Electronic Supplementary Material (ESI) for Analytical Methods.

SUPPLEMENTARY INFORMATION

Simple and rapid analytical methodology based on liquid chromatography-tandem mass spectrometry for monitoring pesticide residues in soils from Argentina

Eduardo De Gerónimo[1*], Ana María Botero-Coy[2], José M. Marín[2], Virginia C. Aparicio[1], José L. Costa[1], Juan V. Sancho[2], Félix Hernández*[2]

[1]Instituto Nacional de Tecnología Agropecuaria (INTA), Estación Experimental Agropecuaria Balcarce, Route 226 Km 73,5 (7620), Balcarce, Buenos Aires, Argentina.

[2] Research Institute for Pesticides and Water, University Jaume I, 12071 Castellon, Spain

S.I. Table 1. Physico-chemical properties of the model soils used in this study, collected from different areas of Argentina

Nº Lab.	EEA INTA	Nº	C.E.C. Cmol/kg (2)	Sand	Silt (%) (1)	Clay	(OM) (3)	pH (3)
66298	Marco Juarez	1	32.9	12.9	53.4	33.7	4.7	6.4
66279	Sgo del Estero	2	19.9	21.3	54.9	23.8	4.5	7.3
66282	Famailla	3	38.3	8.5	57.1	34.4	8.5	6.5
66283	Pergamino	4	16.5	19.9	53.5	26.6	2.7	6.1
66512	Cerro Azul	5	27.3	5.7	24.8	69.5	6.0	5.7
63727	Balcarce	6	37.4	43.8	26.9	29.3	10.3	6.3
66514	Alto Valle	7	26.2	43.1	35.6	21.2	2.7	7.5
66515	Corrientes	8	9.0	90.3	3.3	6.4	0.5	6.0
67685	Chaco	9	23.5	13.5	49.0	37.5	4.0	6.7
67916	Reconquista	10	19.0	24.9	50.4	24.7	5.1	6.0
66295	Cerro amigo	11	30.0	38.1	32.5	29.4	6.9	6.4
67775	Barrow	12	40.5	29.7	33.2	37.1	7.3	6.9

OM: organic matter
CEC: cation exchange capacity

(1) Gee, G.W., Bauder, J.W., 1986. Particle size analysis. In: Methods of Soil Analysis. Part 1. Methods Phys. Minerol. Second Edi.

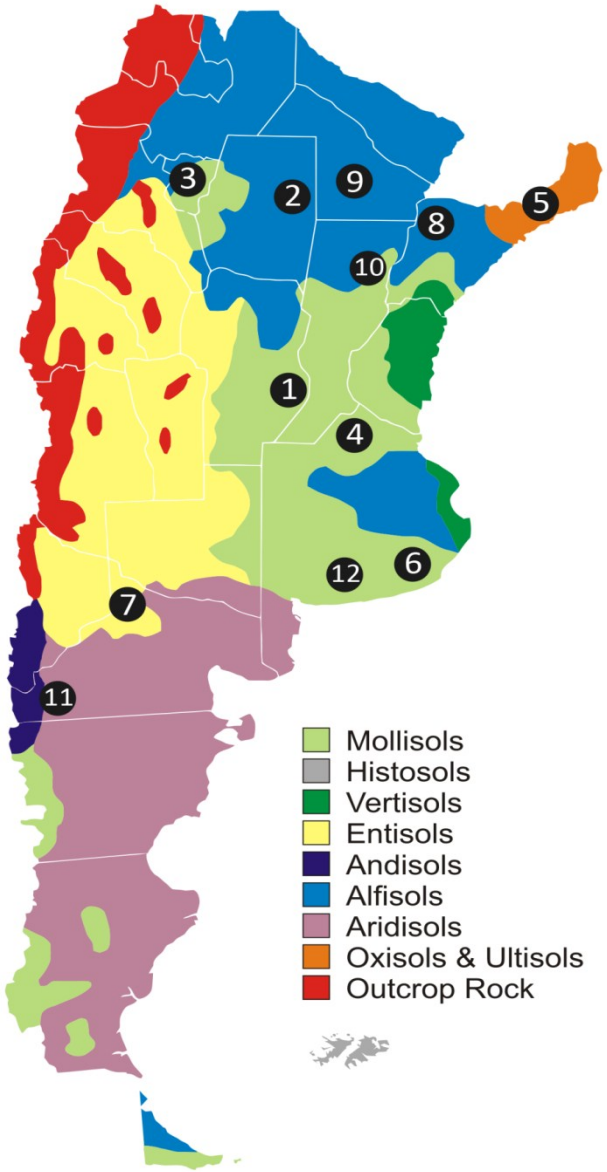
(2) Chapman, H.D., 1965. Cation exchange capacity. In: Methods of Soils Analysis. Am. Soc. Agron. Second Ed., 891 – 901.

