



Artificial neural networks reveal efficiency in genetic value prediction

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ABSTRACT. The objective of this study was to evaluate the efficiency of artificial neural networks (ANNs) for predicting genetic value in experiments carried out in randomized blocks. Sixteen scenarios were simulated with different values of heritability (10, 20, 30, and 40%), coefficient of variation (5 and 10%), and the number of genotypes per block (150 and 200 for validation, and 5000 for neural network training). One hundred validation populations were used in each scenario. Accuracy of ANNs was evaluated by comparing the correlation of network value with genetic value, and of phenotypic value with genetic value. Neural networks were efficient in predicting genetic value with a 0.64 to 10.3% gain compared to the phenotypic value, regardless the simulated population size, heritability, or coefficient of variation. Thus, the artificial neural network is a promising technique for predicting genetic value in balanced experiments.

Key words: Backpropagation; Heritability; Testing; Programming; Improvement