CSIC

Consejo Superior de
Investigaciones Científicas

# INSTITUTO DE RECURSOS NATURALES Y AGROBIOLOGÍA DE SEVILLA

# MEMORIA 1998

# *Presentación*

La presente Memoria pretende reflejar, de una forma resumida, la actividad científica desarrollada en el Instituto de Recursos Naturales y Agrobiología de Sevilla (IRNAS) a lo largo de 1998, así como las relaciones que estas actividades han originado con los entornos regional, nacional e internacional.

El IRNAS ha proseguido durante este año con su actividad investigadora, cifrándose en 53 proyectos de los que un 38% corresponden a Programas Nacionales (CICYT), 22% a la Unión Europea, 28% a la Junta de Andalucía y 12% a empresas privadas y otras actividades. Los resultados obtenidos se han plasmado en publicaciones internacionales (80%) y nacionales, informes, memorias, etc. (20%).

Durante este año y como consecuencia de acuerdos entre el CSIC y la Agencia Europea de Medioambiente (EEA), se asignó al IRNAS la sede de la Dirección del Centro Europeo Temático de Suelos (ETCS) para cuyo puesto fue designado el investigador de nuestro Instituto, Prof. Diego de la Rosa, por lo que todos nos congratulamos.

También hemos de felicitar al Dr. José Manuel Murillo por su promoción a Investigador Científico y dar la bienvenida a Dª. Luisa Candau Lancha, D. Martín Romero Márquez y Dª. Carmen Martín González, por su incorporación al IRNAS como Auxiliar Administrativo y Ayudantes de Investigación, respectivamente. Asimismo, ha sido promocionado D. Manuel Sánchez García de Mozo a Oficial de Mantenimiento.

Desgraciadamente, no todo en este año han sido alegrías, ya que hemos sufrido la pérdida irreparable de Eduardo Gómez Asensio, Ayudante de Investigación, gran profesional y mejor persona, que aunque en su última etapa de actividad, se trasladó al Instituto de Ciencia de Materiales de Sevilla, nosotros siempre lo consideramos de nuestra casa, donde se formó y desarrolló una magnífica labor en todos los laboratorios por los que pasó.

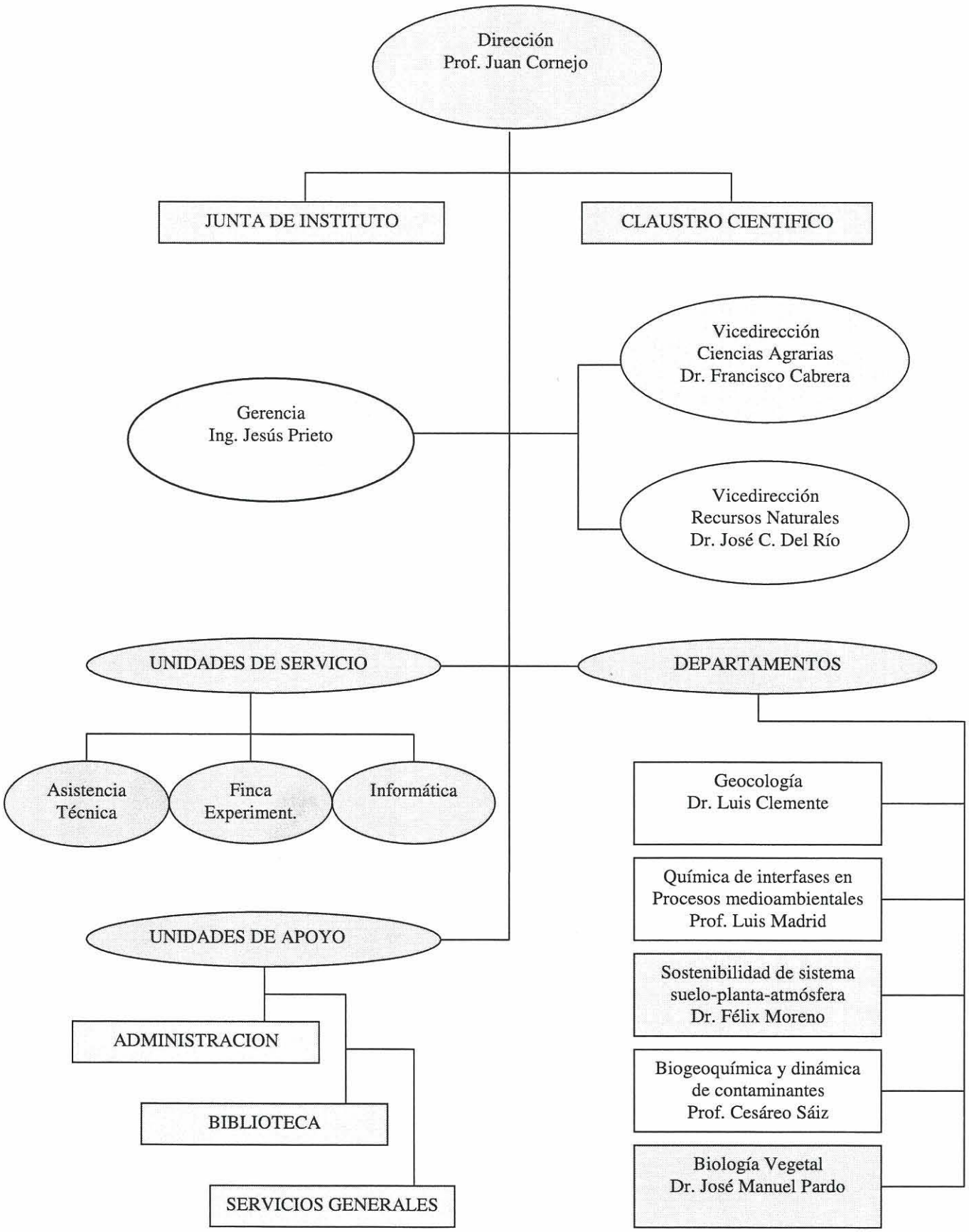
Finalmente, repasando todos los aspectos que contiene esta Memoria, superando las dificultades del día a día, entre todos, se ve con cierto optimismo el futuro del IRNAS, si bien el capítulo de recursos humanos sigue siendo un aspecto, que aunque ha mejorado, no está bien adecuado a las necesidades inmediatas.

