



## Irrigation Water Sampling

Thulani (Vincent) Zuma

### Introduction

The quality of irrigation water is important in agriculture. General properties that apply to water quality include: adequate amounts of dissolved oxygen, comparatively low organic matter, neutral pH, free of excessive amounts of infectious agents, toxic chemicals and minerals (Oluyemi *et al.*, 2010). For irrigation water, the major concern is usually salinity which affects both soil structure and crop yield. However, water can also have trace elements and other chemicals that make it unsuitable for irrigation. It is, therefore, important to monitor the quality of irrigation water on a continuous basis. Apart from salinity and trace elements, other factors that are used to determine water quality include: pH, total alkalinity, chlorides, sodium adsorption ratio (SAR), electrical conductivity (EC) and total dissolved solutes (TDS).

### Water Sampling

In order for the laboratory to provide an accurate water analysis, the sample being tested has to be sampled correctly. If the sample submitted to the laboratory was not sampled properly, or if it contains contamination, results and therefore interpretation will be wrong. It is therefore essential to ensure that a representative sample is taken, and that it is free of contamination.

### Sample containers

Use 500 ml to 1 litre containers. Plastic bottles are preferred. Clean the containers and stoppers thoroughly. Fill the container to half-mark with the water you wish to sample, and close with the cap.

Shake vigorously to remove any contamination and empty it. Repeat this step three times. Any contamination in the container will affect analytical results.

### Water sources:

**From a tap:** Open the tap fully and allow water to flow for about 2 minutes before taking the sample. Fill the sample container to the top and close with cap to make a tight seal. To prevent aeration of the sample, turn the tap to half open while taking the sample.

**From borehole or well:** If samples are being taken from a borehole or well it is preferable to take them from a pump outlet pipe through which water has been pumping continuously for at least 24 hours. The sample can then be taken as described for tap water.

**From stream, lake or fountain:** Remove the stopper from the container and immerse it completely in the water, holding it at the base. For running water, hold the container upstream while filling. For standing water, fill the container while moving it slowly forward. Do not disturb any sediment or collect it with the water. If walking in the water cannot be avoided, the sampler must keep walking upstream while sampling. Suitable and thoroughly cleaned containers can also be attached to a rod or suitable extension, to collect samples as explained above and later transferred to the sampling bottle if it has a narrow opening.

Once sampling is complete, wipe the container dry on the outside and label immediately. Do not wait for samples to pile up before labelling. This will result in

samples being mixed up. Information such as sample name, date, time and person sampling can be useful in identifying samples. A permanent marker must be used for labelling samples.

### **Sending samples to the Laboratory**

If samples cannot be sent to laboratory immediately, they must be kept in a refrigerator. Samples can be submitted directly to the laboratory (see address below). When submitting samples, ensure to fill out all the necessary information on the submission form, which is obtainable from Analytical Services at Cedara Research Station, or visit:

<http://www.kzndard.gov.za/quick-links/167-soil-analysis>

The Salinity Lab at Cedara tests irrigation water for the following parameters: EC, pH, calcium, magnesium, sodium, potassium, iron, zinc, manganese and copper. The report will include calculated values such as SAR, TDS and the class of water.

For further information on sample submission contact:

Lisa Padayachee: 033 355 9455

[Lisa.Padayachee@kzndard.gov.za](mailto:Lisa.Padayachee@kzndard.gov.za)

or

Sbongile Shongwe: 033 343 8226

[Sbongile.Shongwe@kzndard.gov.za](mailto:Sbongile.Shongwe@kzndard.gov.za)

Physical address:

Soil Fertility & Analytical Services

1 Cedara Road, HILTON, 3245

### **References**

Oluyemi E.A., Adekunle A.S., Adenuga A.A. and Makinde W.O. (2010). Physico-chemical properties and heavy metal content of water sources in Ife North Local Government Area of Osun State, Nigeria. *African Journal of Environmental Science and Technology*. 40 (10), 691-697.

SABS: MA4, Sampling of water for chemical and/or bacteriological tests.

[https://www.nrcs.usda.gov/Internet/FSE\\_DOCUMENT/S/nrcs144p2\\_067124.pdf](https://www.nrcs.usda.gov/Internet/FSE_DOCUMENT/S/nrcs144p2_067124.pdf) [accessed on 18/10/2018]

### **Contact**

Thulani (Vincent) Zuma

Control Scientific Technician

Tel: 033 355 9506

[Thulani.zuma@kzndard.gov.za](mailto:Thulani.zuma@kzndard.gov.za)

KZN Department of Agriculture and Rural Development

Directorate: Agricultural Crop Research Services

Sub-directorate: Analytical Services

Division: Soil Fertility, Cedara

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