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Assessment of Land/ Soil Properties of Different Research Farm of Baba Raghav Das P.G. College Deoria

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Abstract

This study was conducted on Assessment of Soil Quality of Properties of Different Research Farm of B.R.D. P.G. College, Deoria U.P. India. During 2018-2019. The Statically design of applied with RBD (Randomized Block Design) consisting of three different depth of soil analysis of physic-chemical properties of soil, i.e. of different depth 0-20, 20-30 and 30-40 cm respectively were found most significant finding were obtained from. The Baba Raghav Das P.G. College is Institute of Agriculture, Sciences a premier and foremost Agriculture Institute was established in the form of a School of Agriculture

Key words: Soil health, Research farm, physical and chemical properties

Introduction

The Quality of soil is depend upon environment quality field Agricultural sustainability depends to a large field upon maintenance or enhancement of soil health. Soil health is conceptualized as the major linkage between the strategies of conservation management practices & achievement of major goals of sustainable agriculture (Andrews, 2004). The quality & health of soils not only determine agricultural sustainability but also environmental quality & the plant, animal & human health. Thus the land care & soil quality management assume great significance for ensuring agricultural sustainability which is inevitable to feed the burgeoning population.

In eastern U.P. adverse effect of soil health arises from nutrient imbalance in soil, excesses fertilization, then is polluted and lost productivity therefore it cannot produce enough food to keep place with its needs, & therefore per capita food production is declining. Amongst the several factor of crop production, better soil quality is one of the most influencing sustainability.

Improper management of solid waste is one of the main causes of environmental pollution. Land pollution is one of the major forms of environmental catastrophe our world is facing today. As Bulgaria and the Slovak Republic, heavy metal industries have produced wastes that are deposited into landfills without special precautions (Lenkova & Vargova, 1994; Spassov, 1994). Cucu et al (1994) posit that approximately half of the population lives in the vicinity of waste sites that do not conform to contemporary standards in Romania. Czech Republicôs coal and uranium mines have produced serious pollution problems, and much of the solid industrial waste containing heavy metals is disposed of, without pretreatment, in open dumps (Rushbrook, 1994). Harvath & Hegedus (1994) concluded as the worst pollution of Hungary comes from open cast mines, lignite-based power plants, chemical factories, and the aluminum industry. The Silesia district in the south of Poland has severe contamination from mining and industry (Krzezlak & Korytkowski, 1994). Avdeev & Korchagin (1994) conceived soil pollution is critical issues in Ukraine. World Bank (2002) found Particulate matter is the most serious pollutant in large cities in South Asia.

Materials and Methods

This experiment was conducted during 2012-2014 on research farms of BRD PG College Deoria, Genetic and Plant Breeding, The right bank of the Kurna Nala and about 2 km. away from Deoria railway station. The soil was neutral in reaction, low in available N, medium in available p_2o_5 and high in available k_2o content. The experiment was soil survey, mapping and

analysis of physic-chemical properties of soil, of different depth 0-20, 20-30 and 30-40cm respectively. Physical properties- soil colour(In Dry and Wet condition), Soil Texture (sand, silt and Clay %), Pore Space(%), Particle Density (gcm^{-3}), Bulk Density (gcm^{-3}), Water holding capacity (%), Specific Gravity and Moisture (%). Chemical properties ï Soil pH (1:2 W/V), EC ($dS\ m^{-1}$), Organic Carbon (%), Organic Matter (%), Available Nitrogen ($kgha^{-1}$), Available Phosphorous ($kgha^{-1}$), Available Potassium ($kgha^{-1}$), Total Sulphur in Soil (ppm) and Total Zinc in soil (ppm). Micronutrients in Soil- Total Iron in Soil (ppm), Manganese in soil (ppm), and Total Cupper in Soil (ppm) .

Results and Discussion

The result obtained during the investigations carried out in the field and laboratory, are reported the department of soil Research Farm of different soil depth 0-20, 20-30 and 30-40 cm under the following headings (Table 1).

During the present investigation, soil sampling was taken from seven different research farm of department of B.R.D P.G. College Deoria, having an area of about 250 acre. These samples were analyzed for their various physic-chemical properties. The physical properties such as mechanical analysis, soil colour, soil texture, bulk density, particle density, pore space, soil moisture(%), has been determined by daily routine procedure as described by Saha (2004). The chemical characteristics viz. soil pH, electrical conductivity, total soil organic carbon, organic matter, total nitrogen, phosphorus, potassium, zinc, sulphur, and Iron has been determined by routine standard procedure (Black, 1965)

The Physical properties of different department of soil color (Dry method) of soil varied from light yellowish brown, olive yellow, pale olive, pale yellow, light olive brown, yellowish brown, dark brown, pale brown and dark yellowish brown. The soil color (Wet method) of soil varied from olive brown, olive, olive yellow, dark brown and dark yellowish brown, sand, silt and clay percentage varied from sand 50-65 %, silt 20-33 % and clay 15-20%. The textural class identified was sandy loam soil. The Pore Space (%) ranged from 50.00 to 69.00 percent and in each department soil pore space % decreases with the increasing soil depth. The highest pore space % was found in Horticulture department at 0-15 cm depth. Bulk Density was varied from 1.25 to 1.30 g cm^{-1}. The Particle Density varied from 2.25 to 2.87 g cm^{-1}, soil Moisture (%) ranged from 18.66 to 23.40 percent.

