Indian Journal of Research in Pharmacy and Biotechnology
Volume 5, Issue 3, 2017
Journal homepage: http://www.ijrpb.com

ISSN:
2321-5674 (Print)
2320-3471 (Online)

Research article

Indexed in CAS and CABI
Impact factor:0.64

Soil analysis of Pothavaram village, Prakasam district, Andhra Pradesh, India for the determination of Organic Matter, Sulphur, Zinc and Boron

S.Muttareddy*, KPPR Mohan Reddy
Government college for women, chirala, Prakasam District, Andhra Pradesh, India.
***Corresponding author: Dr.S.Muttareddy, Reader in Chemistry, Government college for women, Chirala, Andhra Pradesh, India.**

Keywords:
Soil Analysis, Organic matter, Sulphur, Zinc and Boron
Article Info:
Received: 20-02-2017
Revised: 07-03-2017
Accepted: 30-03-2017

ABSTRACT

Soil analysis was conducted in Pothavaram village, Prakasam District, Andhra Pradesh, India, for the determination of Organic matter, Sulphur, Zinc and Boron. Soil analysis is a useful tool for the estimation of micro and macro nutrients in the soil. These are very essential for the growth of the plats. Soil analysis is used for the selection of crop for the particular area depending on the nutrients available in the soil. In the present study micro nutrients like Sulphur, Zinc and Boron were studied by employing standard procedures and the results were given.

1. INTRODUCTION

Soil and water are the greatest natural resources gifted to mankind. Our country basically depends upon agriculture, thus it becomes more so important study, analyse and effectively manage "soil". Soil being the basic media for the plants to stand and grow and water becomes the lifeline to the plants. In view of this, a greater importance has been attached for management of soil and water by way on analysis, there by contributing increased productivity in modern agriculture. The objectives of the study are 1.

To estimate the available nutrient status, reacting of the soil.To determine accurate doses of nutrients to the applied for a particular soil to avoid excessive fertilizer application and bring down expenditure on fertilizers. Determining the presence or absence of abnormal soil conditions such as salinity, alkalinity or acidity, determine their magnitude & suggest ameliorants for reclamation. To evaluate the fertility status of a country or a state or a district or a field and prepare soil fertility maps for fertilizer recommendation. To bring awareness about importance of soil and water testing among the forming community for increased yields/returns. To assess and estimate the quality of water, its suitability to various crops depending upon the source and place.

2. MATERIALS AND METHODS

The soil testing programme involves collection of soil samples, chemical analysis of samples, calibration and interpretation of the results of chemical analysis and recommendations.

Collection of soil samples: As it is well known. 'The analysis can be no better than the sample'. The analysis performed very preciously becomes meaningless, if the soil sample is not collected properly duly following the procedure. Therefore, the collection and preparation of soil sample should be done with perfection. The soil sample collected should be true representative of the area sampled not more then 5-10 acres (2-4ha). A field can be treated as a single sampling unit only. It is appreciable, uniform in all respects. Variation in slope, texture, color, crops grown and management levels followed should be taken into account. Separate sets of composite samples need to be collected from each such area. For field crops, a sampling depth of 15-20 cm is desired. For deep-rooted crop like sugarcane, horticultural crops etc., sub-soil should be from different depths or layers for every one feet, up to six feet, may be needed and sampled separately.

In saline-alkali soils, salt crust (visible or suspected) on the soil surface should be sampled separately. Where crops have been planted in lines, sampling may be done between the lines. Recently fertilized plots, bunds, channels, marshy tracts and spots near tree, wells etc., must be avoided during sampling. Under intensive cultivation, sampling should be done every year. If one crop/year is raised sampling once in 3 years is sufficient. Sampling should be done at the same time each year. Proper sampling tool should be used. Samples can be satisfactorily taken with a soil/probe/tube, an auger, a spade, shovel or pick axe and clean the tools before taking another sample. A composite sample has

to take from each area. After scrapping the surface litter, a uniform slice of soil from the surface to plough depth (15 to 22cm deep). If a spade is used, a V-shaped cut may be first made up to the plough layer and a uniform 1.5 cm thick slice taken out. Individual slices should be collected in a clean container/bucket. All lumps should be broken and mixed well in the container or on a clean cloth. The size of the composite sample should be reduced by successive quartering to about half a kilogram to one kilogram. The sample should be dried in shade before putting it in to the cloth bag and dispatch it to the nearest soil testing laboratory by enclosing the information sheet.

