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An analytical evaluation of soil characteristics of Moradabad district

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Abstract
The soil of the Moradabad campus is pale brown, silty loam, inseptisol with slightly alkaline to neutral in pH. The soil has been characterized as Type III (Agrawal and Mehrotra 1952). In general, the soil is alluvial and well drained. Details of soil Physico-chemical properties are described in Table 1. The soil was characterized by low levels of soil-C (0.73-0.90 %), N (0.02-0.10 %) and P (0.01-0.04%) with moderate soil bulk density (1.28-1.49 gm^{-3}) and water holding capacity (37-45 %). Thus, the study area is moderately fertile being low in soil-C, -N, and -P.

Keywords: Soil moisture, nutrients, industry, profile

Introduction
Moradabad is a city of Uttar Pradesh, India, famous for Brass Metal Handicrafts not only in India but also in abroad since ancient times. This city is situated in western U.P. between 28°-21´ to 28°-16´ Latitude North and 78°- 4´ to 79 Longitude East. Ram Ganga River flows in the north east and Gagan River is there in south west of the city. Being a river side land the soil composition of this area itself have a lot of impact [1, 2]. More than 58 per cent of Indian population depends on agriculture. Soil is the most vital natural resource of the country and it is the sole of infinite living organisms which supports the life of crop plants by acting as a medium for growth along with providing nutrients, air and water. Soil fertility plays a key role in increasing crop production in the soil. It comprises not only supply of nutrients but also their efficient management. Now-a-days fertility status of soil decreases day by day due to ever increase in human population, intensive cultivation, land degradation and desertification. Every inch of arable land has already been utilized to the maximum extent. The optimal management of these resources with minimum adverse effect on environment is essential [3-5].

Therefore, assessment of nutrient status of soils that are intensively cultivated needs to be carried out. Soil testing is usually followed by collecting the soil samples in the fields with geographic reference. Soil available nutrients status of an area using global positioning system (GPS) will help in formulating site specific balanced fertilizer recommendation to understand the status of soil fertility and also helpful for adopting a rational approach compared to farmers.

Material method
The soil samples were air-dried, ground (< 2 mm) and analyzed for chemical and fertility parameters. The pH (1:2.5) and electrical conductivity (EC) (1:2.5) of soils were measured using standard procedures as described by Jackson (1973). Organic carbon (OC) was determined using the WalkleyBlack method (1934). Available nitrogen (N) was estimated by modified alkaline permanganate method (Subbaiah and Asija, 1956). Available phosphorus (Olsen P) was measured using sodium bicarbonate ($NaHCO_3$) as an extractant (Jackson, 1973).

Observation and result
The soil has been collected as general to study the soil profile for the Moradabad district. For study the soil has been taken from 14 different spots and there mean were calculated for the prolific study.

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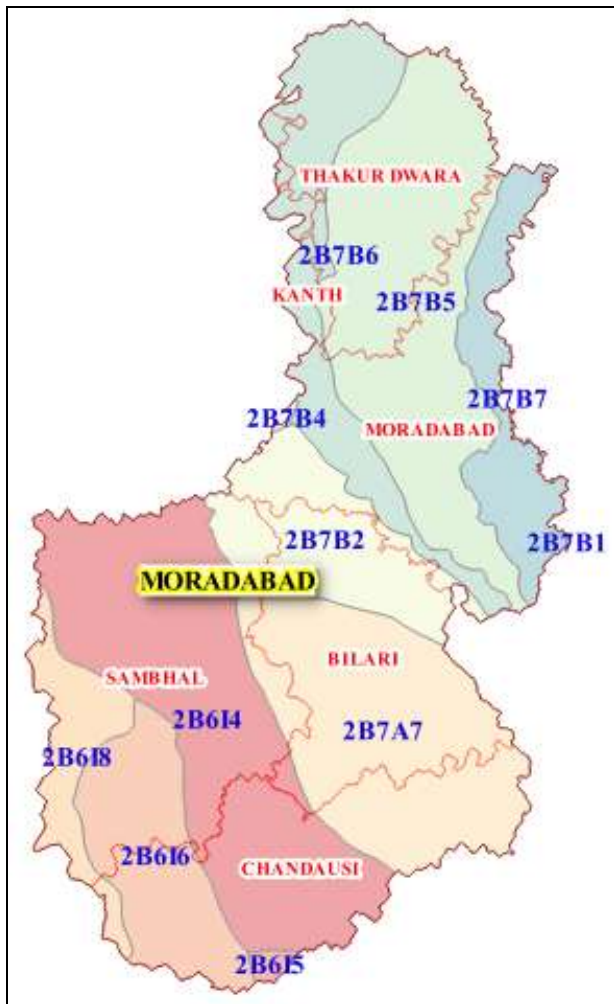Hindu College, Moradabad,
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Fig 1: Moradabad diatrict with different soil type.

Table 1: Physico-chemical properties of the soil of moradabad campus (Verma 2011). All the values are in percent except soil bulk density and soil pH.

Parameters	Mean	±SE	Minimum	Maximum
Sand	24.58	1.29	21.30	28.40
Silt	73.09	1.56	68.20	76.98
Clay	2.69	0.32	2.01	3.49
Moisture	9.01	1.79	3.96	14.04
WHC	41.60	1.33	37.00	45.00
Organic-C	0.81	0.03	0.73	0.90
Total-N	0.06	0.01	0.02	0.10
Total-P	0.03	0.01	0.01	0.04
Bulk density (gm-3)	1.40	0.04	1.28	1.49
pH	7.49	0.10	7.22	7.82

Conclusion

District Moradabad situated in western Uttar Pradesh region of India is famous for the manufacturing of brass handicrafts. Moradabad district occupies 3493 km2area and had the population of about 4.8 million according to census 2011 [6]. Majority of population utilizes groundwater for domestic, agriculture and industrial purposes. Some villages near the bank of Ramganga and Gangan river utilize river water for agricultural practices. Fast population growth, urbanization and industrialization have imposed pressure on the natural resources. The disposal of industrial effluent into the water bodies without adequate treatment is the major cause of the environmental pollution [8, 9]. Apart from the metal handicraft manufacturing industries, electronic waste recycling and metal waste recycling is being carried out on the banks of Ramganga River in Moradabad. The waste is being dumped into the ground and in the drains without any treatment. Considering the non-judicious disposal of wastes, the environmental monitoring of this region becomes very necessary.

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