Table 1: The characteristics of the soil properties of B.R.D. P.G. College, Deoria

Soil Properties	0-20 cm(soil depth)	20-30 cm(soil depth)	30-40 cm(soil depth)
Soil Colour (Dry)	2.5 Y, 6/4 Light Yellowish Brown	2.5 Y, 6/6 olive Yellow	5 Y ,6/3 Pale olive
Soil colour (Wet)	2.5 Y, 4/4 olive Brown	2.5 Y, 4/4 olive Yellow	5 Y ,5/6 Olive
Soil Texture	Sand- 55%, silt- 30 %, clay- 15 % Sandy Loam	Sand- 58%, silt- 26 % , clay- 16 % Sandy Loam	Sand- 50%, silt- 33 % , clay- 17 % Sandy Loam
Soil pore Space (%) (PS)	57.00	53.00	52.50
Bulk Density g cm^{-3}(Bd)	1.30	1.30	1.25
Particle Density g cm^{-3} (Pd)	3.25	2.70	2.48
Moisture (%)	23.40	20.50	18.66
Specific Gravity(SG)	2.30	2.80	2.45
Water Holding Capacity (%)(WHC)	63.40	69.75	53.92
Soil pH 1:2 W/V	8.42	8.50	8.57
Soil CE ($dS\ m^{-1}$)	0.07	0.05	0.05
Organic Carbon (%)(O.C)	0.50	0.40	0.37
Organic Matter (%)(O.M)	0.90	0.70	0.40
Nitrogen (kg ha^{-1})	228.72	228.67	190.34
Phosphorus(kg ha^{-1})	17.82	17.34	15.82
Potassium (kg ha^{-1})	210	180	160
Total Sulphur (ppm)	17.86	16.40	15.32
Total Zinc (ppm)	0.90	0.84	0.70
Total Iron (ppm)	8.60	10.64	10.30
Manganese (ppm)	6.30	8.40	6.30
Total Cupper (ppm)	1.10	0.90	0.76

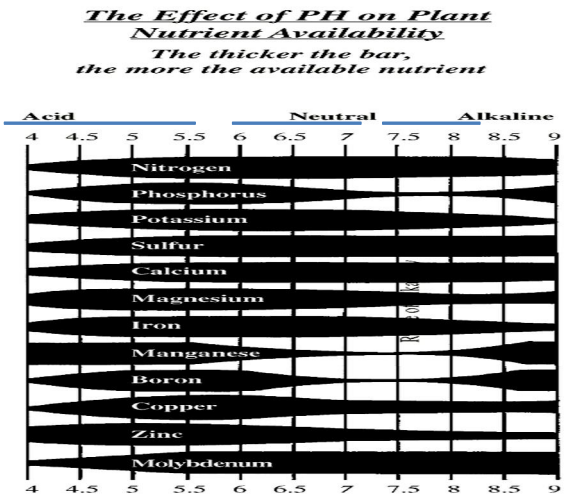

Fig 1: The effect of pH on plant nutrient Availability, The thicker the bar, the more the available Nutrients

Specific Gravity ranged from 2.30 to 2.80.The Water Holding Capacity (%) ranged from 53.92 to 69.75 percent. Department of Plant Protection holds the water best at 81.25 %. The pH value ranged from 8.42 to 8.51 pH. The alkalinity of Agro-forestry department is high at 8.51 pH. The Electrical Conductivity ranged from 0.05 to 0.07 dSm^{-1}. The soil is found to be non-saline. The value of Total Organic Carbon (%) varied from 0.37 to 0.50 %. Organic carbon content was found low in Plant protection and Agro-forestry but medium in the remaining department. The value of Total Organic Matter (%) varied from 0.40 to 1.90 %. Available Nitrogen content of soil ranged from 190.34 to 228.72 kg ha^{-1}. Nitrogen content is low in the entire department except in Agro-forestry it was found medium. Available Phosphorous content of soil ranged from 15.82 to 17.82 kg ha^{-1}. Phosphorous content was found low in the entire department. Available Potassium content of soil ranged from 98.00 to 254.39 $kgha^{-1}$. The value of Total Sulphur in soil varied from 14.76 to 20.17 ppm. The value of Total Zinc in soil varied from 0.76 to 1.36 ppm. The value of Total Iron in Soil varied from 6.30 to 12.50 ppm. The value of Total Manganese in Soil varied from 6.30 to 17.18 ppm. The value of Total Cupper in Soil varied from 0.76 to 1.20 ppm.

Soil pollution effects causes according to tutor vista (n.d) are cancer including leukemia and it is danger for young children as it can cause developmental damage to the brain furthermore it illustrated that mercury in soil increases the risk of neuromuscular blockage, causes headaches, kidney failure, depression of the central nervous system, eye irritation and skin rash, nausea and fatigue. Soil pollution closely associated to air and water pollution, so its numerous effects come out as similar as caused by water and air contamination. TNAU Agri. tech Portal soil pollution can alter metabolism of plantsômetabolism and reduce crop yields and same process with microorganisms and arthropods in a given soil environment; this may obliterate some layers of the key food chain, and thus have a negative effect on predator animal class. Small life forms may consume harmful chemicals which may then be passed up the food chain to larger animals; this may lead to increased mortality rates and even animal extinction.

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