

Effects of site-specific and conventional herbicide application on spatial and temporal variability of *Cardaria draba* (L.) population.

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Abstract: Intensive field surveys of *Cardaria draba* were conducted in two growing seasons (2005-2006) at two saffron (*Crocus sativus* L.) fields (field a: broadcast treatment and field b: patchy treatment), located in Boshrooyeh (33 North latitude, 57 East longitude), Razavi Khorasan, Iran. Geostatistical techniques were used to characterize the spatial and temporal variability of *C. draba* density and results were used to design precise herbicide application. The density and spatial distribution of *C. draba* varied with year and fields. The *C. draba* density maps calculated by kriging and was employed to estimate the percentage of surface susceptible to be treated with a site-specific herbicide treatment based on a weed threshold value of 13 shoot m⁻². Before herbicides application, in two years, *C. draba* density data showed moderate spatial dependence at both fields (47.6%-72.6%). Weed control was higher using broadcast than patchy application of herbicide in both years. In patchy control method, herbicide application was reduced by 42 and 26 percent compared to broadcast method in 2005 and 2006, respectively. In patchy herbicide method, the area exceeding the economic threshold was increased from 58 in 2005 to 74 percent in 2006, however under broadcast application treatment it was increased from 34 percent in 2005 to 67 percent in 2006. This indicated the lower weeds population increase under patch method (16%) compared to broadcast method (33%). Our results showed that the efficacy of weed control was higher in patchy than broadcast herbicide application method.