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Department of Agrotechnology

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Title:

Application EDTA and Banzan for Phytoremediation of plum bum-contaminated soils by marigold medicinal plant (*Calendula officinalis*)

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Abstract

The aim of this study was to investigate the possibility of phytoremediation of marigold in the presence of EDTA and Banzan chelators. This factorial experiment was performed as a 2 × 4 × 4 with three replications in a completely randomized design in the crop year 1399-1398 as a greenhouse in the Agricultural Research Institute of Zabol University. Experimental treatments included chelator type as the first factor in 2 levels (EDTA and Banzan), the second factor of chelator concentration in four levels (zero, 0.5, 1, 1.5 mg / kg of arable soil) and the third factor of lead in four Surfaces included (zero, 150, 300, 450 mg / kg of arable land) from lead nitrate source on the amount of lead in the aerial and terrestrial organs of marigold were. According to the results obtained in this study showed that different concentrations of lead nitrate and chelating agents in the soil affected the amount of quantitative and qualitative traits of the plant and the interaction of lead and chelating reduced the amount of photosynthetic pigments in the plant. Plant including total plant weight, fresh and dry weight of roots, stems and leaves affected and caused weight loss in these organs. Dry and wet weight of stems decreased with increasing amount of chelators and lead nitrate. The interaction of lead and chelator on the amount of lead in roots and shoots was effective. The amount of lead in soil at 1% level of EDTA chelator and three levels of 150, 300 and 450 mg of lead nitrate were 4.744, 4.26 and 6.675, respectively. They decreased by 3.6, 48.52 and 31.48%, respectively, compared to the control. The EDTA chelator was more effective than the benzene in phytoremediation by marigold.

Keywords: Lead, Marigold, Phytoremediation, EDTA