



Deutscher Tropentag, October 9-11, 2002, Witzenhausen  
“Challenges to Organic Farming and Sustainable Land Use  
in the Tropics and Subtropics”

## Long-Term Effects of High RSC Water and Ameliorative Strategies

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### Abstract

Consistent use of high RSC water may deteriorate the physical properties and increase pH and SAR of soil. Continuous use may reduce germination / the establishment of seedlings, retard plant growth and lead to a significant reduction in yields. Long-term investigations (1994–2001) with a permanent lay-out were conducted to measure the long-term effects of such water and explore mitigating strategies. The experiment consisted of the treatments; (1) Fallow plot without irrigation, (2) Fallow plot with irrigation of high RSC water, (3) Cropped plots irrigated with high RSC water, (4) Gypsum eq. Water requirement, (5) Sulphuric acid equivalent to gypsum requirement, (6) Combination of gypsum+sulphuric acid @ 50 equivalents and (7) Sesbania green @ 25 + t.ha<sup>-1</sup>.

The design of this experiment was Randomized Complete Block Design (RCBD).

A normal soil was selected at SSRI campus. High RSC water (EC=1.4 dSm<sup>-1</sup> SAR=6.5 and RSC=5.7 m.eq l<sup>-1</sup>) was used to irrigate wheat, maize fodder and rice crops. It was observed that soil pH and SAR was significantly increased after three years consistent irrigation of this water. Soil bulk density was enhanced whereas porosity and hydraulic conductivity were reduced significantly when no management strategies were adopted. Resultantly the crop yields were also cut short appreciably. However, mitigating strategies like application of gypsum, sulphuric acid and their combination as well as sesbania green manure proved successful to counter the ill effects of high RSC water on soil properties (chemical and physical) and crop yields. The yield of crops in the eight year was found to be almost 50% higher in the management treatments (T4–T7) compared with the sole use of high RSC water because the soil became sodic here. No significant difference was found within the ameliorative strategies.

**Keywords:** High RSC water, irrigation, soil degradation