(3) Nelson, D.W., Sommers, L.E., 1982. Total carbon, organic carbon and organic matter. Am. Soc. Agron. 9, 539 – 579.

S.I. Table 2. Pesticide concentrations (mg/kg) in the soils analyzed

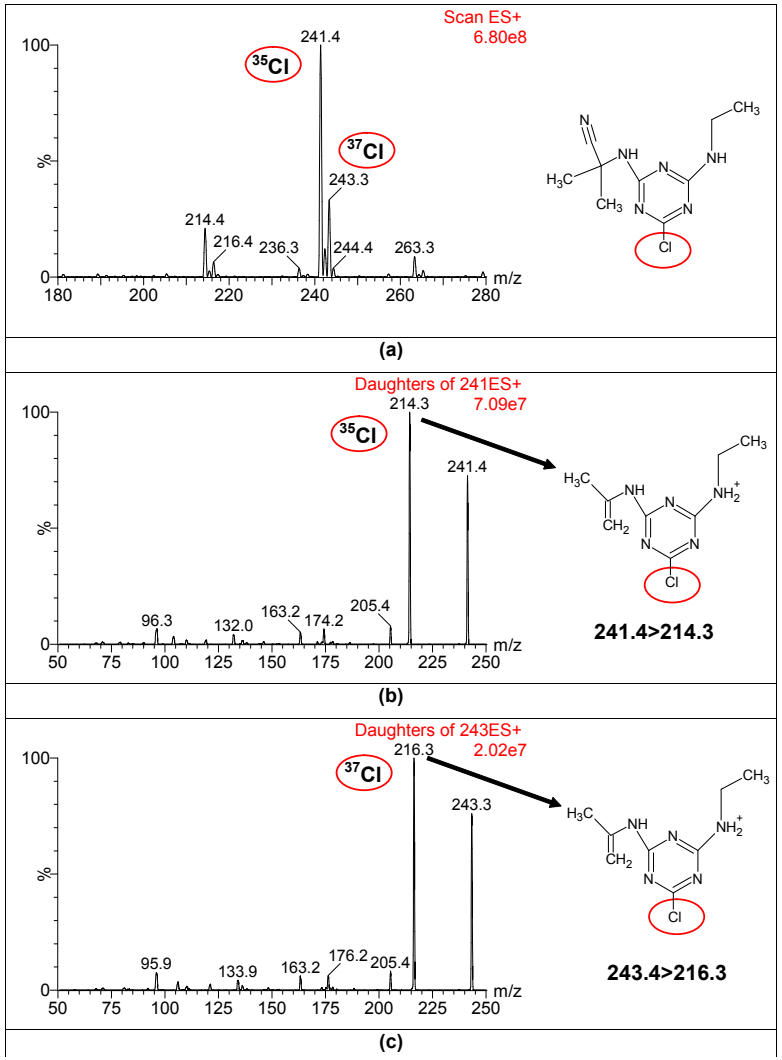
Soil / Compound	Cerro Azul	Alto Valle	S del Estero	Corrientes	Cerro Amigo	Pergamino	Reconquista	Barow
Chlorpyrifos (CHLOR)	0.02*			0.004*				
Imidacloprid (IMI)						0.02*		**0.07**
Dimethoate (DIM)						0.03*	**0.06**	
Ametryn (AME)			0.03*			**0.09**		
Atrazine (ATZ)		0.02*			0.01*		**0.06**	**0.07**