*El Director*
*Juan Cornejo*

# *Indice General*

# 1. INTRODUCCION

# INST. DE RECURSOS NATURALES Y AGROBIOLOGIA DE SEVILLA



# 2. PROYECTOS DE INVESTIGACION

# 2.1. Departamento de Geoecología

## Study of alternatives for net location and/or identificatios technical controls devices (contronet)

**Fuente:** DGXIV, Politica Pesquera Comunitaria (Unión Europea)
**Cod-CSIC:** 0199/PCP
**Cod-fuente:** 95/C 76/15
**Fecha Inicio:** 01/03/1996 **Fecha Finalización:** 01/05/1998
**Asignacion:** 1.363.150 Pts
**Investigador principal:** Patricia Siljestrom Ribed
**Investigadores IRNAS:** Juan S. Cara Garcia
**Otros investigadores:** Gregorio de Metrio (Univ. de Bari),Esgemar, SA, Rafael Carbo (Inst. Acustica-CSIC); Klas Vikgren (MMT)

## Sonar technology for monitoring and assessment of benthic communities (biosonar)

**Fuente:** (Unión Europea)
**Cod-CSIC:** 0102/GG
**Cod-fuente:** MAS3-CT95-0026
**Fecha Inicio:** 01/03/1996 **Fecha Finalización:** 01/03/1999
**Asignacion:** 29.411 Euro
**Investigador principal:** Patricia Siljestrom
**Investigadores IRNAS:** Adela Moreno Lopez, Luis V. Garcia Fernandez, Luis Clemente
**Otros investigadores:** VKI,IMM (Dinamarca); MMT (Suecia); Esgemar, SA

## Biodiversidad del bosque mediterráneo: una comparación entre el sur de España y el norte de Marruecos

**Fuente:** D.G.I.C.Y.T. (C.I.C.Y.T.)
**Cod-CSIC:**
**Cod-fuente:** PB97-1177
**Fecha Inicio:** 01/10/1998 **Fecha Finalización:** 01/10/2001
**Asignacion:** 1.800.000 Pts
**Investigador principal:** Teodoro Marañón
**Investigadores IRNAS:** Luis V. García, Redouan Ajbilou
**Otros investigadores:**

