

# ANALYSIS OF SOIL SAMPLES FOR ITS PHYSICO CHEMICAL PROPERTIES FROM JAWALA VILLAGE, OF ARNI TAHASIL, DIST YAVATMAL

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**Abstract :** The present study objectively conducted to analysis the physico-chemical properties of soil sample of Jawala village. The study area was divided into five sampling stations to cover the whole farms of Jawala village Arni tehsil comprehensively in the November 2019. The physico-chemical parameters were observed Moisture, pH, EC, Carbon, Calcium carbonate, TDS, Magnesium, Calcium, Nitrogen, Copper, Potassium and Phosphorous content, were analyzed during the study.

The study revealed that the pH of the soil samples ranged from 7.08 to 8.50 and was on slightly alkaline side but within the limit of 6.5-8.5 which is optimum for crops. EC values ranged from 0.4ms to 0.8ms. and indicating low salinity status of the soils. OC content ranged from 1.27% to 1.60% and all the samples were of medium rating. Available nitrogen ranged from 247 kg/ha to 297kg/ha; available phosphorous ranged from 19.0kg/ha to 25.0 kg/ha and samples were nitrogen and phosphorous deficient. Potassium ranged from 442 kg/ha to 640 kg/ha and samples were of medium rating except one sample of high rating with respect to potassium.

**Key words:** Physico-chemical parameters, Jawala village, Soil quality.

## I. INTRODUCTION

Soil analysis is well recognized as a sound scientific tool to assess the status of available micronutrients in soils and their relationship with various physico-chemical properties. Considerable research work has been done regarding the study of Nutrients and Physico-Chemical assessment of various types of soil in Maharashtra as well as in India have been attempted by several investigators. Kumar M. (2011) Nazif, et.al.(2016), Methur R. et.al.(2011) reported soil analysis and its environmental impact on Nanded city of Maharashtra State. Khadke P.A.et.al.(2013), The status of micronutrients in soils district Bhimber and their relationship with various physico-chemical properties were investigated by Wajahat Nazif, et.al.(2006).

Soil fertility and productivity are the key pillars for food production and soil quality is of equal significance in the background of soil degradation caused by many factors. Crop growth is influenced by aerial and soil environment. Suitable environment is necessary for better germination, growth and yield of crops.

The higher nutrient availability is favorable when soil has higher water holding capacity, proper aeration and less soil strength or mechanical resistance. The six elements nitrogen, phosphorous, potassium, magnesium, calcium and sulphur which are required in large quantities are labeled as macronutrients. Most of the soils supply enough calcium, magnesium and sulphur and soil scientists called these elements as secondary nutrient elements. The other three elements nitrogen, phosphorous and potassium are called as primary nutrients and are not usually available in large amounts which is enough for best growth and therefore are added through fertilization. Considerable research work has been done regarding the study of Nutrients and Physico-Chemical assessment of various types of soil in Maharashtra as well as in India. A.A.Patil et.al.(2013), R.P.Ganorkar et.al.(2013), R.P.Ganorkar et.al.(2014), Keeping these points in view, investigation was carried out to analysis of status of soil samples of Jawala village in Arni Tahsil of Yavatmal district in Maharashtra, India.

## II. MATERIAL AND METHODS

### Study Area

Jawala is a village in Arni Tahsil in Yavatmal District of Maharashtra State, India; which is shown in Fig.-1. It belongs to Vidarbha region Yavatmal Division, This area is well known for cotton and soyabean. The sources of water for this area is of well and tube well.

### Sample Collection

Five samples were collected from the study area (farmers field) in the month of November 2019. Soil samples were collected randomly at 0 to 15 cm and 15 to 30 cm depths with five plots, five samples from each plot respectively, in well sterilized polythene pouches. Soil sample were collected from following Farmers fields-

1. Sample-1 was collected from Mr. Prakashrao Dhakulkar's field.
2. Sample-2 was collected from Mr. Ullas Prakash Jadhav's field.
3. Sample-3 was collected from Mr. Chandrakant Gabhane's field.
4. Sample-4 was collected from Mr. Sanjay Gaddamwar's field.
5. Sample-5 was collected from Mr. Tarachand Jadhao's field.