**: estimated concentration from a response that was above S/N=10 (but below the LOQ objective of 0.05 mg/kg).*

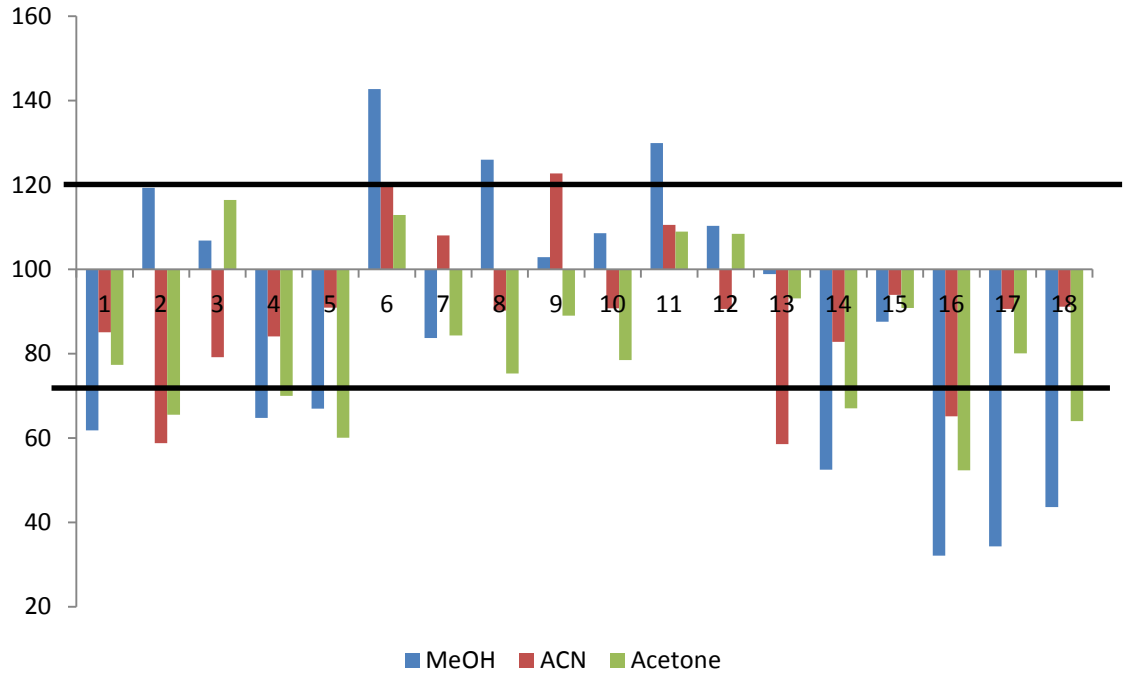


Name of Soil	Zone
Marco Juarez	1
Sgo del Estero	2
Famaillá	3
Pergamino	4
Cerro Azul	5
Balcarce	6
Alto Valle	7
Corrientes	8
Chaco	9
Reconquista	10
Cerro amigo	11
Barrow	12

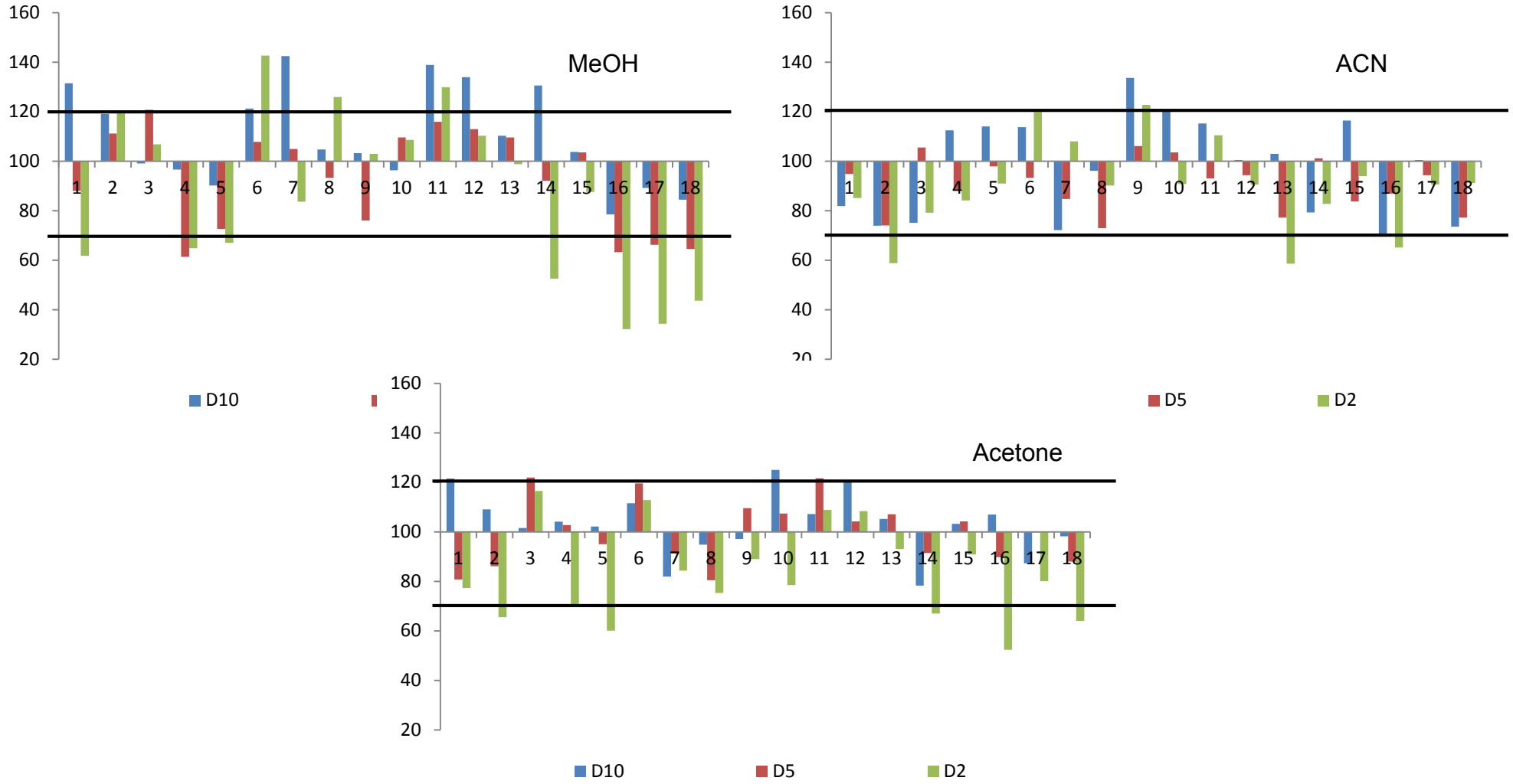
S.I. Figure 1. Location of areas where soil samples were collected



