The effect of Prometryn Soil Residue on Soil Microbial Biomass and Different Crops Biomass

The environmental risk of herbicides should be evaluated near sites of use, even though basic ecotoxicological tests have been conducted before they can be registered for marketing. For example, triazine herbicides, which are photosynthetic PSII herbicide that considered only slightly or moderately toxic to many susceptible plants, soil microorganisms, mammals and humans, however, concerns have arisen because this herbicide are members of a class claimed to be carcinogenic, or may affect the developments reproductive toxins. For this reason, more reliable evidence is needed to test these claims and investigate their ecological effects. Prometryn is one of triazine herbicides that may leave residual activity in the soil for extended periods, causing injury and yield reduction of susceptible soil microorganisms and crops in rotation. A pot experiment was conducted under greenhouse conditions in order to study the sensitivity of 4 different crops (lettuce, barley, rapeseed and beet) to prometryn soil residue (0.0033, 0.0166, 0.033, 0.066, 0.1 and 0.166 mg. kg-1soil) in Iran, 2014. The plants were thinned to five plants per pot after germination. The pots were kept for 30 days under controlled conditions. Shoot and root biomass production was measured 30 days after emergence. Results showed that the shoot and root dry matter were significantly affected by increasing prometryn soil residue in all crops (p<0.01), but seed emergence was not affected. Crops showed different responses to prometryn soil residues. Based on ED50 parameter rapeseed (0.0137 mg kg-1soil) and barley (0.0282 mg kg-1soil) appeared the most sensitive and tolerant crops to prometryn soil residue, respectively. The other crop sensitivity to prometryn soil residue followed as: rapeseed>lettuce>beet>barely. Based on the mechanism of action of prometryn and its best efficiency on board leaf plants control, the least biomass reduction obtained for barley is understandable. In general, this is safe to plant a susceptible species if the plant-available residue were less than the species ED10 value, and there would be a great risk for different levels of crop damage if the plant-available residue were higher than ED50 values of the species.

**Key Words:** ED50, Microorganism, Persistance, Rapeseed, Triazine