

Abstract

In order to study the effect of soil residue of some sulfonylurea and aryloxy phenoxy propionate herbicides on growth, nodulation and nitrogen fixation of Chickpea (*Cicer arietinum* L.), a pot experiment was conducted using factorial arrangement in completely randomized design with three replications. Factors included herbicides type in four levels (Diclofop-methyl, fenoxaprop-p-ethyl, sulfosulfuron and metsulfuron-methyl+sulfosulfuron), herbicide residue in soil in eight levels (0, 2.5, 5, 10, 15, 20, 30, and 40 percent of recommended dose for each of herbicides) and pea genotype in three levels (Hashem, ILC 482, KK). After mixing the herbicides with soil and planting, plants were maintained until the beginning of reproductive stage. At early stage of reproductive, shoot and root biomass, number of root nodules and total nitrogen content of plants were measured. Results showed that sulfosulfuron and metsulfuron-methyl+sulfosulfuron herbicides soil residue and aryloxy phenoxy propionates had the highest and the lowest effect on mentioned traits of plants, respectively. Increasing of sulfonylurea herbicides residues, all measured traits decreased significantly. But aryloxy phenoxy propionates herbicides had not significant effect on plants. Based on ED₅₀ index, the lowest (0.0025 mg per kg of soil) and the highest (0.0047 mg per kg of soil) of sulfosulfuron herbicide for shoot biomass, were observed in Hashem and ILC482 genotypes, respectively and in metsulfuron-methyl+sulfosulfuron herbicide the lowest (0.0057 mg kg⁻¹ soil) and the highest (0.0837 mg kg⁻¹ soil), ED₅₀ index were observed in ILC482 and KK genotypes, respectively. Results indicated that herbicide residues in soil reduced significantly the number of nodules in pea genotypes. Sulfosulfuron and metsulfuron-methyl+sulfosulfuron herbicides residues reduced 37.55 and 34.22 percent of root nodules, respectively. it is also diclofop-methyl and fenoxaprop-p-ethyl decreased 5.58 percent and increased 7.88 percent of nodules of pea genotypes. there was a significant difference in pea genotypes to herbicides soil residue. Genotype of hashem had the highest sensitivity to sulfonylurea herbicides; and the highest positive effect of fenoxaprop-p-ethyl herbicide was indicated in Hashem genotype. Considering the results of the study, it can be said that Hashem genotype shows more response to herbicide soil residue compared to the other genotypes.

Key words: aryloxy phenoxy propionates herbicides, ED₅₀ index, Herbicide persistence, sulfonylureas herbicides