International Journal of Agricultural Sciences
Volume 12 | Issue 2 | June, 2016 | 227-229 ■ e ISSN-0976-5670
☞DOI:10.15740/HAS/IJAS/12.2/227-229
Visit us : *www.researchjournal.co.in*

RESEARCH PAPER

Distribution of available iron, manganese, zinc and copper in National Seed Project Farm of Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh

GOVIND SINGH*, BINOD KUMAR[1], KAMLESH KUMAR NISHAD[2] AND RAJESH KUMAR
Remote Sensing Applications Centre, Jankipuram, LUCKNOW (U.P.) INDIA
(Email : sgovind1087@gmail.com)

Abstract : National Seed Project farm soils of Nadradra Deva University of Agriculture and Technology, Kumarganj Amaniganj block, Faizabad district of Uttar Pradesh were studied, the surface soils have soil reaction of all farm was alkaline, the organic carbon content in all the farms was low to medium and zinc, manganese and cupper were medium while iron were low in category all National seed project farms.

Key Words : NSP farm, Micronutrient

View Point Article : Singh, Govind, Kumar, Binod, Nishad, Kamlesh Kumar and Kumar, Rajesh (2016). Distribution of available iron, manganese, zinc and copper in National Seed Project Farm of Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad, Uttar Pradesh. *Internat. J. agric. Sci.*, **12** (2) : 227-229, **DOI:10.15740/HAS/IJAS/12.2/227-229.**

Article History : Received : 16.01.2016**; Revised :** 16.02.2016**; Accepted :** 19.04.2016

INTRODUCTION

In recent year, adoption of high yielding varieties and use of high analysis NPK fertilizers led to decline in the micronutrient status in soil to below normal at which productivity of crops cannot be sustained (Kumar and Babel, 2011). In India the land resources available for agriculture are shrinking. Our aim of optimizing the utilization of land resources with intensification of agriculture resulted either in the fast depletion of nutrients or occasionally in their accumulation. It is therefore, important to monitor the micronutrient status of soil from time to time with a view to monitor the soil health. For the sustainable use of the natural resources, a detailed charter of land resources giving its potential and constraints becomes pre-requisite for planning.

MATERIAL AND METHODS

Geographically, National seed project farm is located at Nadradra Deva University of Agriculture and Technology, Kumarganj, District Faizabad,Uttar Pradesh is situated at $26^0$34.011'N latitude and $081^0$47.747'E longitude to $26^0$35.061'N latitude and $081^0$45.858'E

*** Author for correspondence:**
[1]Krishi Vigyan Kendra, KANNAUJ (U.P.) INDIA
[2]Department of Agronomy, Narendra Deva University of Agriculture and Technology, Kumarganj, FAIZABAD (U.P.) INDIA

longitude with an elevation of about 113 amsl in the central Ganga Plain. The total one hundred sixty surface soil samples were collected for the study area from all the five farm units of NSP farms depth of 0-25cm at a grid 100 × 100 meter interval. The collected soil samples were processed and analysed for pH and electrical conductivity (EC) employing the method (1:2.5:: soil: water) as outline by Chopra and Kanwar (1976), organic Carbon (potassium dichromate and sulphuric acid) method described by Walkley and Black (1934), particle size distribution of soil samples were outline by Bouyoucos hydrometer method as described by Bouyoucos (1927) using sodium hexametaphosphate as dispersing agent. The DTPA-extractable Fe, Zn, Mn and Cu were extracted with di-ethylene tri-amine penta-actic acid (DTPA) solution in soil by atomic absorption spectrophotometer.

RESULTS AND DISCUSSION

Results showed that soils varied widely in their soil properties and available micronutrients (Table 1). Clay content values ranged in unit I from 24.40 to 32.40 per cent, unit II 18.50 to 21.60, farm unit III 26.60 to 28.80, farm unit IV 13.40 to 20.60 and in farm unit V 21.20 to 30.40 per cent. The clay was high in the farm units IV and V compared to other (Roy and Landey, 1962). The pH values ranged from 8.66 to 10.39, 8.23 to 10.20, 7.10 to 9.50, 7.80 to 9.78 and 7.13 to 9.90 in farm unit I, II, II, IV and V, respectively. Most of the study area was under saline to alkaline range. However, the soils of farm unit III, IV, and V were relatively low in pH than of unit I and II soils (Sivasankaran *et al.*, 1993).The electrical conductivity (EC) values ranged from 0.13 to 1.15, 0.26 to 1.68, 0.03 to 0.66, 0.10 to 0.80 and 0.16 to 0.70 dSm^{-1} in farm unit I, II, III, IV and V, respectively. The soils of unit III were low in EC as compared to farm unit I, II, IV and V soils. The organic carbon content values ranged from 0.70 to 4.90, 0.60 to 4.70, 0.90 to 4.70, 0.60 to 4.80 and 0.80 to 5.10 g per kg in farm unit I, II, III, IV and V, respectively. All the soils of the study area fell under low in organic carbon category (Walia and Rao, 1996). The organic carbon was little higher in the soils of unit V in comparison to other farm units. The reason for low organic carbon content in these farms soils might be attributed to the prevalence of tropical condition, where the degradation of organic matter occurs at a faster rate coupled with little or no addition of organic manures and low vegetative cover on the fields, thereby, leaving less chances of accumulation of organic carbon in the soils. Similar results were obtained by Nayak *et al.* (2002). The available zinc content ranged from 0.40 to 0.90, 0.50 to 0.90, 0.60 to 0.90, 0.60 to 0.90 and 0.60 to 0.90 mg per kg in farm unit I, II, III, IV and V, respectively. All the soils of national seed project farm fell under medium in available zinc category. The farm unit I was relatively low in available zinc as compared to farm unit II, III, IV and V. The available manganese content ranged from 1.00 to 5.00, 2.00 to 6.00, 2.00 to 5.00, 1.00 to 6.00 and 2.00 to 6.00 mg per kg in farm unit I, II, III, IV and V, respectively. All the soils of national seed project farm fell under medium to high in available manganese category. The farm unit I was relatively low in available manganese than farm units II, III, IV and V. The available cupper content ranged from 0.10 to 0.60, 0.20 to 0.60, 0.20 to 0.50, 0.20 to 0.60 and 0.20 to 0.60 mg per kg in farm unit I, II, III, IV and V, respectively. All the soils of national seed project farm fell under medium in available

