Tropentag, September 9-11, 2020, virtual conference

"Food and nutrition security and its resilience to global crises"

Using the Best Land Preparation Leads to an Increase in Crop Productivity in Sudan

Majdaldin Rahamtallah Abualgasim Mohammed[1], Hanadi Mohamed Shawgi Gamal[2]

[1] *National Center for Research, Natural Resources and Desertification Inst., Sudan*
[2] *University of Khartoum, Fac. of Forestry; Forest Products and Industries, Sudan*

Abstract

The main purpose of tillage operations is to prepare the appropriate cradle for seeds by dismantling and loosening the soil and uprooting the grass plants which grow there. Success or failure of crop production depends on a good preparation of the land. In addition, tillage changes the physical properties of the soil. This study investigated the best tillage methods under desertified environments, in order to reduce costs of traditional tillage so as to increase crop production of the land. To achieve the objectives of this study, two tractors with different drag force were used: the first tractor was used as a tester and the second one as an auxiliary. Two primary ploughs (disc plough) and a chisel plough, and two secondary ploughs (disc harrow plough and chisel plough) were used and compared to an animal-drawn plough. Tillage parameters have been investigated. In a first test, the land has been prepared by using chisel plough to a depth of 30 cm, then opening furrows using Ridger plough. The second test used a disc plough to a depth of 20 cm, and then furrows have been made using a Ridger plough. In a the third test the harrow plough was used to a depth of 25 cm then furrows were made using a Ridger plough. The fourth test opened the furrows using a Ridger plough to a depth of 30 cm. The fifth test opened the furrows using the animal-drawn plough to a depth of 15 cm. The results recorded that a field efficiency for the chisel plough of 90.5, for the disc plough of 85.5, harrow plough 70.5, Ridger plough 50.5, and the animal-drawn plough showed an efficiency of 15.5. The results further showed that the fuel consumption in litter per ha recorded were 6.50, 3.30, 2.60 and 2.10, for the chisel plough, the disc plough, the harrow plough, and the Ridger plough, respectively. The study recommended that the most suitable practice is the Ridger plough which recorded the highest field efficiency and less fuel consumption in order to enhance soil moisture and increase crop productivity.

Keywords: Desertified land, land preparation, Sudan, tillage

Contact Address: Majdaldin Rahamtallah Abualgasim Mohammed, National Center for Research, Natural Resources and Desertification Inst., Khartoum, Sudan, e-mail: majdaldin_1974@yahoo.com