

O44. A Grey Water Footprint assessment for pesticides applied in soils with grape cultivation in Mendoza (Argentina)

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The growing risk of diffuse contamination of surface waters by agrochemicals has increased interest in quantifying environmental impacts on water sources. The indicator used to evaluate these impacts is the Grey Water Footprint (GWF), which measures the amount of water necessary to assimilate a pollutant load produced from anthropic activity. In viticulture, for example, the estimation of the GWF can be employed for assessing the environmental impacts related to the use of pesticides. In the framework of the *Institutional Analysis of Water Management in Mendoza* project, the GWF for a wide range of pesticides commonly applied in grape cultivation in the Fifth Irrigation Zone of Mendoza River were estimated. To do this, we used information on (1) trade data about phytosanitary products for the period 2018-2021, (2) surface with grape cultivation specifying the conduction system of the vine (“parral” or vineyard), and (3) crop yield. The spatial heterogeneity of the input data was performed at the district scale. For estimation of the GWF, chemical properties of each pesticide (K_{oc} and half-life in days), environmental factors (texture and organic matter content of soil, rain intensity and precipitation) and management practices in grape cultivation were taken into account. The results show that the total annual average of pesticides load entering a water body from soils with grape cultivation (14,496 ha) during the 2018-2021 period was 0.37 t year⁻¹. The pesticide load was higher in crops with a conduction system of the vine through “parral” with 56.24% of the total pesticide load. The most critical chemical substance in the range of pesticides commonly applied to soils with grape cultivation was *Fluroxypyr-meptyl*, requiring 196 million m³ year⁻¹ of water to assimilate the pollutant load entering a water body. In general, diluting pesticide laden in a water body requires relatively more water when conduction system of the vine is through “parral” compared to conduction system through vineyards. At the district level, the findings report a large diversity of GWF among different phytosanitary products, indicating the importance of considering all of them when seeking to protect surface waters and ground water based on a GWF assessment. These results may be of particular use for stakeholders interested in making the viticulture more sustainable.

Palabras clave: grey water footprint, viticulture, pesticides, water sources.

Área temática: Pollution indicators: populations and communities.