## Análisis de los procesos determinantes de la diversidad vegetal en brezales mediterráneos

**Fuente:** D.G.I.C.Y.T. (C.I.C.Y.T.)
**Cod-CSIC:**
**Cod-fuente:** PB95-0551
**Fecha Inicio:** 11/09/1996 **Fecha Finalización:** 11/09/1999
**Asignacion:** 1.000.000 Pts
**Investigador principal:** Juan Arroyo (Univ. Sevilla)
**Investigadores IRNAS:** Teodoro Marañón, José María Romero
**Otros investigadores:** J.A. Mejías y A. Aparicio (Univ. Sevilla)

## Ecología y evolución de plantas mediterráneas

**Fuente:** Plan Andaluz de Investigación (P.A.I.) (Junta de Andalucía)
**Cod-CSIC:**
**Cod-fuente:** RNM210
**Fecha Inicio:** **Fecha Finalización:**
**Asignacion:** 765.000 Pts
**Investigador principal:** Juan Arroyo (Univ. Sevilla)
**Investigadores IRNAS:** Teodoro Marañón, J.M. Romero
**Otros investigadores:** J.A.Mejías, A. Aparicio (Univ. Sevilla)

## Aplicacion de sensores remotos al estudio de sistemas naturales

**Fuente:** Plan Andaluz de Investigación (P.A.I.) (Junta de Andalucía)
**Cod-CSIC:**
**Cod-fuente:** RNM123
**Fecha Inicio:** 01/01/1989 **Fecha Finalización:**
**Asignacion:** 1.076.000 Pts
**Investigador principal:** Luis Clemente Salas
**Investigadores IRNAS:** Jose Luis Mudarra, Patricia Siljestrom, Luis V. Garcia, Adela Moreno, Juan Cara, Antonio Rodriguez, Jose M. Alegre
**Otros investigadores:**

## Estudio del medio físico de Islas Chafarinas

**Fuente:** (Ministerio de Medio Ambiente)
**Cod-CSIC:**
**Cod-fuente:**
**Fecha Inicio:** 01/01/1997 **Fecha Finalización:** 31/07/1998
**Asignacion:** 1.550.000 Pts
**Investigador principal:** Luis Clemente Salas
**Investigadores IRNAS:** Luis V. García; Teodoro Marañón; Juan Cara; Carmen Martín; Jose Mª Alegre.
**Otros investigadores:** Joaquín Rodríguez, Luis Cáceres y Francisco Alonso (Univ. Huelva); Fernando Ojeda (Univ. Sevilla)

## Evolución geoambiental de la región suratlántica durante el Cuaternario reciente

**Fuente:** (C.I.C.Y.T.)
**Cod-CSIC:**
**Cod-fuente:**
**Fecha Inicio:** 01/01/1996 **Fecha Finalización:** 31/12/1998
**Asignacion:** 2.000.000 Pts
**Investigador principal:** Joaquín Rodríguez Vidal
**Investigadores IRNAS:** Luis Clemente Salas; Antonio Rodríguez Ramírez
**Otros investigadores:** Luis Cáceres (Univ. de Huelva) y José R. de Andrés (ITGE)

## 2.2. Departamento de Química de Interfases en Procesos Medioambientales

### Estudio de calidad de la señal de la red electrica, su medida y control.

**Fuente:** (C.I.C.Y.T.)
**Cod-CSIC:**
**Cod-fuente:** TIC97-1221-CO2-01
**Fecha Inicio:** 01/08/1997 **Fecha Finalización:** 31/07/1999
**Asignacion:**
**Investigador principal:** Juan Carlos Montaño Asquerino
**Investigadores IRNAS:**
**Otros investigadores:** Antonio Lopez Ojeda, Manuel Castilla Ibañez, Jaime Gutierrez Benitez

### Disminución de la contaminación de plaguicidas en suelos mediante su encapsulación molecular con ciclodextrinas

**Fuente:** (C.I.C.Y.T.)
**Cod-CSIC:**
**Cod-fuente:**
**Fecha Inicio:** 01/07/1995 **Fecha Finalización:** 30/06/1998
**Asignacion:** 1.265.000 Pts
**Investigador principal:** E. Morillo
**Investigadores IRNAS:** C. Maqueda, T. Undabeytia
**Otros investigadores:** P. Rodríguez-Rubio, J.M. Ginés

### Influencia mutua de plaguicidas y metales pesados en su movilidad en el sistema suelo-agua y efecto de la adición de residuos urbanos.

