

pH of soil of Majalgaon command area (Jayakwadi project stage-III), India

S. G. Kadam¹, B. J. Ugle², G. M. Rathod², D. M. Pathan² and P. R. Bhambe³

¹Department of Voc., Shrikrishna Jr. College, Gunjoti, Tq. Omerga, Dist. Osmanabad (M.S.), India.

²Department of Botany and Zoology, Shrikrishna College, Gunjoti, Tq. Omerga, Dist. Osmanabad (M.S.), India.

³Department of Soil and Management, Marathwada Agricultural University, Parbhani (M.S.), India.

Abstract

Present paper deals with the study of pH of soil of Majalgaon command area, India. pH varied from 7.55 to 8.98 in different soil types and showed increased trend with depth in most of the profiles.

Keywords: Soil, Majalgaon, pH, chemical properties.

INTRODUCTION

Soils vary in their chemical properties. Characterization of soils is based upon their properties. In the new strategy of agriculture great emphasis is being laid on fertilization and canal irrigation for increasing agricultural production. Marathwada is endowed with black cotton soils and assured rainfall in some areas but the crop production per unit area remained considerably low. Though irrigation is major input in scientific agriculture which originally help to harvest bumper crops may prove harmful if used unjudiciously for long term, particularly in black cotton soils (Vertisols).

Maharashtra Government has initiated number of irrigation projects in Marathwada. Out of these Jayakwadi project occupies largest area and cover about 2.76 lakh hectares area and besides this Majalgaon canal command which forms a Jayakwadi project stage-III covers 94,000 hectares area which include mostly the black cotton soils of varying depth. The operation of irrigation projects on such heavy black soils needs evaluation of soils properties relevant to irritability.

Knowledge of physio-chemical properties of these soils is essential to understand the physical and biological processes going on in the soils. Proper soil water management for optimum crop production require a thorough knowledge of the moisture retention characteristics of soils profile which provides information on ability of the soils to store water and its subsequent availability for plant growth.

The diagnosis of plant nutrients deficiencies by resting the soil is basically important to make efficient use of fertilizers. Insufficiency of an available nutrient element in the soil reduces effectiveness of other element and consequently lower yields. Soil reaction play important role in the availability of nutrients. In heavy soils, especially under alkaline condition, the nutrients are usually changed to such chemical forms that they are not easily available to plant. With the knowledge of soil reaction and electrical conductivity we can get an

idea to reclaim salt affected soils. Shaikh (1979) [1] and Maniyar (1979) [2] tried to classify the soils of Purna command area which have developed salinity and sodicity due to long term irrigation.

Bharambe and Ghonsikar (1985) [3] and Bharambe et al. (1990) [4] studied the physico-chemical properties of Jayakwadi project stage I and II. However, the data available on physico-chemical characteristics of soils under Majalgaon canal command (Jayakwadi project stage III) is very merge and insufficient to characterize the physical nature and overall fertility status of whole command area which is being brought very recently under irrigation.

Therefore, keeping this in view the present investigation was under taken with object to study the chemical reaction of soils profile wise under Majalgaon canal command. The finding of this study is expected to serve as a guideline for the decision makers and to improve farm yields in the command area. It is hoped that this data will also serve as a good bench mark for indicating the changes brought about by perennial irrigation with canal water in soil properties in later period.

MATERIALS AND METHODS

Seven profile samples were collected from different location. The sample was collected from 0-15, 30-60, 60-90 and 90-120 cm depth according to soil types. The details of profile locations and soil types are in table 1. During the study of soil analysis the chemical property i. e, soil reaction was determined in 1:2 soil suspension, using Beckman pH meter with glass electrode.

Table 1. soil type and soil colour from different villages

| Profile No. | Location | Soil type | Soil colour |
|-------------|---------------|-----------------------|-------------------------|
| 1 | Pimpalgaon | Deep Vertisols | Very dark grayish brown |
| 2 | Pawarwadi | Deep Vertisols | Very dark grayish brown |
| 3 | Anandgaon | Medium deep Vertisols | Dark grayish brown |
| 4 | Pohner | Deep Vertisols | Very dark grayish brown |
| 5 | Simri paragon | Medium deep Vertisols | Dark grayish brown |
| 6 | Pimpri | Shallow Black soils | Dark grayish brown |
| 7 | Takali | Medium deep Vertisols | Dark grayish brown |

Received: April 10, 2012; Revised: May 17, 2012; Accepted: June 25, 2012.

*Corresponding Author

S. G. Kadam

Department of Voc., Shrikrishna Jr. College, Gunjoti, Tq. Omerga, Dist. Osmanabad (M.S.), India.

