

RESPONSE OF CANOLA (*Brassica napus* L.) TREATED WITH SOME SOIL CONDITIONERS TO DROUGHT STRESS

Al-Thabet, S. S.⁽¹⁾; A. A. Leilah⁽¹⁾ and I. Al-Hawass⁽²⁾

(1)Crops & Range Department and (2) Soil Science Department,
College of Agric. and Food Sci., King Faisal University,

ABSTRACT

. A split plot in randomized complete block design with four replicates was used. The main plots were assigned to three irrigation intervals, i.e. irrigation every 7, 14 and 21 days, where the amount of irrigated water were 8400, 6800 and 6000 m³/ha, respectively, (Table 1). This study was performed during the winter seasons of 2001 and 2002 at the Agricultural and Veterinary Training and Research Station, King Faisal University. The purpose was to investigate the effect of organic manures (60, 80 and 100 m³/ha) and gypsum (0, 5 and 10 t/ha) on growth and yield of canola "CV Pactol" under different irrigation intervals (7, 14 and 21 days, where the amount of irrigated water were 8400, 6800 and 6000 m³/ha/season). The main findings revealed that irrigation intervals significantly affected all estimated characters, except stem diameter. Irrigation every 7 days induced marked increases in plant height, number of branches and pods/plant, number of seeds/pod, weight of seeds/plant, seed and oil yields/ha and water use efficiency. On the other side, exposure canola plants to drought by prolonging irrigation intervals to 21 days produced the lowest means of the aforementioned traits. Organic manure had marked effects on number of pods/plant, number of seeds/pod, weight of seeds/plant, seed and oil yields/ha and water use efficiency. The application of organic manure with rates of 60, 80 and 100 m³/ha was associated with seed yields of 3.202, 3.622 and 3.897 t/ha, respectively. Gypsum application with the rate of 10 ton/ha significantly improved most of estimated growth characters as well as seed and oil yields/ha and water use efficiency. Seed yield increased from 3.023 to 3.452 and 4.245 t/ha and oil yield increased from 1110.6 to 1277.2 and 1583.1 kg/ha with increasing gypsum rates from 0 to 5 and 10 t/ha. The interaction between irrigation intervals and organic manure levels significantly affected seed and oil yields/ha as well as water use efficiency. The highest values of seed and oil yields/ha and water use efficiency were produced with irrigating canola every 7 days and adding the organic manure at a rate of 100 m³/ha. Meanwhile, the lowest values of aforementioned traits were produced with irrigation canola every 21 days and adding the lowest level of organic manure (60 kg t/ha). The interaction between irrigation intervals and gypsum levels had marked effects on seed and oil yields/ha as well as water use efficiency. Irrigating canola every 7 days and adding gypsum at the rate of 10 t/ha produced the highest seed and oil yields/ha and water use efficiency. On the contrast, the lowest averages of aforementioned traits were obtained with irrigation every 21 days in case of no gypsum application. In general, it can be concluded that maximum seed and oil yields/ha as well as water use efficiency could be achieved with irrigating canola plants every 7 days and adding 100 m³/ha organic manure and 10 t/ha gypsum.