### Physicochemical Analysis of Soil Samples

The soil sample were dried for about 24 hrs. and grinded more finely. Methods use for estimation of various parameters is as follows, like Determination of Moisture was by Weighting Method, pH by Digital pH Meter, EC by Conductometer, OC, Ca, N,P,CaCO<sub>3</sub> by Titration Method, Determination of Mg was done by EDTA Titration Method. Determination of TDS estimated by TDS meter, Determination of Potassium (K) by Flame Photometry. Determination of Colour Of Soil, by Viewing soil.

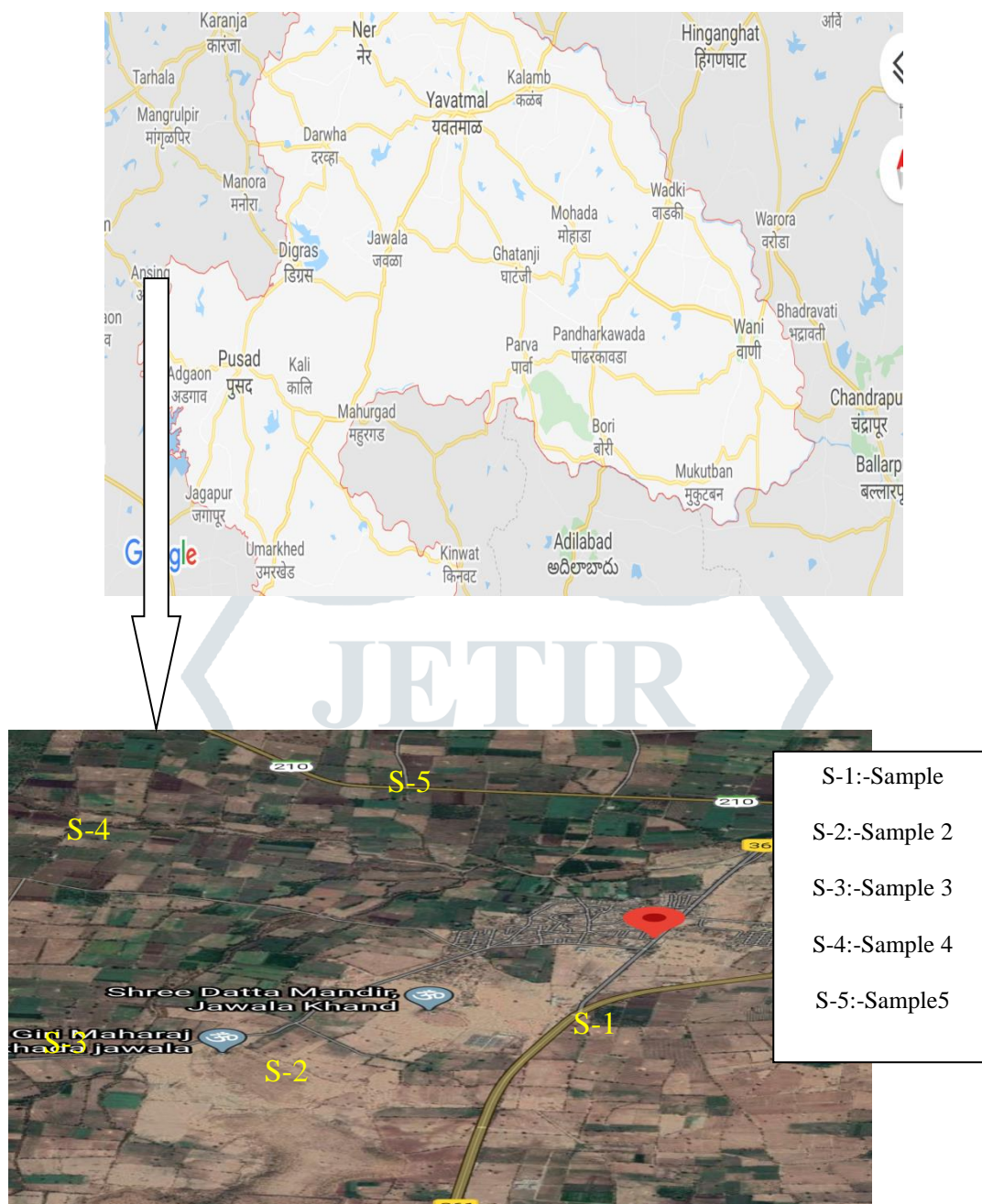


Figure1:-Map of Study area Jawala,Arni Tehasil

### III. RESULT AND DISCUSSION

#### Colour of Soil

The soil sample S1 are Brown, sample S3 are Reddish Brown and S2,S4,S5, was Faint Black in colour.

