

Contamination of organic produce by synthetic pesticides: Organic wine as a case study

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Introduction

The occurrence of pesticide residues has become a major concern in quality assurance in organic production. The introduction of more sensitive analytical methods revealed, for example, that higher numbers of organic wines contained minute amounts of pesticides which are not allowed in organic agriculture. Organic farmers are often suspected of fraud if residues are detected, independent of the concentration level. In order to support organic wine-growers in their effort to improve the situation, critical control points for fungicide occurrence from the grape to the wine were defined and a broadspectrum analysis campaign was carried out to define possible background contamination.

Material and methods

In the first study, 5 vineyards and cellars were considered with different levels of risk contamination. Samples were taken from the border row of the organically treated lot and, when possible, the adjacent conventionally treated. During vinification of the organic wine, further samples were taken at critical control points such as pressing, passage among tanks, filtration or bottling. In the second study, 194 organically and conventionally grown wines (Switzerland and abroad) sold in Switzerland were sampled and analysed for 13 commonly used conventional fungicides.

Results and discussion

Contamination by spray-drift has been overestimated although extreme situations such as helicopter application caused wide-spread drift in high concentration. Problems were revealed in wine-cellars with parallel processing of both organically and conventionally grown grapes. Improvements could be achieved by i) processing organic grapes/wine before conventional wine, ii) careful rinsing of all equipment, iii) changing of filter layers before processing of organic wines etc. Organically grown wines in Switzerland showed tremendously less fungicide residues (from not detectable up to 0.01 mg/kg) than conventionally grown wines (not detectable to 0.45 mg/kg). In addition, background contamination was found to depend on the region of cultivation. Red wines were generally higher contaminated than white wines.

Conclusion

Background contamination is a fact and might only be reduced by banning of fungicides used in conventional farming. Organic wines might also have traces of fungicides in the future. The goal of minimal pesticide residues in organic wine can be reached by improved quality assurance and taking necessary steps in HACCP. The introduction of our technical leaflet with specific quality measures should help to reach this goal. Findings from the studies must be incorporated in the quality assurance and the inspection procedures of the cellars.

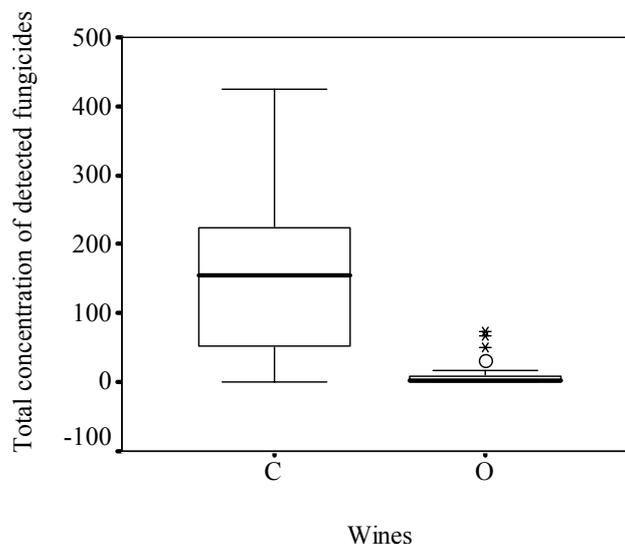


Fig. 1: Fungicide residues in organic and conventional wine. C=conventional; O=organically grown wine. Thin line indicate median. Outliers for O-wine.