sanchore-343041Rajasthan
Phone: 8890067990

To
The Public Information Officer
Under Secretary (Agri. Extn)
Indian Council of Agricultural Research,
Krishi Bhawan,
New Delhi-110001
Ph-25841081

कृषि भवन-I
Krishi Bhawan-I
Dy. No. 23/RTI/Agril. Extn.-I
दिनांक/Dated 08/12/2016

SUB : The test procedure of organic manure

Dear Public Information Officer:

Under the Right to Information Act 2005,Section 6, I need some information. The details of the information are as follows

1. Details of the applicant

Name : Shankar Lal
Email : panwarshankar.lal@gmail.com
Phone : 8890067990
Address : Parthvimeda Gau Pharma village- Pathmeda ,
Sanchore-343041Rajasthan

2. Period to which the information relates: Latest

3. Details of Information

Please provide the following information:

1) The test procedure of "organic manure" in ICAR.

R 71
(Sci matter) AE-I
NM
8/12

2) As per your rules, the timeline required for complete testing of one sample.

3) How to adjust the final report if we get two different test data of the same sample.

4. Application fee details

Encl. Application Fee of Rs 10/- by IPO No.39F-931065 Pay To: Accounts Officer

5. Below Items are for your kind information and consideration

a. As per section 6(3) of the RTI Act 2005, In case, the requested information is held by another public authority,I request the PIO to transfer the application or part of it within FIVE days and immediately inform me about such transfer.

b. As per section 7(3) of the RTI Act 2005, In case, there are further fee required to provide the requested information, I request the PIO to inform me of the additional fee amount along with the calculations made to arrive at the amount.

c. As per section 7(8)(iii) and 7(3)(ii) of the RTI Act 2005, I request the PIO to inform me of the particulars of First Appellate Authority.

6. Declaration

I declare that I am a citizen of India/PIO or OCI Card Holder.

Yours faithfully,

Shankar

Thursday, December 1st 2016