

ECONOMIC ASSESSMENT OF BIOFERTILIZERS USE FOR MAIZE PRODUCTION IN EGYPT

Mostafa Bedier¹ Mohamed Abdel Monem Hamdy Khalifa

Abstract

A repeated measurements split plot design experiment was conducted during the 1996 and 1997 growing seasons at Giza Research Center. The experimental site represents the old irrigated land of Egypt. The main objective of this study was devoted to compare between different types of bio- and chemical-N fertilizers and combination of them to develop a sustainable type of fertilizer practice for maize production using less inorganic fertilizers specially nitrogen. Adoption of these practices will contribute to the sustainability of maize production in the old land by decreasing the cost of production and environmental pollution. Results of this field experiment indicated that using commercial biofertilizer "Siraline" or "Siraline" plus half dose of N-fertilizer resulted in a significant increase in maize yield, at the same time save half of the N fertilizer applied to maize. Meanwhile, economic analysis indicated that "Siraline" plus half dose of N-fertilizer had in average higher net benefit, profitability ratio (B/C) as compared to the other types and higher marginal rate of return (MRR) value than as compared to type N fertilizer. On the other hand, using "Siraline" resulted in less grain yield and net benefit compared to N fertilizers, yet it had the highest MRR values and B/C ratios higher than that of N-fertilizer. The study proved that using biofertilizers resulted in high economic return and a friendly environmental practice.

Introduction and Background

In Egypt, chemical fertilizers are used heavily to maintain soil fertility and to ensure crop productivity. Badiane *et al.* (1994) reported that Egypt's consumption of fertilizers is 10 times more than the average for the whole world. Nitrogen fertilizer consumption was approximately doubled in 1993 as compared to 1980 (IFDC, 1993). With high rates of chemical fertilizers being applied to different crops, low N-recovery and low irrigation water efficiency, a significant amount of the applied N-fertilizer is lost (Hammisa *et al.*, 1987; Abdel Monem *et al.*, 1994 and Soliman and Abdel Monem, 1994). Due to increasing international about environmental effect of N lost from fertilizer as leached nitrate or as volatile N gases, it is likely that there will be a resurgence in the utilization of biofertilizers to compete or to replace fertilizer inputs (Peoples *et al.*, 1994). In fact, biological fertilizers offer an economically attractive and environmentally sound means of reducing inputs of chemical fertilizers.

Maize is one of the major summer cereal crops in Egypt. It is cultivated in an area of about 0.84 million hectares. Maize consumes high amount of N fertilizers. The rate of applied nitrogen to fertilize maize crop increased from 117 kg N/ha in 1970 to 317 kg

¹ Mostafa Bedier (Socio-economist), Mohamed Abdel Monem (Soil Scientist) and Hamdy Khalifa (Water Scientist) at the Nile Valley and Red Sea Regional Program, ICARDA, Cairo, Egypt. P.O. Box 2416, Cairo, Egypt.