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Investigation of herbicide resistance in pigweed (*Amaranthus* sp.) to chloridazon, desmedipham and mixture of these herbicides in some sugar beet fields of Iran

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ABSTRACT

In order to study the possibility of resistance in *Amaranthus retroflexus* L. and *Amaranthus blitoides* S.Wats biotypes to Chloridazon, Desmedipham and mixture of these two herbicides in sugar beet fields of West Azarbayejan, Isfahan, Fars, Khorasan and Khoozestan provinces, two experiments were conducted at greenhouse of Weed Research Department of Iranian Research Institute of Plant Protection during 2003 and 2004. The experimental design was completely randomized design using a factorial approach (27 biotypes of pigweed by 3 herbicides in greenhouse experiments and 6 biotypes of pigweed by one herbicide in bioassay trial) with 4 replications. The seeds that were suspected to be resistant at the recommended rates of herbicides were collected from the fields of these provinces and the susceptible seeds that had never been treated with herbicides were used in these experiments. In the greenhouse experiment for screening the suspected and susceptible biotypes, the percent dry weight and visual control were compared with untreated control biotypes. Any biotype was considered to be possibly resistant if the mean dry weight of the survivors was at least 50% of the untreated control plants. Six biotypes with inadequate control from greenhouse trial were selected and treated with six doses (0, 0.5, 1, 1.5, 2, 2.5, 3 g/l) of Chloridazon in bioassay test using petri-dish. For assessment of biotypes the root length were measured. The greenhouse experiments indicated that none of the biotypes were resistant to these herbicides, but the biotypes showed different responses to the herbicides and

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the biotypes such as FR(Am)1 and MR(Am.bl)5 were not completely controlled by Chloridazon. The biotypes such as ER(Am)2 and MR(Am.re)1 were less controlled by Desmedipham and also biotypes such as ER(Am)1, ER(Am)3 and MR(Am.bl)6 were inadequately controlled by mixture of two herbicides. Although the biotypes did not show resistance to the herbicides, the repeated use of PS II herbicides can lead to the emergence of resistant weed population. Results in bioassay test showed that with increasing dose of Chloridazon, the percent root length of all biotypes was decreased and herbicide resistance did not observe.

Key words: Chloridazon (Pyramin), Desmedipham (Betanal AM), Herbicide resistance, PS II, *Amaranthus retroflexus* L. and *Amaranthus blitoides* S.Wats.

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