

Studies on water quality analysis

S.B. JADHAV, U.M. KHODKE, R.G. BHAGYAWANT AND D.V. RAUT

Accepted : January, 2009

ABSTRACT

An experiment was conducted in College of Agricultural Engineering and Technology, M.A.U. Parbhani to determine physico-chemical properties of water such as electrical conductivity, pH, dissolved oxygen TDS (Total dissolved solids), SAR (sodium absorption ratio), cations, anions etc. Water samples of 20 open/bore wells located in M.A.U. campus were selected for the study. A micro controller based instrument (water analyzer) equipped with user-friendly software and various titrating agents were used to determine physico-chemical properties of water samples. The pH of well water samples before monsoon ranged from 7.92 to 9.72 and after monsoon ranged from 7.32 to 9.01. The average per cent reduction of 7.25 % in pH values was observed in post monsoon season. The average per cent reduction of 18.62 % in electrical conductivity value was observed in post monsoon season. Based on EC (Electrical Conductivity) and SAR values, the water samples were grouped under pre monsoon and post monsoon season and accordingly, suitability of irrigation water was suggested. Calcium (Ca^{++}), Magnesium (Mg^{++}) concentration in groundwater was within the low range before and after monsoon. Dissolved oxygen, Total dissolved solids, sodium absorption ratio (SAR), RSC and chloride content values before and after monsoon showed that the water samples collected are of good quality and can be safely used through drip irrigation system. All the collected water samples need chemical treatment before being used through drip irrigation as the values in respect of pH, EC, CO_3^- , HCO_3^- were found to be on higher side.

See end of the article for authors' affiliations

Correspondence to:

D.V. RAUT

Department of Irrigation and Drainage Engineering
College of Agricultural Engineering and Technology,
Marathwada Agricultural University, Parbhani (M.S.)
INDIA

Key words : Water analyzer, SAR

Several classification of irrigation water has been proposed in India and abroad, on the basis of their chemical characteristics and their effect on crop growth. Amongst these, the classification proposed by the USDA is widely used because it includes both factors of none and sodium hazards. Use of unsuitable irrigation water not only results in soil and crop deterioration but it also damage the irrigation system. Under such situations, knowledge of the quality of water is essential for judging its suitability for irrigation purpose and contribution to plant irrigation supply and in order to generate information related to seasonal groundwater quality in Marathwada Agricultural University campus, the present investigations has been planned to determine physico-chemical properties (pH, EC, D.O., cations, anions etc.) of groundwater, to compare these parameters with the permissible limits of irrigation water and suggest its suitability for irrigation purpose.

METHODOLOGY

Experimental site:

The experiment was conducted in the laboratory of Department Of Irrigation and Drainage Engineering, College Of Agricultural Engineering and Technology, Marathwada Agricultural University, Parbhani.

Water analyser was used to measure pH, Dissolved oxygen (D.O.), Water samples of 20 open/bore wells located in M.A.U. campus were selected for the study. A micro controller based instrument (water analyser) equipped with user-friendly software and various titrating agents were used to determine physico-chemical properties of water samples.

Collection of water samples:

To determine the water quality, one litre clean bottle with a leak proof cap was used. The bottle was thoroughly cleaned before sampling.

Analysis of water:

pH, D.O., EC, TDS, Turbidity of all 20 samples were measured with the help of water analyser.

Calcium and Magnesium:

Calcium and magnesium were determined by Versenate Method by using EDTA as titrating agent (Chopra and Kanwar, 1980).

Sodium and Potassium:

Sodium and potassium were determined by flame photometrically (Chopra and Kanwar, 1980).