

Physico chemical characteristics and status of available N, P and K in soils from Ahemedpur tahsil of Latur district

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ABSTRACT

Laboratory experiment was conducted to know the status of available N, P and K in relation to physico-chemical properties of soils from Ahemadpur tahsil of Latur district. For this, one hundred surface soil samples were collected from 20 villages (5 samples from each village). The analyzed samples showed that these soils were neutral to moderately alkaline in reaction, safe limit in EC, low to high in organic carbon and non calcareous to calcareous in nature. The results further indicated that soils were low to medium in available N and P while, available K was medium to high range. The available P showed significant negative correlation with soil pH while, EC had significant positive correlation with available K in soil.

Key words : Available N,P and K, Soil properties, Correlation and distribution.

The physico-chemical properties of soil are important for availability of nutrients in soil and thereby crop production. The supply of essential nutrients can be augmented by proper management of these properties, the N, P and K are important elements of the soil fertility. The nitrogen is the essential constitution of chlorophyll, protoplasm, protein and nucleic acid, phosphorus is the structural component of plant cell, required for early root development and growth. The potassium is important for increasing the disease resistant in plant and plays important catalytic role in activating enzymes, and improves quality of the produce. Intensive cropping with imbalance fertilizer and water use and lack of efficient management results in deficiency of these nutrients. Thus soil fertility management is lasting a challenge for sustainable development of agriculture. It was felt necessary to know the information on physico-chemical characteristics and nutrient status in soils. Therefore, the present investigation planned to know the status of available N,P and K in relation to physico-chemical properties of soils in Ahemadpur tahsils of Latur district in Maharashtra.

MATERIALS AND METHODS

One hundred surface soil samples were collected from 20 villages of Ahemadpur tahsil (five samples from each village) during the year 2006-07. The processed soil samples analyzed for pH, EC, organic carbon and calcium carbonate as per standard methods (Jackson, 1973). The available N was determined using alkaline permanganate method (Subbaih and Asija, 1956), available P was estimated using 0.5 M sodium bicarbonate as an extracting agent (Olsen *et al*, 1954) and available K was estimated

by extracting soil with neutral normal ammonium acetate with flame photometer (Jackson,1967). The correlation between physico-chemical properties and available N,P and K was worked out (Panse and Sukhatme, 1961).

RESULTS AND DISCUSSION

Physico-chemical properties of soils:

The data presented in Table 1 and Fig. 1 show that the lowest average value of pH (6.93) was recorded in soils from Kalegaon village and varied from 6.62 to 7.52. While, the highest value of soil pH (8.38) was observed in soils from Bodka. The soils under present study showed pH range from 6.56 to 8.60 indicating the neutral to moderately alkaline in reaction. These findings are in line with the results reported by Patil *et al*. (1987)

The lowest value of EC (0.19) was recorded in soils from Sonegaon that ranged from 0.18 to 0.22 dS m⁻¹. Whereas, the highest average value of EC (0.32) was observed in village Gadewadi and varied from 0.29 to 0.36 dS m⁻¹. Thus all the soil samples were in safe limit. The similar range of EC was recorded in soils of Bihar (Bhokal *et al*, 1993).

In general the organic carbon content in these soils ranged between 0.21 to 1.28 per cent (Table 1). The lowest Organic carbon content was noted in village Umarga-kor ranged from 0.25 to 0.58 per cent with a mean value of 0.42 per cent. While, the highest average value of organic carbon content (0.94) was observed in village Hippalgaon, varied from 0.78 to 1.07 per cent. Similar content of organic carbon was reported in soils of Jayakwadi command area in Marathwada (Bharambe and Ghonshikar, 1985). These results are also in accordance with the findings reported by Malewar (1995).