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Evaluation of the Effects of the Fallow / Forage-Barley and Sugarbeet / Forage-Barley Rotations on Density and Distribution of Weeds

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Abstract

In order to evaluate the effects of the pre-culture fallow or sugarbeet on density and distribution of different species of weeds in a forage-barley field, a study was executed at the Mashhad Experimental Station of the Ferdowsi University in 2003. Rotations of fallow / forage-barley and sugarbeet / forage-barley are conventional management systems. Samples were taken from the corners of the 7m*7 m grids using 0.5m*0.5 m size quadrates at three development stages (pre-application of herbicide, post-application of herbicide and pre-harvesting).

The results indicated that the density of annual weeds in the sugarbeet / barley rotation was higher than in the fallow / barley rotation. However, the density of perennial weeds was higher in the fallow / barley rotation than in the sugarbeet / barley rotation. Mapping of the species distribution and their density confirmed the patchiness of the weed distribution. The shape and size of the patches differed between field and weed species, but spatial distribution did not change considerably before and after application of herbicide. Percentage of free weed areas was 11.5% and 1.5% in fallow / barley rotation and 0.6% and 0% in sugarbeet / barley rotation in first and second sampling stage respectively. These results indicate the inefficacy of sugarbeet as pre-culture as compared to fallow with regard to weed density in a forage-barley field.

The evaluation of crop rotation management practices with special attention to weed dispersal within the field, is able to identify appropriate management strategies of high efficacy and profit for the farmer as well as to reduce crop damage.

Keywords: Forage barley, patchiness distribution, site specific management, weed management, crop rotation