Research Article

# Health Status of Soil Collected Near Road Sides of Railway Junction, its Residential Area, Salem, Tamilnadu, India

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**ABSTRACT**

The soil health is a measure of degree of fitness of soil for specific use. Since, soil is able to retain, disperse, transform materials it acts as an environmental filter or buffer. The present study was done to evaluate the nutrients available in soil samples collected near road sides of railway junction-location 1 and near road sides of its residential area- location 2. The nutrients tested showed variations in both the sites. The humus content was high (104.32Kg/acre) for location 1 whereas it was very low (57.51Kg/acre) for location 2, thereby emphasizing the care and attention. But, the total mineral content was high (246.99Kg/acre) with location 2 when compared to location 1 having only (239.87Kg/acre). In between variation was observed in most of the nutrients assessed.

**Keywords:** Humus, Nutrients, Organic carbon, pH, Soil, Nutrients.

## INTRODUCTION

The availability of nutrients in a particular plant grown in a particular location is a result of balance between nutrient uptake, plant growth and retranslocation of nutrients and other environmental nutrients.[1] Several elements take part in the growth and development of plants, and those absorbed from the soil are generally known as plant nutrients. Besides these, the plant takes up carbon, oxygen and hydrogen, either from the air or from the water absorbed by roots. Hence, this study was planned to evaluate the nutrient content of the soil samples collected near roadsides of railway junction and also near road sides of its residential area. This study gives the impact of pollution accumulated over a long period of time with soil nutrients.

## MATERIALS AND METHODS

The collected samples were cleaned and sieved to remove the debris. 500gm of the sieved sample was packed in a new air tight plastic cover and sent for soil nutrient analysis. The soil samples collected from location 1 represents soil samples collected near roadsides of railway junction. Likewise, samples collected at location 2 represents soil samples collected near road sides of its residential area. The physio-chemical properties of soil were determined by following an alternative analytical indigenous technology developed by MCRC, IIT(M), Taramani, Chennai.

## RESULTS AND DISCUSSIONS

### Location 1

The pH of the soil sampled analysed was found to be 7.60. The electrolyte conductance was 0.15. The organic carbon content was 1.56%. The nitrogen content was 105.95kg/acre. The phosphorus content was 13.08kg/acre. The potassium content was 120.85kg/acre. The calcium content was 485.43mg/kg. The magnesium content was 158.88mg/kg. The sodium content was 141.66mg/kg. The iron content was 6.37mg/kg. The manganese content was of 3.87mg/kg. Copper content was 1.29mg/kg. The zinc content was 0.49mg/kg. The boron content was 0.49mg/kg. The sulfate content was 18.47mg/kg. The humus content was 104.32mg/kg. Total mineral content was 239.87mg/kg. (Table.1)

Alkaline pH was observed in the soil sample collected near roadsides of railway junction. The nitrogen, phosphorus content was found to be low in site 1 on comparison with normal. (Table.2)

**Table 1:** Showing results of soil samples collected near road side of railway junction (Location 1) and its residential area (Location 2)

| Nutrients | Location 1 | Location 2 |
|---|---|---|
| pH | 7.60 | 7.10 |
| EC | 0.15 | 0.64 |
| Organic Carbon (%) | 1.56 | 1.50 |
| Nitrogen (Kg/acre) | 105.95 | 114.49 |
| Phosphorus (Kg/acre) | 13.08 | 15.32 |
| Potassium (Kg/acre) | 120.85 | 117.18 |
| Calcium (mg/kg) | 485.43 | 456.19 |
| Magnesium (mg/kg) | 158.88 | 182.32 |
| Sodium (mg/kg) | 141.66 | 127.59 |
| Iron (mg/kg) | 6.37 | 10.86 |
| Manganese (mg/kg) | 3.87 | 5.33 |
| Copper (mg/kg) | 1.29 | 1.74 |
| Zinc (mg/kg) | 0.49 | 0.57 |
| Boron (mg/kg) | 0.49 | 0.53 |
| Sulfate (mg/kg) | 18.47 | 20.77 |
| Humas (Kg/acre) | 104.32 | 57.51 |
| Total minerals (Kg/acre) | 239.87 | 246.99 |

**Table 2:** Showing Normal Nutrient Values

| Nutrient | Low | Medium | High |
|---|---|---|---|
| N (Kg/acre) | <113 | 113-182 | >182 |
| P (Kg/acre) | <18 | 18-36 | >36 |
| K (Kg/acre) | <60 | 60-138 | >138 |
| OC (%) | <0.75 | 0.75-1.5 | >1.5 |
| Mg (mg/kg) | <10 | 10-15 | >15 |
| HA (Kg/Acre) | <18 | 18-31 | >31 |
| Iron (mg/kg) | <6 | 6-8 | >8 |
| Mn (mg/kg) | <1 | 1.2-2.5 | >2.5 |
| Cu (mg/kg) | <0.3 | 0.3-1 | >1 |
| Zn (mg/kg) | <0.5 | 0.5-1 | >1 |
| Sulphur (mg/kg) | 0-10 | 10-15 | >15 |
| Ca (mg/kg) | <300 (Deficient) | >300(Sufficient) | - |
| Boron (mg/kg) | <0.5(Deficient) | >0.5(Sufficient) | - |
| Molybdenum (mg/kg) | <0.2(Deficient) | >0.2(Sufficient) | - |

While the potassium, iron content was medium with this soil sample. The calcium, magnesium, manganese, copper, sulphate, humus content was high in the studied sample. The boron was deficient in this soil. On the whole, the total minerals present were 239.87mg/kg. (Table.1)

**Location 2**

The pH of the soil analysed was found to be 7.10. The electrolyte conductance was 0.64. The organic carbon content was 1.50%. The nitrogen content was 114.49kg/acre. The phosphorus content was 15.32 kg/acre. The potassium content was 117.18kg/acre. The calcium content was 456.19mg/kg. The magnesium content was 182.32mg/kg. The sodium content was 127.59mg/kg. The iron content was 10.86mg/kg. The manganese content was of 5.33mg/kg. Copper content was 1.74mg/kg. The zinc content was 0.57mg/kg. The boron content was 0.53mg/kg. The sulfate content was 20.77mg/kg. The humus content was 57.51mg/kg. Total mineral content was 246.99mg/kg. (Table 1)

Organic carbon, magnesium, iron, manganese, copper, sulphate content was high when compared to normal. (Table.2) The nitrogen, potassium, calcium, zinc content was medium with the studied soil sample, whereas low phosphorus content was observed. Sufficient amount of boron was seen in the soil. The humus content was low when compared to site 1 but it was within normal range when compared to normal. (Table. 2) Total mineral content observed was higher than site 1.

Organic carbon, nitrogen contents in soil are a result of a complex biochemical interaction between substrate additions of C, N in fertilizers and in plant, animal residues, and also losses of C, N through microbial decomposition, mineralization as well as erosion. Changes in inputs, such as fertilizers, residues,[2, 3, 4] which regulate soil microbial activity and mineralization rates, will finally be reflected in the total organic carbon, nitrogen content of soil.

## CONCLUSION

The soil not only comprises of minerals, organic matter, water and air but the product of their interactions. Plants obtain nutrients and water from soil. Hence, it is essential to study the nutrient status of soil for the healthy growth of the plants. Among the major nutrients NPK studied, the nitrogen, phosphorus content was low in both the location studied. Potassium was found to be medium in both the locations. Total mineral content was high with location 2 while it was low in location1 when compared to location 2. The major and minor nutrients can be improves in the soil if applied with fertilizers. It is essential to stabilize ecosystem and also in enhancing water and air quality.

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