**Fuente:** (C.I.C.Y.T.)
**Cod-CSIC:**
**Cod-fuente:**
**Fecha Inicio:** 01/09/1997 **Fecha Finalización:** 31/08/2000
**Asignacion:** 2.415.000 Pts
**Investigador principal:** C. Maqueda
**Investigadores IRNAS:** E. Morillo, E. Diaz-Barrientos, L. Madrid
**Otros investigadores:** P. Rodríguez-Rubio, J.L. Ruiz

## Contaminantes Orgánicos e Inorgánicos en el Medio Ambiente

**Fuente:** Plan Andaluz de Investigación (P.A.I.) (Junta de Andalucía)
**Cod-CSIC:**
**Cod-fuente:**
**Fecha Inicio:** 01/01/1993 **Fecha Finalización:**
**Asignacion:** 1.061.386 Pts
**Investigador principal:** C. Maqueda
**Investigadores IRNAS:** E. Morillo, T. Undabeytia
**Otros investigadores:**

## Alteraciones en la retención, transporte y distribución de metales en suelos por el uso de sustancias orgánicas.

**Fuente:** (C.I.C.Y.T.)
**Cod-CSIC:**
**Cod-fuente:** aMB98-0888
**Fecha Inicio:** 01/09/1998 **Fecha Finalización:** 01/09/2001
**Asignacion:** 2.254.000 Pts
**Investigador principal:** L. Madrid
**Investigadores IRNAS:** E. Díaz Barrientos, C. Maqueda, E. Morillo
**Otros investigadores:** M. Bejarano Bravo, R. Ruiz Contreras

## Química del suelo

**Fuente:** Plan Andaluz de Investigación (P.A.I.) (Junta de Andalucía)
**Cod-CSIC:**
**Cod-fuente:** RNM0164
**Fecha Inicio:** 01/01/1989 **Fecha Finalización:**
**Asignacion:**
**Investigador principal:** L. Madrid
**Investigadores IRNAS:** E. Díaz Barrientos
**Otros investigadores:** M. Bejarano Bravo

## 2.3. Departamento de Biogeoquímica y Dinámica de Contaminantes

### Deterioration of prehistoric rock art in karstic caves by mass tourism. Integrated study (environment, geology, geochemistry and microbiology) for their conservation

**Fuente:** (Unión Europea)
**Cod-CSIC:** 0214-FF
**Cod-fuente:** ENV4-CT95-0104
**Fecha Inicio:** 1/01/1996 **Fecha Finalización:** 31/12/1998
**Asignacion:** 6.888.000 Pts
**Investigador principal:** C. Saiz-Jimenez
**Investigadores IRNAS:** B. Hermosin, L. Laiz, I. Gonzalez, B. Caballero
**Otros investigadores:**

### Novel molecular tools for the analysis of unknown microbial communities of mural paintings and their implementation into the conservation/restoration practice

**Fuente:** (Unión Europea)
**Cod-CSIC:** 1333-FF
**Cod-fuente:** ENV4-CT98-0705
**Fecha Inicio:** 1/04/1998 **Fecha Finalización:** 1/04/2000
**Asignacion:** 15.806.670 Pts
**Investigador principal:** C. Saiz-Jimenez
**Investigadores IRNAS:** B. Hermosin, L. Laiz, I. Gonzalez, B. Caballero
**Otros investigadores:**

### Development of an innovative water-repellent/biocide surface treatment for mortars: assessment of their performance by using modern analytical tools and surface analysis

**Fuente:** (Unión Europea)
**Cod-CSIC:** 1145-FF
**Cod-fuente:** ENV4-CT98-0707
**Fecha Inicio:** 1/05/1998 **Fecha Finalización:** 30/04/2001
**Asignacion:** 13.827.600 Pts
**Investigador principal:** C. Saiz-Jimenez
**Investigadores IRNAS:** B. Hermosin, L Laiz, I. Gonzalez, B. Caballero
**Otros investigadores:**

## Inventory of bacteria associated to biodeterioration processes of the prehistoric paintings in Altamira cave using an integrated approach.

