

# Detection of toxic and non-toxic sweet cherries at different degrees of maturity using an electronic nose

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## Abstract

Diazinon is the most important pesticide of sweet cherry and one possible tactic to detect its residues is sensing the aromatic volatiles released by fruit with using electronic-nose. Electronic-nose (e-nose) machines are designed to detect the diazinon residue in sweet cherries. It was equipped with ten sensors (MOS type), that each of them reacts to specific volatile compounds in the samples. The mathematical method to analyze the results in this paper are artificial neural networks (ANN), principal components analysis (PCA) and linear discriminant analysis (LDA). PCA analysis characterized 90–96% of the variance in data for toxic and non-toxic sweet cherries in four ripeness grades (RGs). The best structure (10–4–2) can classify the samples in two classes (toxic and non-toxic) in ANN analysis with a precision of 100%. The accuracy of the LDA analysis for detection diazinon residue was 97%. Sensors TGS813, RGS822, TGS2602, and MQ3 showed the best response for detection of diazinon.