Scheduling soybean irrigation from pan evaporation

Kamel Milad Yousef

Three field experiments were carried out at the Agricultural Research Center , Giza,Egypt, during 1986, 1987 and 1988 seasons to schedule soybean irrigation according to the Class A pan evaporation records under three sowing dates. The effect of sowing dates as well as irrigation regimes on soybean growth,yield components, yield , some chemical properties and the crop water use were studied. Also,evaluating the potential evapotransp-iration estimated by the Class A pan with some different formulae i.e. modified Penman , Jensen and Haise Tura and Blaney and CriddleThe soybean Crawford cultiva (group IV)was used during the three seasons of the study. The experimental design was split-plot design with four replications. The main plots represented the sowing date treatments whereas, the sub-plots were subjected to irrigation regime treatments. The treatments were as follows:- A)- Soybean sowing dates:- 1-D1 : early sowing (mid-April). 2-D2 : moderate sowing (early May). 3-D3 : late sowing (late- May). The period between intervals ’mere three weeks. - 168 -B)- Irrigation regimes:- 1- Il : irrigation at 0.6 accumulative pan evaporation. irrigation at 0.8 accumulative pan evaporation. irrigation at 1.0 accumulative pan evaporation. irrigation at 1.2 accumulative pan evaporation. irrigation at 1.4 accumulative pan evaporation. The available soil moisture in the soil profile from the soil surface till 60 cm.,depth has been converted to units of water depth in mrn.,and was found to be 105.0 mm. The crop was irrigated when the water balance in the root zone of soybean plant(from the soil surface and down to60 cm.,depth) reached zero,i.e.the accumulative daily pan evaporation records multiplied by the irrigation rates namely 0.6 , 0.8 , 1.0 , 1.2 and 1.4 are equal to available soil moisture or to 105.0 mm. The soil was clay loam with pH value of 7.4. The area of sub-plot was 14.4 m., (4 x 3.6 m),with six ridges of 60.0 cm., appart. Each plot was isolated from other plots by leavies 1.2 m., to avoid the effect of lateral moveme-nts of irrigation water. Soybean seeds at the rate of 35.0 kg.seeds/faddan were planted in hills of 10.0 cm., appart with two plants/ hill. The phosphorus fertilizer was applied at the rate of 15.5 o P205/faddan in the form of calcium super phosphate 2- 12 : 3- 13 : 4- 14 : 5- 15 : - 169 - before planting. Nitrogen fertilizer was added in the form of amonium nitrate at the rate of 90.0 kg.N./faddan in three doses. of growing soybean were used during the three seasons. The irrigation regime of the different treatments were applied after the 1st irrigation till the end of the growing season.