**Fuente:** Acciones Integradas (M.E.C.)
**Cod-CSIC:**
**Cod-fuente:**
**Fecha Inicio:** 1/01/1998 **Fecha Finalización:** 31/12/1999
**Asignacion:** Pts
**Investigador principal:** C. Saiz-Jimenez
**Investigadores IRNAS:** B. Hermosin
**Otros investigadores:**

## Wood extractives in pulp and paper manufacture:technical and environmental implications and biological removal

**Fuente:** (Unión Europea)
**Cod-CSIC:** 0026/II
**Cod-fuente:** FAIR CT95-0560
**Fecha Inicio:** 01/12/1995 **Fecha Finalización:** 31/05/1999
**Asignacion:** 9.300.000 Pts
**Investigador principal:** Francisco J. González Vila
**Investigadores IRNAS:** Ana Gutierrez Suárez, José C. del Rio Andrade, Francisco Martín Martínez
**Otros investigadores:**

## Arcillas, organoarcillas e hidrotalcitas como portadores de plaguicidas para minimizar su impacto ambiental

**Fuente:** (C.I.C.Y.T.)
**Cod-CSIC:**
**Cod-fuente:** AMB96-0445-CO2-01
**Fecha Inicio:** 01/09/1996 **Fecha Finalización:** 01/09/2001
**Asignacion:** 3.225.000 Pts
**Investigador principal:** M. Carmen Hermosin Gaviño
**Investigadores IRNAS:** M. Jose Carrizosa Vila, M. Jesús Calderón Reina, A. Martinez Durán
**Otros investigadores:** M.A.Ulibarri Cormenzana,C.Barriga Carrasco, J.M. Fernandez Rodriguez,I.Pavlovic (Unv.Cordoba),I.Roldán Morillo (EUITA, El Cuarto)

## Movilidad de plaguicidas en suelos: efecto de su interacción con asociaciones coloidales y de la adición de residuos orgánicos en la reducción de la contaminación de aguas superficiales y subterraneas

**Fuente:** (C.I.C.Y.T.)
**Cod-CSIC:**
**Cod-fuente:** AMB96-0445-02-02
**Fecha Inicio:** 01/09/1996 **Fecha Finalización:** 01/09/2001
**Asignacion:** 1.848.000 Pts
**Investigador principal:** Juan Cornejo Suero
**Investigadores IRNAS:** Rafael Celis Garcia, Lucia Cox Meana, J.Francisco Garcia Albelda

**Otros investigadores:** Isabel Roldán Morillo (EUITA El Cuarto)

## Quimica Ambiental

**Fuente:** (Junta de Andalucía)
**Cod-CSIC:**
**Cod-fuente:** PAI-RNM124
**Fecha Inicio:** 01/01/1992 **Fecha Finalización:** 31/12/2000
**Asignacion:** 1.000.000 Pts
**Investigador principal:** Juan Cornejo Suero
**Investigadores IRNAS:** M. Carmen Hermosin, Lucia Cox, Rafael Celis, M. José Carrizosa y M. Jesus Calderón
**Otros investigadores:** Isabel Roldan Morillo

## Estudio de la fotodegradación y adsorción de napropamida como potenciales vias de eliminación en medios naturales

**Fuente:** (M.E.C.)
**Cod-CSIC:** HF97-0084
**Cod-fuente:**
**Fecha Inicio:** 01/01/1998 **Fecha Finalización:** 31/12/1998
**Asignacion:** 280.000 Pts
**Investigador principal:** M. Carmen Hermosin Gaviño
**Investigadores IRNAS:** Juan Cornejo y Lucia Cox
**Otros investigadores:**

## Persistencia y movilidad de herbicidas de uso forestal

**Fuente:** (C.I.C.Y.T.)
**Cod-CSIC:** FO96-0016-C2-2
**Cod-fuente:**
**Fecha Inicio:** 01/01/1997 **Fecha Finalización:** 31/12/2001
**Asignacion:**
**Investigador principal:** Juan Cornejo Suero
**Investigadores IRNAS:** M. Carmen Hermosin, M. Jesús Calderón
**Otros investigadores:** J.L. Garcia Baudin (INIA, Madrid)

## Descripción de las formas de nitrógeno en la materia orgánica del suelo y en compost marcados con N-15 con vistas a mejorar el aprovechamiento de las reservas de nitrógeno inmovilizado

**Fuente:** (C.I.C.Y.T.)
**Cod-CSIC:**
**Cod-fuente:** PB95-0079
**Fecha Inicio:** 01/09/1996 **Fecha Finalización:** 01/09/1999
**Asignacion:** 700.000 Pts
**Investigador principal:** Francisco Javier González Vila
**Investigadores IRNAS:** José C. Del Rio Andrade, Francisco Martín Martínez

