



Fate and distribution of some persistent organochlorine compounds in horticultural soils located in Southeast of Spain

J. Bech (1), C. Pérez-Sirvent (2), M.J. Martínez-Sánchez (2), A. Barba (2), J. Oliva (2) and J. Vidal-Otón (2)

(1) Chair of Soil Science (Plant Biology), University of Barcelona, 08038 Barcelona, Spain (jbech@ub.edu) (2) Department of Agricultural Chemistry, Geology and Pedology, Faculty of Chemistry, University of Murcia, Campus de Espinardo, 30100, Murcia, Spain, (melita@um.es)

The spatial-temporal distribution of the residues of two organochlorine compounds, namely endosulfan sulfate (the metabolite of α and β endosulfan, a pesticide widely used in the study area) and dieldrin (a persistent pesticide banned in the 1970's) has been studied. The study has been carried out in traditionally irrigated soils growing citrus and various horticultural products in the Vega Baja del Segura (Murcia, SE Spain).

The sampling design consisted of five transects with respect to the Azarbe Mayor and Segura river in an area of Calcaric Fluvisols and covering 60 Km². Samples were taken of the arable layer (0-25cm) at five different times (1993-1996-1999-2002 and 2005).

The organochlorine compounds were extracted with acetonitrile using a micro-extraction method on-line with homogenization by means of an ultrasonic disintegrator, and subsequent recovery of the organic phase with phase separating filter paper (1 PS). The phase was dried in a vacuum rotary evaporator and the extract was then redissolved in a 1:1 isooctane-toluene mixture. The final determination was carried out by GC with a fused-silica column (30m x 0.32mm and 0.25 μ m), an ECD device being used for detection.

Using the data obtained and the sampling point coordinates, a Geographical Information System (GIS) was applied to provide the pesticide isoconcentration lines of the

diagrams. The results showed the variations in the distribution of the two compounds studied at five different times and any accumulation of the same. For the sampling points location on the ground we used a Global Positioning System (GPS) was used, the data obtained being exported to a *cad* system (Autocad). The isoconcentration lines were obtained by using a suitable software (Surfer ver. 6.04).

The results indicated that endosulfan was widely distributed over the whole study zone due to the frequent use of α and β endosulfan, of which it is a metabolite. The wide distribution of dieldrin was also of note, especially as its use was forbidden many years ago. The explanation would either be to its unsuitable use or to the transformation of other products of the same family which were used at the time.