Abstract

Mayor production costs of irrigated corn are the use of commercial fertilizer (25 %), irrigation water (18 %) and pest (insect) control (13 %). The objective was to determine the optimal use of water, nitrogen and plant population to obtain maximum yields. This research was conducted in 1991, on acidic sandy loam soil with low natural fertility. A complete randomized block design and divided plots were used. The principal plots were the depletion of humidity in the soil and the sub-plot was a combination of the nitrogen applied and the plant population; each treatment was replicated four times. To evaluate the treatments, data on the following were taken: foliage area index, yield and insect damage, which were later analyzed with the established design and the economic analysis. The results indicated that the highest moisture depletion was 68.3 cm. In the statistical analysis an interaction between the following variables was observed: foliage area index, and total yield from the physiological point of view with the best grain yield (13.5 t ha⁻¹), moisture depletion was 60 %, when the nitrogen application was 400 kg ha⁻¹, and the plant population was 101 300 plants ha⁻¹. The economic analysis indicates that the best alternative was 30 % soil humidity depletion when 250 kg ha⁻¹ of N was applied and the plant population was 89 000 plants ha⁻¹. This produced an average yield of 13.2 t ha⁻¹ and a net gain of 5833.00 pesos ha⁻¹.

Keywords

Nutrition, evapotranspiration, profitability.