Internat. J. Agric. Sci. Vol.4 No.1 January, 2008 : 51-56

Economics of irrigation practices for cotton

H. D. RANK
Department of Soil Water Engineering, College of Agricultural Engineering & Technology, Junagarh Agricultural University, JUNAGADH (GUJARAT) INDIA

ABSTRACT

The average of two years(2003-04 and 2004-05) data on cotton yield and water consumption observed in the field experiment adopting 3-factorial split plot design at JAU farm, Junagadh were used to find the economic of different irrigation practices. The highest benefit cost ratio of 2.05 for cotton cultivation under drip was obtained by irrigating cotton at IW/CPE ratio of 1.0 for the first 3 stages and then at IW/CPE of 0.4 in the last stage. While under border irrigation, it was 1.72 when irrigated at 20% depletion of ASM during the first 3 stages and then at 80% depletion of ASM during the last stage. The highest benefit-cost ratio of drip adoption in cotton was 2.84 when irrigated at IW/CPE of 0.6 throughout the season. The drip system adoption is not economically feasible for two extreme conditions *i.e.* highly water deficit and fully water supply conditions

Key words : Growth periods/stages, Water application level, Water consumption, Cotton yield, Net return, Economics.

INTRODUCTION

Historically, irrigation management emphasized the complete avoidance of water deficits. In years of short supply, irrigated acreage was reduced so that full irrigation requirement could be met. Planning of this type is inadequate when water shortage become common, competition for water increases and irrigation investments rise to large proportions of national incomes. Most irrigation projects in India have already begun to experience water shortages at several times during a crop season. As the development of irrigation networks nears completion, these shortages are likely to increase. Irrigation planning in the future is; therefore, more likely to be based on a purposeful imposition of water deficits, controlled in intensity and times, to meet desired targets. Deficient irrigation ensures optimum and sustainable agricultural production in a given region, and maximum incomes of the growers if irrigation water resources are limited or expensive (Stegman *et al*., 1980)

Deficit irrigation practices differ from traditional water supplying practices. The main objective of deficit irrigation is to economies the limited water by eliminating irrigations at certain stages of crop growth that have little impact on net return. The resulting yield reduction may be small compared with the benefits gained through diverting the saved water to irrigate other crops or increasing the acreage of same crop for which water availability would normally be insufficient (English *et al.*, 1990). Through the use of deficit irrigation, crops are purposely irrigated less during plant growth stages that are relatively less sensitive to water stress as regards the quality and quantity of the harvestable crop yield. Effective water use can only be realized when the price of the additional crop yield produced would be higher than the cost of water used(Hexem and Heady, 1978). Identifying growth stages of particular cultivars under local conditions of climate and soil fertility allows irrigation scheduling for both optimum crop yield and maximum return from scarce water resources. Before implementing a deficit irrigation programme, it is necessary to know net return responses to water stress, either during defined growth stages or through the whole season(Stewart, *et al.*, 1977).

The cotton is highly remunerative crop because of higher yield due to favorable soil and climatic conditions in the Saurashtra Region of Gujarat. However, water scarcity is the main constraint in its adoption for large scale (Rank, 2005). Increasing demand for water, declining water tables and increasing energy cost for pumping emphasize the need for conserving water in irrigated agriculture. Irrigation for maximum yield is no longer feasible in water scared areas. Deficit irrigation through efficient irrigation method is one of the major ways to maximize the net return from limited land water resources with farmer. The documented research evidence was not yet available for this soil and agro climatic condition. Thus, the lack of information on these important aspects provided the necessary impetus to