

## Effect of Prolonged Irrigated Fodders on Soil Key Parameters and their Agronomic Water Use Efficiency.

By:  
Muhammad Bilal Anwar  
2006-ag-1434  
ICDD Scholar  
M.Sc.(hons) Soil Science

Supervisor:  
Dr. Anwar-ul-Hassan

## Introduction

- Good soil structure is an essential element of healthy and sustainable agro-ecosystems.
- It promotes the development of extensive plant root systems.
- It enhances the use of water and nutrients and in doing so buffers plants against drought and other adversity.
- Food and fodder shortage in arid and semi-arid regions force farmers to use marginal quality water.

- It results in low quality, reduced production and an adverse impact on soil properties.
- Lack of management, overgrazing, wind erosion, high summer temperatures, low precipitation, lack of irrigation water and termite attack are the major problems limiting agricultural production in the Cholistan.
- The native forage plants of the Cholistan desert are vanishing due to overgrazing which is most severe in winter (July to October).

- The soil in the arid zone is characterized by neutral or high pH (7.0–8.7), high calcium carbonate content, and low organic matter.
- Several soil types occur in the desert region, some of which can be utilized for agriculture.
- Deserts soils have the problem of high salt content mainly NaCl.
- One of the typical features of the arid or semi-arid zones is the lack of natural sources such as production land and water.
- The main purpose of the study is to check the performance of irrigated fodder in desert soil and its effect on soil key parameters.

## Research plan

- Factor A: Crops
- Sorghum
  - Pearl millet.
- Factor B: No. of Irrigations
- I<sub>1</sub> = 2 irrigations
  - I<sub>2</sub> = 3 irrigations
  - I<sub>3</sub> = 4 irrigations

**Replication:** 4  
**Total units:** 24  
**Experimental design:** Split plot design

## Lay-out

| Sorghum        |                |                |                |                |                |                |                |                |                |                |                |
|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| R <sub>1</sub> |                |                | R <sub>3</sub> |                |                | R <sub>2</sub> |                |                | R <sub>4</sub> |                |                |
| I <sub>1</sub> | I <sub>2</sub> | I <sub>3</sub> | I <sub>3</sub> | I <sub>2</sub> | I <sub>1</sub> | I <sub>2</sub> | I <sub>1</sub> | I <sub>3</sub> | I <sub>1</sub> | I <sub>3</sub> | I <sub>2</sub> |
| Water channel  |                |                |                |                |                |                |                |                |                |                |                |
| Pearl millet   |                |                |                |                |                |                |                |                |                |                |                |
| I <sub>1</sub> | I <sub>2</sub> | I <sub>3</sub> | I <sub>3</sub> | I <sub>2</sub> | I <sub>1</sub> | I <sub>2</sub> | I <sub>1</sub> | I <sub>3</sub> | I <sub>1</sub> | I <sub>3</sub> | I <sub>2</sub> |

## Sampling

**Sampling depth: 0.6 m**

- 0–0.15 m
- 0.15–0.3 m
- 0.3–0.45 m
- 0.45–0.6 m

## Soil physical parameters

I will analyze the following soil physical properties.

- Bulk density.
- Particle density.
- Porosity.
- Texture

## Soil chemical parameters

I will determine the following soil chemical parameters.

- EC
- pH
- $\text{CO}_3$
- $\text{HCO}_3$
- $\text{Cl}^-$
- TSS
- CEC
- Ca + Mg
- Na
- SAR
- ESP
- Organic matter

## Objectives

- To explore the desert land for farm production.
- To evaluate the agronomic water use efficiency of fodder crops.
- To determine the effect of fodder on soil chemical parameters.
- To check the effect of fodder on soil physical parameters

## Progress

- I visited the live stock farm situated at Jugait–Peer Bahawalpur on 21<sup>st</sup> may 2011 and got some basic information about the farm like irrigation source then set up my research plan.
- I did pre sowing sampling on 22<sup>nd</sup> July 2011.
- I performed sowing of trial on 30<sup>th</sup> July 2011.
- Now I am doing analysis in laboratory

Thanks