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# Water requirement of rice and irrigation technics in Morocco

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**Abstract.** In Morocco, rice is cultivated on about 8000 ha. The crop is relatively new and entirely mechanized. Rice production is concentrated in the Gharb region (north western region) on flat heavy soils. The growing season extends from May through November. The average grain yield for the period 1949–1993 varies from 2.5 to 5.9 tons/ha and the cultivated area from 600 ha to 8000 ha.

This crop undergoes many constraints which are technical (soil levelling, disease, and low rate of utilisation of certified seeds), socio-economic (low rice consumption: 1kg/person/year) and climatic (mainly precipitations). Water availability is the most limiting factor. Low rainfall affects water storage in the dams thus limiting the increase of the rice area.

In the Gharb region, the irrigation requirement is estimated at about 17 000m<sup>3</sup>/ha. However, the exact water requirement for rice, under Moroccan conditions, remains unknown.

To estimate the irrigation requirement and to develop a better irrigation management, it is necessary to determine the actual water requirement of crops grown, as the first step. Further, the most economic irrigation management has to be determined. The main objective is to save water so as to expand the area under rice cultivation.

**Keywords.** Rice – Water requirement – Irrigation management

## I – Determining the water requirement of rice under Moroccan local conditions using the “tanks method”

### 1. General characteristics of the experimental site:

The site of the experimentation is the main region of rice having the following characteristics:

- Longitude: 6° 21 40
- North latitude: 34° 31 21
- Altitude 10,5m
- Rainfall: 450–530 mm (about 80% between October and April; from June to September the rainfall is about 9.2 mm)
- Temperature: 9.7–17.2°C minima ; 21.8–29.5°C maxima
- Relative humidity: 80–90%
- Soil: Silty-clay (clay is about 27%)
- Water: EC = 1.16 mmhos/cm
- Depth of water table: ≥ 20 m

### 2. Material and methods

#### A. Equipment used

Two sets of metal tanks are placed in a field of rice growing outside the tanks. One set is sealed at the bottom, the other is bottomless. Each set contains two treatments: with and without rice.

The dimensions of each tank are 75 cm x 75 cm x 100 cm. A meter stick is attached to each tank in order to measure the water depth.

All the tanks are placed in the paddy field at 80 cm deep, the remaining 20 cm being above the soil surface. Four tanks are used for each treatment representing four replications. Therefore, sixteen tanks are placed at random in four rows in the field.

### **B. Water measurement**

Every day, each tank is refilled with water at a level of 10 cm. The frequency for registering the amount of water lost is once a day: at 9.00 a.m. The difference between two registrations for two consecutive days gives the amount of water used during the last 24 hours. The tanks are refilled up to the original depth. Each tank gives one or more of the components of the water balance equation.

For measuring the irrigation water in the field, we placed a flume in the straight section of the channel, at the entrance of the field. The registration frequency is once per hour during the time of irrigation.

For a check of our results, we have also placed a sloping gauge (meter stick) in the field in order to measure the irrigation requirement (Evapotranspiration + Seepage and percolation). The frequency of reading is once a day: at 9.00 a.m. The results between two lectures for a two-times period indicate the change in the water level and the consumption of water by rice.

## **II – Results**

The results will be published at the end of the study in 1997.

