البحث الرابع (٤)

Irrigation and Drainage Systems 15: 327–353, 2001.

Influence of cultural practices on the performance of long level basins in Egypt*

Z. EL-HADDAD[1], A.J. CLEMMENS[2,*], M. EL-ANSARY[1] & M. AWAD[1]
[1]*Zagazig University, Moshtohor, Egypt;* [2]*U.S. DA/ARS, U.S. Water Conservation Laboratory, Phoenix, AZ, USA (*corresponding author; e-mail: bclemmens@uswcl.ars.ag.gov)*

Accepted 1 October 2001

Abstract. Several field studies were conducted to better understand the influence of cultural practices, inflow rate and field conditions on the performance of modern surface irrigation systems in Egypt. Field data were collected on wheat and cotton under Egyptian conditions in order to estimate infiltration, roughness and performance parameters. Tests were made with a variety of inflow rates and a variety of cross section shapes (flat or furrowed) and several furrow spacings. These studies provide information on expected values of infiltration and roughness parameters typical of cracking clay soils in the Nile Delta, as well as guidelines and recommendations for use of long-level basins in Egypt.

Key words: developing countries, flow resistance, infiltration, irrigation design, level-basin irrigation, surface irrigation

Introduction

Significant changes are taking place in Egyptian farming practices. More and more land each year is tilled with tractors, and improved inputs such as certified seed and fertilizers are being used extensively. However, little change is occurring in surface irrigation practices. Improvements in surface irrigation performance are possible, but only with proper field preparation.

Currently, many fields are tilled as long strips or furrows (often 100 m or more in length). However, because of poor land preparation (i.e., poor grading and tillage practices), the fields are broken up into small blocks for irrigation. This practice has been shown to use water very inefficiently and to take land out of production (El-Haddad 1992 and El-Sahrigi et al. 1993). Improvements in irrigation efficiency and production have been demonstrated on experiment stations where irrigation of long strips has been tested (for example, Osman 1988; El-Yazal & Ismail 1986). However, Egyptian farmers

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