Table 1 : Soil properties and available micronutrients status of national seed project farm soils

Soil test parameters	Unit I		Unit II		Unit III		Unit IV		Unit V	
	Amrahar (46*)		Biroulijham (32*)		Tikti (30*)		Akma (34*)		Nagipur (18*)	
	Range	Mean	Range	Mean	Range	Mean	Range	Mean	Range	Mean
Sand (%)	30.60-50.40	41.51	32.50-48.60	43.57	26.40-45.40	34.76	48.80-49.60	46.50	24.60-50.60	34.26
Silt (%)	22.00-44.00	33.78	30.00-49.00	35.89	32.00-47.00	38.57	32.00-39.00	35.11	25.00-49.00	37.53
Clay (%)	24.40-32.40	27.82	18.50-21.60	20.54	22.60-28.80	26.74	13.40-20.60	18.39	21.20-30.40	26.73
pH	8.66-10.39	9.51	8.23-10.20	9.36	7.10-9.50	8.98	7.80-9.78	8.95	7.13-9.90	8.58
EC (dSm^{-1})	0.13-1.15	0.43	0.26-1.68	0.75	0.03-0.66	0.19	0.10-0.80	0.35	0.16-0.70	0.33
Organic carbon g kg^{-1}	0.70-4.90	2.78,	0.60-4.70	2.97,	0.90-4.70	2.82,	0.60-4.80	3.03	0.80-5.10	4.06
Available Fe mg kg^{-1}	1.30-6.50	3.58	1.30-4.70	2.65	2.00-5.00	3.34	2.00-8.70	4.80	2.00-6.50	4.61
Available Mn mg kg^{-1}	1.00-5.00	3.33	2.00-6.00	2.94	2.00-5.00	3.03	1.00-6.00	3.26	2.00-6.00	3.61
Available Zn mg kg^{-1}	0.40-0.90	0.67	0.50-0.90	0.72	0.60-0.90	0.74	0.60-0.90	0.74	0.60- 0.90	0.76
Available Cu mg kg^{-1}	0.10 to 0.60	0.37	0.20-0.60	0.38	0.20-0.50,	0.37	0.20-0.60	0.45	0.20-0.60	0.44

*Figures in parenthesis indicate total number of soil samples

cupper category. The soils of farm unit I and III have little less content of available copper than farm unit II, IV and V. The available iron content ranged from 1.30 to 6.50, 1.30 to 4.70, 2.00 to 5.00, 2.00 to 8.70 and 2.00 to 6.50 mg per kg in farm unit I, II, III, IV and V, respectively. The soils of farm units I, II, and III of national seed project farm were low in available iron category, while the soils of farm units IV and V fell were under medium category.

Conclusion :

Soil reaction of all farm soils was saline to alkaline which is attributed to the presence of leaching of salts from the soil along with runoff and drainage water due to moderately low rainfall existing in the area, deposition of salts from the physiographic units. The organic carbon content in all the farms was low to medium due to low vegetative cover the soil erosion and warmer climate leading to low accumulation of organic carbon in the study area. Zinc, manganese and cupper were medium while iron were low in category in all national seed project farms.

REFERENCES

Bouyoucos, G.J. (1927). The hydrometer as a new and rapid method for determining the colloidal content of soils. *Soil Sci.,* **23** : 319-331.

Chopra, S.L. and Kanwar, J.S. (1976). *Analytical agricultural chemistry*, Kalyani Publishers, NEW DELHI, INDIA.

Kumar, M. and Babel, A.L. (2011). Available micronutrient status and their relationship with soil properties of Jhunjhunu tehsil, Jhunjhunu, Rajasthan, India. *J. Agril. Sci.,* **3** : 97-106.

Nayak, R.K., Sahu, G.C. and Nanda, S.S.K. (2002). Characterization and classification of the soils of Central Research Station, Bhubaneswar. *Agropedol.,* **12** : 1-8.

Roy, B.B. and Landey, R.T. (1962). Studies on red and lateritic soils of Mord watershed area of Raigarh district. *J. Indian Soc. Soil Sci.,* **32**(6) : 294-302.

Sivasankaran, K., Mithyantha, M.S., Natesan, S. and Subbarayappa, C.T. (1993). *Physico-chemical properties and nutrient management of red and lateritic soils under plantation crops in Southern India*. *NBSS Publ.,* **37** : 280.

Walia, C.S. and Rao, Y.S. (1996). Genesis, characteristics and taxonomic classification of some red soils in Bundelkhand region of Uttara Pradesh. *J. Indian Soc. Soil Sci.,* **44**(3) : 576-581.

Walkley, A. and Black, I.A. (1934). An examination of the Degtjareffmethod for determination soil organic matter and a proposed modification of the chromic acid titration method. *Soil Sci.*, **37** : 29-38.