Kentucky Method 64-241-0~~82~~
Revised ~~12/27/02~~04/15/08
Supersedes 64-421-0~~20~~
Dated ~~1/13/00~~12/27/02

FERTILIZER

1. SCOPE: This method covers fertilizers used in preparing seed beds and shall be carriers of available plant food elements or combinations thereof, either as organic or inorganic materials. The fertilizer shall be standard commercial fertilizer supplied separately or in mixtures containing the percentages of total nitrogen, available phosphoric acid, and water-solubles potash specified in the contract. The fertilizer and labels shall conform to all existing state and federal regulations. Any fertilizer which becomes caked, or otherwise damaged as to make it unsuitable for use, will not be accepted.

2. APPARATUS AND MATERIALS:

   2.1. 300 µm (No. 50) sieve

   2.2. 500 ml Kjeldahl Flasks

   2.3. Tri-N Butyl Citrate

   2.4. Hydrochloric Acid

   2.5. Digestion Mixture containing 10 g K_2SO_4, 0.2 g Se, 0.6 g HgO, 0.5 g $CuSO_4$ and 1.5 g Alundum.

   2.6. Sulfuric Acid

   2.7. Sodium Thiosulfate (160 g $Na_2S_2O_3.5H_20$/liter)

   2.8. 50% Sodium Hydroxide

   2.9. 0.5 NH_2SO_4

   2.10. Boric Acid (saturated solution)

   2.11. Apparatus and Materials that appear in AOAC methods 2.023 and 2.083.

   2.12. N-Point Indicator

   2.13. Mossy Zinc

3. SAMPLE:

3.1. One 0.95 liter (quart) sample per type per source will be submitted to the ~~Central Laboratory~~Division of Materials, and results obtained before permitting use. If possible, a tube sampler shall be used to obtain samples. If quantity is less than 10 bags, each bag will be sampled and combined to form a 0.95 liter (quart) sample. If more than 10 bags, select 10 bags and sample, combining to make a 0.95 liter (quart) sample.

3.2. Fertilizer may be accepted on the basis of written certifications by the vendor and by the contractor, or on the basis of sampling and testing by the ~~Bureau~~Cabinet. If certifications are used, they shall be prepared and presented in triplicate to the engineer at the time of delivery of the fertilizer. In the event the engineer has reason to believe that the fertilizer has become contaminated, or is otherwise questionable, it shall be sampled and tested prior to use.

4. PROCEDURE:

4.1. Preparation: The sample should be reduced to about 100 grams by use of a sand splitter. This portion is ground in an iron mortar and pestle until the entire sample passes a 300 µm (No. 50) sieve. Care should be taken to prevent any change in moisture content during grinding and sieving. The sample is stored in a sample jar with a tight fitting cap.

4.2. Nitrogen:

4.2.1. Weigh, by difference, a sample containing not more than 60 mg of nitrogen as nitrate, and transfer to a 500 ml Kjeldahl flask. Add 1.2 g of chrominum powder and 35 ml of distilled water. Allow the mixture to stand for 10 minutes with occasional swirling to insure solution of all nitrate in the sample. Add 7 ml of concentrated HC1 and 2 - 3 drops of Tri-N-Butyl Citrate. Let the mixture stand until visible action occurs. This requires 1 - 5 minutes. Place the flask over a Bunson burner that has been pre-set to give a 5-minute boil. The maximum heating time is 5 minutes. Remove flask from heat, and allow to cool.

4.2.2. Add 12.8 g of digestion mixture which contains the following: 10 g of K_2SO_4, 0.2 g Se, 0.5 g HgO, 0.5 g $CuSO_4$ and 1.5 g alundum. Add 25 ml of concentrated H_2SO_4. Place the flask over a pre-tested burner regulated to give a 5-minute boil time. Allow 15-20 minutes for the copious white fumes to clear out of the bulb of the flask. Swirl gently. Digest for an additional 30 minutes.

4.2.3. Allow the flask and contents to cool to room temperature. Place a 400 - 500 ml beaker containing 100 ml of saturated boric acid solution under discharge tube of condenser (standard Kjeldahl distillation apparatus). Dilute sample to 300 ml with distilled water, and add 25 ml of sodium thiosulfate solution (160 g $Na_2S_2O_3.5H_2O$

per liter). Add a few pieces of zinc to prevent bumping. Add 100 ml 50% NaOH. Add NaOH slowly while holding neck of flask at about 45° angle. Attach flask, with gentle swirling movement, to condenser of the distillation apparatus. Heat gently at first. After boiling begins increase the heat. Distill over at least 150 ml. Use 7 - 9 drops of N-end point indicator in the boric acid receiving solution. Titrate NH_3 with standard H_2SO_4 0.5 N solution.

4.2.4. A blank determination should be made to correct for the trace amount of N_2 present in chromium powder.

4.2.5. Calculations:

$$\frac{[mL\ H_2SO_4\ (Sample) - mL\ H_2SO_4\ (Blank)] \times N \times 1.4008}{Weight\ of\ Sample} = \%\ Nitrogen$$

4.3. Phosphate: AOAC 2.024

4.4. Potash: AOAC 2.083

5. CALCULATIONS: Calculations are covered in the Procedures.

6. PRECAUTIONS: Precautions are covered in the Procedures.

7. REPORT:

7.1. % Nitrogen

7.2. % Available Phosphoric Acid

7.3. % Potash

APPROVED _____
DIRECTOR
DIVISION OF MATERIALS

DATE 04/15/08

~~APPROVED _____~~
~~Director~~
~~DIVISION OF MATERIALS~~

~~DATE 12/27/02~~

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