abstract:

Increasing use of chemical fertilizers and pesticides contaminated with heavy metals from waste water for watering plants, concentrations of heavy metals in crops has increased. Two extremely hazardous to human health is the lead and manganese. Way to relieve and prevent the absorption of toxic elements by plants is the use of humic acid and salicylic acid. To investigate the effects of salicylic acid and humic acid Tymar¬Hay the stress of lead and manganese in Imperial, two separate experiments in factorial in a completely randomized design with 3 replications was conducted in 1392 Zabol University. First .zmaysh includes two levels of 12 and 24 mg of lead nitrate Kylv¬Grm soil and humic acid as the first factor with three levels of control, 33 and 333 mg g soil Drkylv as a secondary form of salicylic acid pretreatment seed with three levels of control, 0/1 and 0.5 mM, and the third factor and Second testing includes both the 38 and 76 mg of manganese sulfate Kylv¬Grm soil and humic acid as the first factor with three levels of control, 33 and 333 mg in the second and salicylic acid in the soil Kylv¬Grm seeding with three levels of control, 0/1 and 0.5 mM, respectively, as a third factor. Analysis of variance showed that in the first trial. Lead to impaired absorption of nutrients in plant leaves, plant height, fresh and dry weight of shoot and root, root length and chlorophyll a and b and total carotenoids, the concentration of phosphorus, sodium and potassium decreasedAlso shoot Pb Pb stress, proline, anthocyanins in plants increased. But a band of heavy metals and humic acid soil conditions improve Tghzyh¬Ay increase the number of leaves, plant height, fresh and dry weight of shoot and root, root length, as well as chlorophyll a, b and total carotenoids, anthocyanins, the concentration of phosphorus , sodium and potassium. In addition to the heavy metal band lead concentrations decreased shoot and prolineSalicylic acid also has the same effects were followed by humic acid. Analysis of variance showed in the second experiment. Manganese with impaired absorption of nutrients in plant leaves, plant height, fresh and dry weight of shoot and root, root length and chlorophyll a and b and total carotenoids, the concentration of phosphorus, sodium and potassium decreasedThe stress of Mn, Mn-shoot, proline, anthocyanins in plants increased. But a band of heavy metals and humic acid soil conditions improve Tghzyh¬Ay increase the number of leaves, plant height, fresh and dry weight of shoot and root, root length, as well as chlorophyll a, b and total carotenoids, anthocyanins, the concentration of phosphorus , sodium and potassium. In addition to the heavy metal band shoots and proline concentrations decreased. Salicylic acid also has the same effects were followed by humic acid

Keywords: Heavy metals Humic acid, Garden Cress Salicylic acid

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effects of salicylic acid and humic acid pretreatments in stress lead and manganese in the cress (*Lepidium sativa*)

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