system productivity by ~1 t/ha/year with significantly lesser water use (50%) and higher income (INR ~45000 /ha/year) and zero water foot prints. Cereal systems with SSDI in NW India is a potential game changing technology for sustaining productivity while conserving natural resources and ensuring food security under the emerging climate change scenario.

Keywords: Conservation agriculture, Sub-surface drip irrigation, Climate smart agriculture

Effect of Zinc and Iron Fertilization on Mustard Yield under Salt Affected Soils

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Zinc (Zn) and iron (Fe) deficiencies are mostly found in salt affected soils in arid and semi-arid tracts of India. To improve crop productivity in these soils, Zn and Fe sufficiency are to be ensured. Keeping in view these constraints, the field experiment was conducted during 2013-14 and 2014-15 under pearl millet-mustard cropping system to evaluate response of methods and application rates of Zn and Fe fertilizer to mustard crop. The salt tolerant mustard (*Brassica juncea*) variety CS-54 was sown with 12 treatments of Zn and Fe i.e. T_1- Control, T_2- 5 kg Zn ha^{-1}, T_3- 6.25 kg Zn ha^{-1}, T_4- 7.5 kg Zn ha^{-1}, T_5- 7.5 kg Fe ha^{-1}, T_6- 10 kg Fe ha^{-1}, T_7- 12.5 kg Fe ha^{-1}, T_8- 5 kg Zn+10 kg Fe ha^{-1}, T_9- 5 kg Zn+10 kg Fe + 10 t FYM ha^{-1}, T_{10}- Foliar sprays of 0.5% $ZnSO_4$ (twice), T_{11}- Foliar sprays of 1% $FeSO_4$ (twice) and T_{12}- Combined foliar sprays (0.5% $ZnSO_4$+1% $FeSO_4$; twice) at 30 and 45 days after sowing of crops. The results showed that the increase in levels of soil application of Zn from 0 to 7.5 and Fe from 0-12.5 kg ha^{-1} increased seed yield of mustard. The maximum yield (22.7 q ha^{-1}) was recorded under T_9, which received 5 kg Zn+10 kg Fe + 10 t FYM ha^{-1} followed by 5 kg Zn+10 kg Fe ha^{-1} (with seed yield of 19.3 q ha^{-1}) over control. The positive correlation was recorded between seed yield and yield attributes with the combined soil application of Zn and Fe with FYM or without FYM. Among the foliar application, highest seed yield (17.2 q ha^{-1}) was recorded under 0.5% $ZnSO_4$+1% $FeSO_4$ (T_{12}) in mustard. Twice foliar application of 0.5% $ZnSO_4$+1% $FeSO_4$ (T_{12}) was equally effective in increasing the yield of mustard with application of 5 kg Zn and 7.5 kg Fe ha^{-1} alone. The combined soil and foliar application of Zn and Fe was found superior than sole soil and foliar application under saline environment. Significant build-up of soil fertility in terms of available macronutrients (N,P & K) as well as micronutrients (Zn, Fe, Cu & Mn) was observed with combined application of 5 kg Zn+10 kg Fe +10 t FYM ha^{-1} as compared to control or sole application of respective nutrient. The results highlighted that combined use of Zn and Fe as soil and foliar application is beneficial option for improving the mustard yield and soil fertility in terms of available Zn and Fe in saline soils.

Keywords: Zinc, Iron, Mustard, Saline soil, FYM