Email: sgkadam@gmail.com

RESULTS AND DISSCUSION

Soil reaction (pH) has direct bearing on availability of nutrients and activity of microorganisms. Data presented in table 2 indicated that the pH of all the soil profile under study showed neutral to alkaline range which varied from 8.00 to 8.48 in deep Vertisols. 8.02 to 8.40 in medium deep Vertisols and 8.21 in shallow black soil in

surface layers and it followed increasing trend with depth. Comparatively higher values of pH of these soils may be described to the high content of free calcium carbonate (table). Gajbe et al., (1976) [5] while reviewing soils of Marathwada reported that the present material was of basaltic organic which is inherently rich in basic cations. More et al. (1988) [6] reported that pH of saline soil was 8.1 and increased gradually down the profile to 10.7.

Table 2. pH of soil from different villages

| Sr. No. | Village | Depth (cm) | pH |
|---------|--------------------------------------|------------|------|
| 1 | Pimpalgaon- Deep vertisols | 00-15 | 8.00 |
| | | 15-30 | 8.00 |
| | | 30-60 | 8.02 |
| | | 60-90 | 8.16 |
| | | 90-120 | 8.33 |
| 2 | Pawarwadi- Deep vertisols | 00-15 | 8.07 |
| | | 15-30 | 8.03 |
| | | 30-60 | 8.03 |
| | | 60-90 | 8.15 |
| | | 90-120 | 8.36 |
| 3 | Anandgaon- Medium deep vertisols | 00-15 | 8.34 |
| | | 15-30 | 8.29 |
| | | 30-60 | 8.30 |
| | | 60-90 | 8.19 |
| | | 90-120 | 8.19 |
| 4 | Pohner- deep Vertisols | 00-15 | 8.48 |
| | | 15-30 | 8.60 |
| | | 30-60 | 8.61 |
| | | 60-90 | 8.93 |
| | | 90-120 | 8.69 |
| 5 | Simri pargaon- medium deep Vertisols | 00-15 | 8.40 |
| | | 15-30 | 8.35 |
| | | 30-60 | 8.69 |
| | | 60-90 | -- |
| | | 90-120 | 8.75 |
| 6 | Pimpri- shallow black soil | 00-15 | 8.21 |
| | | 15-30 | 7.55 |
| | | 30-60 | -- |
| | | 60-90 | -- |
| | | 90-120 | -- |
| 7 | Takali- medium deep Vertisols | 00-15 | 8.02 |
| | | 15-30 | 8.20 |
| | | 30-60 | 8.50 |
| | | 60-90 | 8.46 |
| | | 90-120 | -- |

In the new strategy of agriculture great emphasis is being laid on intensive cropping with adequate fertilization and use of Canal irrigation for increasing agricultural production, particularly, in command area. Therefore a knowledge of soil reaction (pH) of soils of command area is essential to characterize these soils for their fertility status and base exchange characteristics with this object in view, seven soil profiles were exposed and soil samples were collected from various localities in Majalgaon right bank canal command area. These soils were grouped into three classes on the basis of depth such as deep, medium and shallow and analyzed for soil reaction (pH). The data emerged out from this study are summarized below. Soil reactions varied from 7.55 to 8.98 in different soil types and showed increased trend with depth in most of the profiles. The analysis table-II shows that Pimpalgaon soil was deep vertisols and pH ranges 8.00 to 8.33, Pawarwadi soil was deep vertisols and pH ranges 8.03 to 8.16, Anandgaon soil was medium deep vertisols and pH ranges 8.19 to 8.34, Pohner soil was deep vertisols and pH ranges 8.48 to 8.93, Simri pargon soil was medium deep vertisols and pH ranges 8.35 to 8.75, Pimpri soil was shallow

black vertisols and pH ranges from 7.55 to 8.21 while Takali soil was medium deep vertisols and pH ranges from 8.02 to 8.50.

AKNOWLEDGEMENT

First author is very thankful to Principal and Director of Shrikrishna Education Society, Gunjoti for giving research facilities.

REFERENCES

[1] Shaikh, H. S. 1978. Distribution and availabilities of NPK and Ferrous in and salt affected soils of Parbhani district. M.SC. Agri. Thesis M.A. Uni. Parbhani (M.S.).
 [2] Maniyar, V. G. 1979. Physico chemical and mineralogical characteristics of normal and salt affected soils of Parbhani districts. M.SC. Agri. Thesis M.A. Uni. Parbhani.
 [3] Bharambe, P. R. and Ghonsikar, C.P. 1985. Physico-chemical characteristics of soils in Jayakwadi command. *J.M. A. U.*

10(3): 247-249.

[4] Bharambe, P. R., Awasarmal, B. C., Ambegaonkar, P. R. and Rodage, R. P. 1990. Characterization of soils in relation to irrigation in Jayakwadi command area. *J. Indian soil Science*. 38: 488-494.

[5] Gajbe, M. V., Lande, M. G. and Varade, S. B. 1976. Soils of

Marathwada. *M. A. V.* 1 (26) 55-90.

[6] More, S.D., Shinde, T. S. and Malewar, G. V. 1988. Characterization of some salt affected soils of Purna command area of Maharashtra. *Journal of Indian Society of soil Science* 36: 146-180.