

Research Paper :

Selection of water production function for sunflower

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ABSTRACT

The experimental data of sunflower, which was carried out at RAU, Pusa to study the response of irrigation and nitrogen on the yield, were analysed to develop water production function of sunflower. Stress day (SD) was considered to quantify crop water stress and it was measured in different stages of crop growth sub- periods. The yield ratio (Y/Y_m) was related to stress day (SD) in different stages of crop growth sub – periods. It was found that the linear model was best suitable and for this the IInd stage, vegetative to seed development was most sensitive to water stress for sunflower.

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Key words : Production function, Sunflower, Stress day, Crop growth sub- periods

The backbone of the economy of an agriculture-based country is its agricultural production. Irrigated agriculture often suffers from inadequate water supply leading to production much below the potential level. Optimum amount of water application at the appropriate time is of paramount importance in increasing crop yield. With limited available water supplies, sequencing of crop water deficits can result in increased irrigation efficiency. Such sequencing can be possible if the effect of different irrigation levels on crop yield could be quantified and evaluated. In order to quantify effect of irrigation on crop production, water production function can be used as a tool. Various methods have been used to developed water production function for finding out a suitable schedule of irrigation for sunflower. Harbovesiky *et al.* (1968) discussed the properties of some important production function and indicated some guidelines for selection of function. Gupta *et al.* (1987) developed production function for groundnut and finger millet. Dabral (1986) and Tripathy (1988) reported various types of production function for different crops. Hossain (1999) work to response of rapeseed (*Brasica napus*) to irrigation at different growth stage. Prabhudeva *et al.* (1998) found soil moisture stress and drought susceptibility index in sunflower.

Sunflower popularly known as 'Surajmukhi' is a

familiar plant in India. Sunflower as an oilseed crop is a new introduction in India. Since it has 45-50 per cent good quality oil and high amount of quality protein in cake, it has good scope in Indian agriculture. Sunflower holds great promise because of its short duration, photo-insensitivity, wide adaptability and drought tolerance. It can be grown at any time of the year and can serve as an ideal catch crop during the periods when land is otherwise left fallow. Sunflower oil is a rich source of linoleic acid, which helps in washing out cholesterol deposition in the coronary arteries of heart and thus is good for heart patients. Oil is also used in manufacture of soaps and cosmetics. This paper mainly deals with the selection of water production function based on stress day, for sunflower in Bihar.

METHODOLOGY

The experimental data regarding the effect of irrigation and nitrogen on yield of sunflower were collected during the period 1993-94 and 1994-95. These experiments were conducted at the Research Farm of Rajendra Agricultural University, Pusa, Bihar located at 25.98°N latitude, 85.67°E longitude and at an altitude of 52.00 m above MSL. The experiment was conducted with four levels of nitrogen *i.e.* 9, 20, 40 60 kg/ha with three replications under Randomized Block Design (R.B.D).