

Water Crop Productivity of Faba Beans as Affected by Irrigation Deficit and Farmyard Manure additions

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Abstract : Conservation of adequate levels of soil organic matter in soils is prerequisite for prospective and high production of crop; therefore this work was carried out in Research and Production Station, NRC, El-Nubaria, El-Beheara Governorate to investigate the impact of organic manure application (10 and 15 ton/fed) and irrigation treatments (90 and 75 % from evapotranspiration, ETo) on faba bean (*Vicia faba* L. Giza 461) plant growth, productivity and water crop productivity.

The obtained results showed that plant growth characters i.e. total seeds/plant and seeds weight and seed index were clearly improved as a result of applied both factors under investigation. Decreasing irrigation water by 15 % from 90 to 75% of ETo improved total seeds per plant and seed weight by 14.0 and 28.0 % relative to the control (90 % of ETo). While FYM at 15 ton /fed increased the same characters by 45 and 47 % and 10 ton/fed by 9 and 21 % as compared with control. FYM under 90 % irrigation treatment comparing with control. Whereas, under irrigation treatment of 75 % increased same variable progressively. Irrigation treatment 75 % from ETo moderately enhanced seed index by 5.6 % relative to the 90 %. Application 10 and 15 ton FYM /fed increased seed index by 38 and 7.1 % relative to the control, respectively.

Application of FYM increased most of the studied parameters and increasing water deficit from 90 to 75 %from ETo associated with increasing studied plant characters. Irrigation at 75 % from ETo had a promotive effect with rate of increasing 46.58, 6.56, 0.7 and 1.25 % comparing with 90 % ETo for crude protein, N, P, K content in seeds of faba bean, respectively.

The highest values of yield and water crop productivity were obtained after FYM application rate 15 ton/fed (1455.8, 1589.7 kg/fed and 2.42, 3.52 kg/m³), under 90 and 75 % from ETo irrigation treatment and increasing FYM from 10 to 15 ton/fed have been improved by 18.7 and 18.6 % in same sequences comparing with control.

Keywords: Faba Beans, irrigation deficit, farmyard manure, water crop productivity.