#### TDS

The percentage of TDS in soil samples ranges from 115-220. It was observed in sequence  $S3 < S4 < S1 < S5 < S2$ .

#### Moisture

Value of moisture content ranges from 1.6% - 10 %. The result shows that the moisture of sample S1 is less as compared to other samples.

#### pH

The range of pH is found in between 7.80 – 8.50. The sample S4,S5 is slightly alkaline sample as compared to S1,S2,S3 soil sample which is medium alkaline.

#### Organic Carbon

Organic carbon was recorded in the range of 1.27 – 1.60 %. The soil sample S1,S4 has high percentage of organic carbon sample S2,S5 have moderate and sample S3 has less organic carbon.

#### Nitrogen

Nitrogen content in the soil ranged from 247- 297 kg/hect. The sample S5 has high nitrogen content as compared to other sample.

#### Phosphorous

Phosphorous content in the soil sample ranged between 19.0- 25.0 kg/hect. The soil sample S3,S5 has more phosphorous content as compared to sample S1,S2 and S4.

**Potassium**

Potassium content in the soil sample ranged between 442 – 640 kg/hectar. The soil sample S2 and S5 have more potassium content as compared to sample S3, S1 & S4.

**Magnesium**

The Magnesium content in the soil sample ranged from 0.840 – 0.893 %. It is seen in sequence  $S1 < S2 < S3 < S5 < S4$ .

**Electric Conductance**

The Electric Conductance values varies from 0.4 – 0.8 ms. It is seen that soil sample S3 have less amount of Electric Conductance as compared to sample S1, S2, S4, S5.

**Calcium**

The Calcium content in soil sample ranges from 0.08 - 0.18 %. The soil sample S4, S5 has high percentage of calcium, sample S3 have moderate and samples S1, S2 has less calcium content.

**Alkalinity**

The Alkalinity was observed in the range between 533.5–1164 mg/lit. and it is in the range  $S5 > S4 > S2 > S1 > S3$ .

**Calcium Carbonate**

The Calcium Carbonate content in soil samples ranges from 5.25-7.25 %. It is seen that soil sample S1, S4 have less amount of Calcium Carbonate as compared to soil samples S2, S3 and S5.

**IV. CONCLUSION**

The physico chemical analysis of soil provides necessary information to set the target of nutrient application. The soil samples are slightly alkaline and the pH is in  $S3 < S2 < S1 < S5 < S4$  order hence the Suggestion the use of compost manure, In the soil sample S1 and S2 the magnesium is less. In the soil sample S2 and S4 phosphorous is less as compare to other sample. In the soil sample S1, S4 and S5 the organic carbon is approximate high and nitrogen is approximate high.

Table 1 : Physico chemicals parameters of soil samples.

S. No.	Parameters	S1	S2	S3	S4	S5
1	Colour	Brown	Faint Black	Reddish Brown	Faint Black	Faint Black
2	TDS (mg/L)	168	220	115	162	197
3	Moisture (%)	1.6	7	10	2.6	2.6
4	pH.	7.90	7.80	8.20	8.50	8.40
5	Organic Carbon (%)	1.60	1.44	1.27	1.60	1.55
6	Nitrogen (kg/hect)	271	247	250	256	297
7	Phosphorous(kg/hect)	21.5	19.0	25	20.0	22.5
8	Potassium (kg/hect)	496	640	442	512	540
9	Magnesium (%)	0.840	0.855	0.873	0.893	0.864
10	Electro Conductance(ms)	0.5	0.8	0.4	0.6	0.7
11	Calcium (%)	0.08	0.08	0.10	0.18	0.12
12	Alkalinity(mg/L)	727.5	824.5	533.5	1018.5	1164
13	CaCO <sub>3</sub> (%)	5.25	7.25	5.60	5.25	7.25

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