

عنوان مقاله:

Wheat Straw Biochar Interacts with Irrigation Water and Irrigation Water Salinity to Improve Water Use Efficiency and Yield of Faba Bean

محل انتشار:

دوفصلنامه تحقیقات کشاورزی ایران، دوره 42، شماره 1 (سال: 1403)

تعداد صفحات اصل مقاله: 14

نویسندگان:

Mohammad Reza Bahadori-Ghasroldashti - Water Engineering Department, School of Agriculture, Shiraz University, Shiraz, I.R. Iran

Fatemeh Razzaghi - Water Engineering Department, School of Agriculture, Shiraz University, I.R. Iran Drought Research Center, Shiraz University, I.R. Iran

Ali Reza Sepaskhah - Water Engineering Department, School of Agriculture, Shiraz University, I.R. Iran Drought Research Center, Shiraz University, I.R. Iran

Emmanuel Arthur - Department of Agroecology, Faculty of Technical Sciences, Aarhus University, Denmark

خلاصه مقاله:

Faba bean, although, is widely cultivated, its yield is affected by drought and salinity stresses. Biochar can potentially reduce the negative effects of drought and salinity stress. In this study, the interaction effects of biochar, irrigation water regimes and irrigation water salinities on faba bean's yield, crop water use efficiency (CWUE) and ion concentrations were evaluated under greenhouse condition. The treatments were biochar (0, 1.25 and 2.5% w/w, as B0, B1.25 and B2.5, respectively), irrigation water regime (50, 75 and 100% of crop water requirement, as I50%, I75%, and I100%, respectively) and irrigation water salinity (0.6, 4 and 8 dS m⁻¹, as S0.6, S4 and S8, respectively), that were arranged in a factorial arrangement using a complete randomized design with four replications. Biochar applied at 2.5% w/w significantly decreased actual crop evapotranspiration by 11% in comparison with that obtained in B0. The maximum dry seed yield (14.4 g pot⁻¹) was obtained under B2.5S0.6I100% treatment. The CWUE of 0.47 kg m⁻³ for B2.5S8I50% was 1.27 times that obtained in B0S0.6I100%. Seed sodium concentration under B2.5S8I50% (0.34 g kg⁻¹) was significantly lower than that obtained in B0S8I50% (0.55 g kg⁻¹). Biochar application increased the plant tolerance to salinity, as the maximum threshold of soil saturated electrical conductivity of 5.2 dS m⁻¹ was observed under B2.5I50% treatment, which was higher than 2.5 dS m⁻¹ obtained in B0I50% treatment. Finally, cultivation of faba bean under 2.5% w/w biochar and 100% non-saline irrigation water level is recommended for maximum faba bean production.

کلمات کلیدی:

Actual evapotranspiration, Sodium absorption ratio, Threshold of saturated electrical conductivity, Yield-salinity function

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1947374>

