

The effect of salicylic acid and potassium sulphate on safflower (*Carthamus tinctorius*) yield under the water stress

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ABSTRACT:

Physiological stress indicates the environmental pressures which affect the plant physiology and change it. The experiment was conducted as split plot in randomized complete block design with three replications on safflower (*Carthamus tinctorius*) from 2015 to 2016. Treatments were: 1) Irrigation: without stress (irrigation after 70 mm evaporation from evaporation pan class A) and drought stress (irrigation after 150 mm evaporation from pan class A) was considered as the main factor and the concentration of salicylic acid with three levels (0, 100 and 200 mg L⁻¹) as the first sub-factor. The second sub-factor includes the concentrations of three levels of potassium sulphate (0, 0.5 and 1 mg L⁻¹). The interaction between drought stress and potassium sulphate and also potassium sulphate and salicylic acid were significant on the induction of plant height. With regard to this, the comparison between salicylic acid and potassium sulphate interaction on the safflower plant height and the highest plant height (107.3 cm) was obtained by using 200 mg salicylic acid plus 1 mg L⁻¹ of potassium sulphate. The combined analysis of data indicated that interaction between potassium sulphate × salicylic acid on the grain yield was significant. The highest grain yield (1550 kg ha⁻¹) belonged to the foliar application of 100 mg salicylic acid and 0.5 mg L⁻¹ of potassium sulphate interaction. The interaction of salicylic acid and potassium sulphate was significant on the biological yield, and the highest biological yield was obtained with 200 mg L⁻¹ of salicylic acid and 0.5 mg L⁻¹ of potassium sulphate. Therefore, in order to compensate for some of the harmful effects of stress and enable the plant to return to normal growing conditions after re-watering, foliar application of such chemical compounds on plant can be effective and plays an important role on the resistance of plant to drought.

Keywords:

Carthamus tinctorius, Salicylic acid, Potassium, Drought.