3. RESULTS AND DISCUSSION

Determination of organic carbon: One gram of the soil sample is taken in a test tube. To this add 2ml of 1N potassium dichromate and 2 ml of conc.H_2SO_4. shake and keep it for about half-an-hour and allow for the completion of the oxidation. Then add 5 ml distilled water and the colour developed is noted as Light Yellow, Yellow, Orange, Olive Green, Bluish Green.

Table.1.Determination of organic carbon

Colour	Range	Oc%
Light Yellow	Very Low	<0.3
Yellow	Low	0.3-0.5
Orange	Medium	0.5-0.75
Olive Green	High	0.75-1.0
Bluish Green	Very High	>1.0

Determination of Sulphur: Take two grams of soil in a bottle having lid. To that add two spinges of charcoal powder. For that add 10ml of sulphur 1 reagent and put the lid and shake it horizontally for five minutes after that three minutes kept aside. Take filter paper and molded and kept in funnel and filtered the above solution. After that leached with distilled water. To that filtrate add sulphur reagent 2 three to four drops and shake well. A white milk like precipitate is obtained. This is compared with standard chart of sulphur and from that sulphur is estimated.

Determination of Zinc: Take two grams of soil in a bottle having lid. To that add two spinges of charcoal powder. To that add 10ml of zinc reagent 1 and keep the lid strongly and shake the bottle for five minutes horizontally and kept aside for three minutes then filtered. The filtration is taken into the test tube and to that add 10ml of zinc 2 reagent. After that add three spinges of zinc 3 reagent and shake well and test tube is kept for five minutes. This colour is compared with the standard chart of zinc. From that zinc is estimated.

Determination of Boron: Take two grams of soil in a bottle having lid. To that add two spinges of charcoal powder and 10ml of boron reagent 1 and keep the lid strongly and shake the bottle for five minutes horizontally and kept aside for three minutes then filtered. The filtration is taken into the test tube and to that add 1ml of boron2 reagent and shake well. After that 1ml of boron 3 reagent is added. To that three spinges of boron 4 chemical is also added and shake well. After that the test tube is kept for five minutes and the colour is compare with the standard chart of boron. This colour is compared with the standard chart of zinc. From that zinc is estimated.

Table.3.Nutrient Content in the Soil

Name of the Farmer	Organic Matter			Sulphur			Zinc			Boron		
	Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	High	Medium
P.Anji Reddy	--	--	*	*	--	--	--	*	--	--	--	*
Y. Ravi Chandra	--	--	*	--	*	--	--	*	--	--	--	*
K. Ankaiah	--	--	*	--	*	--	--	*	--	--	--	*
Hanumanth Rao	--	--	*	*	--	--	--	*	--	*	--	--
M. Jaya Rao	--	--	*	*	--	--	--	*	--	*	--	--
M. SubbaRao	--	--	*	--	*	--	--	*	--	*	--	--
M. Seshaiah	--	--	*	--	*	--	*	--	--	*	--	--
M. Anju Reddy	--	--	*	--	*	--	*	--	--	--	--	*
K. Subbu Reddy	--	--	*	*	--	--	--	*	--	--	--	*
P. Anjaiah	--	--	*	--	*	--	*	--	--	--	--	*

-- = Absent; *= Present
Sulphur: Low= 0.1 ppm; Medium= 10-15 ppm; High=>15
Zinc: Low=0.5 ppm; Medium:0.5 to 7 ppm; High: > 7 ppm
Boron: Low = 0.5 ppm; Medium:0.5 to 5 ppm; High: > 5 ppm

4. CONCLUSION

In the above 10 samples Organic carbon is sufficiently available. Sulphur is not sufficient in four samples. So we suggest that use Zinc sulphate as a fertilizer for the deficient samples. Zinc is deficient in three samples. Hence we suggest that they must be used Zinc sulphate as fertilizer. Also boron is deficient in four samples. They also directed to spray the Sodium tetra borate on plants.

REFERENCES

1. Helias A. Udo de Haes, Roelf L. Voortman, Ton Bastein, D.W. (Wim) Bussink, Carin W. Rougoor, Wouter J. van der Weijden, Scarcity of micronutrients in soil, feed, food, and mineral reserves:Urgency and policy options, Platform for Agriculture, Innovation & Society, 2012.

2. Westerman, R.L, Soil testing and plant analysis, Soil Sci. Soc, Amer., Madison, WI, 1990, 784.

3. Vitosh ML, Warnke DO, and Lucas RE, Secondary and micronutrients for vegetable and field crops, Michigan State University Extension Bul, 1994, 486.