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Abstracts

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Prediction spatial distribution patterns of *Cardaria draba* (L.) using learning vector quantization artificial neural network (LVQANN)

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Recent advances in precision farming technologies have triggered the need for highly flexible modelling methods to estimate, classify and map weed population patterns for using in site-specific weed management. In this research, a learning vector quantization neural network (LVQNN) model was developed to predict and classify the spatial distribution of *Cardaria draba* (L.) density. This method was evaluated on data of *C. draba* (L.) density in a wheat field located in Boshrooyeh, Southern Khorasan, Iran, in 2010. Some statistical tests, such as comparisons of the means, variance, statistical distribution were used between the observed point sample data and the estimated weed density surfaces to evaluate the performance of the pattern recognition method. Results showed that in training LVQNN, test and total phase P-value was greater than 0.9, indicating that there was no significant difference between statistical parameters such as average, variance, statistical distribution in the observed and the estimated weed density. This results suggest that LVQNN can learn weed density model very well. In addition, results indicated that trained LVQNN has a high capability in predicting weed density with recognition accuracy of 100 percent at unsampled points. The technique showed that the LVQNN could classify and map *C. draba* (L.) spatial variability on the field. Our map showed that patchy weed distribution offers large potential for using site-specific weed control on this field.

Keywords
Classification, Map, Learning vector quantization, Neural network, Patchy distribution