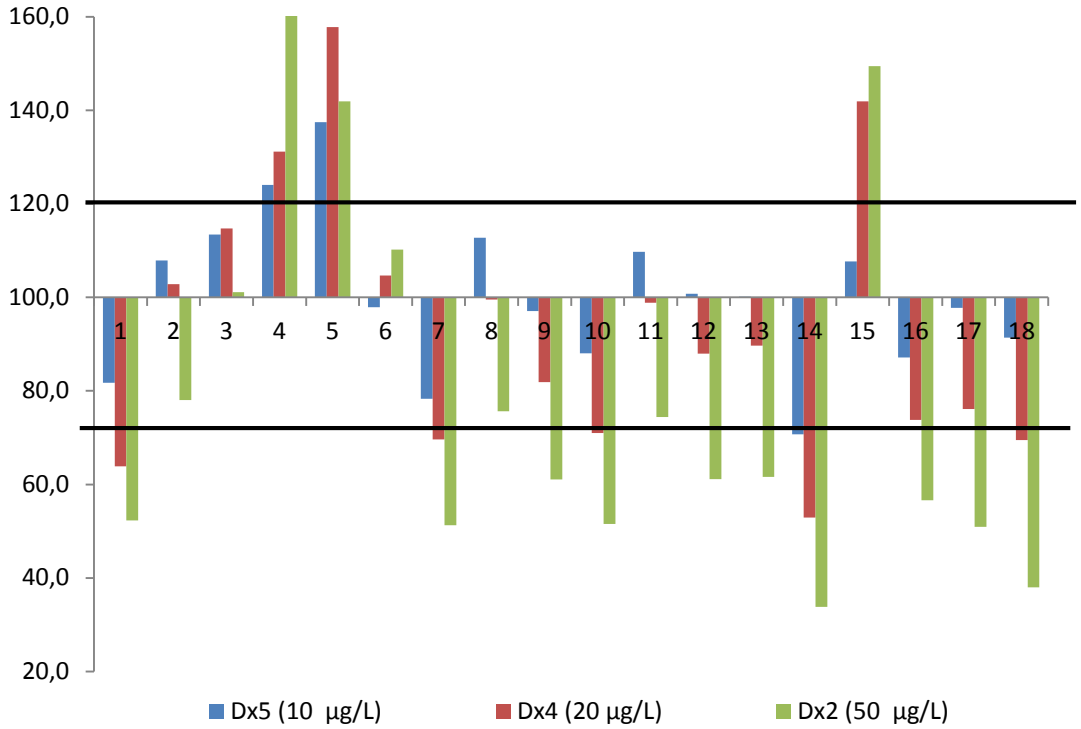
S.I. Figure 2. Example of the use of the chlorine isotopic pattern to obtain MRM transitions. (a) Cyanazine MS spectrum acquired at a cone voltage of 30 V; (b) Cyanazine MS/MS spectrum for precursor ion m/z 241 and (c) for precursor ion m/z 243 both at a collision energy of 15 eV.



S.I. Figure 3. Matrix effects for different extraction systems (dilution x 2) (50 μg/L in soil extract). The name of pesticides corresponding to the different numbers can be found in Table 1



S.I. Figure 4. Matrix effects for the extraction systems tested, after diluting soil sample extracts with water. The name of pesticides corresponding to the different numbers can be found in Table 1



S.I. Figure 5. Matrix effects after application of QuEChERS and subsequent dilution of the soil extract with water. The name of pesticides corresponding to the different numbers can be found in Table 1