**Otros investigadores:**

## Materia orgánica de suelos, sedimentos y residuos

**Fuente:** Plan Andaluz de Investigación (P.A.I.) (Junta de Andalucía)
**Cod-CSIC:**
**Cod-fuente:** PAI-RNMO 167
**Fecha Inicio:** 01/01/1989 **Fecha Finalización:**
**Asignacion:** 900.000 Pts
**Investigador principal:** Francisco Martín Martínez
**Investigadores IRNAS:** Francisco J. González Vila, José C. Del Rio Andrade, Ana Gutierrez Suárez, Trinidad Verdejo Robles
**Otros investigadores:**

## Evaluation of bacterial strategies to promote bioavailability of hydrophobic pollutants for efficient bioremediation of contaminated soils

**Fuente:** (Unión Europea)
**Cod-CSIC:**
**Cod-fuente:** BIO4-CT97-2015
**Fecha Inicio:** 01/01/1997 **Fecha Finalización:** 01/01/2000
**Asignacion:** 10.485.000 Pts
**Investigador principal:** J.J. Ortega Calvo
**Investigadores IRNAS:** Mohammed Lahlou, Marta Garcia-Junco Clemente
**Otros investigadores:**

## Ayuda complementaria al proyecto europeo: Evaluation of bacterial strategies to promote bioavailability of hydrophobic pollutants for efficient bioremediation of contaminated soils

**Fuente:** (C.I.C.Y.T.)
**Cod-CSIC:**
**Cod-fuente:** BIO97-1960-CE
**Fecha Inicio:** 01/03/1998 **Fecha Finalización:** 01/07/1999
**Asignacion:** 8.900.000 Pts
**Investigador principal:** J.J Ortega
**Investigadores IRNAS:** M. Lahlou, M. García Junco-Clemente
**Otros investigadores:**

## 2.4. Departamento de Sostenibilidad del Sistema Suelo-Planta-Atmósfera

### Riego del olivar con aguas de lavado de aceitunas negras

**Fuente:** A.S.E.M.E.S.A. (Privado)
**Cod-CSIC:**
**Cod-fuente:**
**Fecha Inicio:** 01/01/1997 **Fecha Finalización:** 01/12/1998
**Asignacion:** 575.000 Pts
**Investigador principal:** J.M. Murillo
**Investigadores IRNAS:** R. López; F. Cabrera; J.E. Fernández; F. Moreno
**Otros investigadores:**

### Síntesis de sales básicas de Co y Zn y estudio del efecto terapeutico de estas sales en el tratamiento de infecciones parasitarias en animales y plantas.

**Fuente:** (C.S.I.C.)
**Cod-CSIC:** BG01298
**Cod-fuente:**
**Fecha Inicio:** 01/01/1998 **Fecha Finalización:** 31/12/1999
**Asignacion:**
**Investigador principal:** Pablo Arambarri
**Investigadores IRNAS:**
**Otros investigadores:** Oscar García, Magdalena Gálvez, Christo Balarew, Margarita Gabrashanska y Stefka Tepavitcharova.

### Estudio de la Contaminación por el Vertido de las Minas de Aznalcóllar en las Fincas de la Empresa Afrexport.

**Fuente:** (Privado)
**Cod-CSIC:**
**Cod-fuente:**
**Fecha Inicio:** 01/07/1998 **Fecha Finalización:** 31/12/1999
**Asignacion:** 1.790.000
**Investigador principal:** Pablo Arambarri
**Investigadores IRNAS:** Félix Moreno Lucas, Rafael López Núñez.
**Otros investigadores:**

## Sustratos orgánicos en cultivos de fresón y naranjo: valoración agronómica y medioambiental.

**Fuente:** (C.I.C.Y.T.)
**Cod-CSIC:**
**Cod-fuente:** AGF96-0914
**Fecha Inicio:** 01/07/1996 **Fecha Finalización:** 01/08/2000
**Asignacion:** 1.000.000 Pts
**Investigador principal:** Francisco Cabrera Capitán
**Investigadores IRNAS:** J.M. Murillo Carpio, Rafael López Núñez, Felix Moreno Lucas, Enrique Fernández Luque, Pilar Burgos Domenech
**Otros investigadores:** M. Roca Ramírez

## Utilización de Fertilizantes. Impacto ambiental

**Fuente:** Plan Andaluz de Investigación (P.A.I.) (Junta de Andalucía)
**Cod-CSIC:**
**Cod-fuente:** AGR 0108
**Fecha Inicio:** **Fecha Finalización:**
**Asignacion:** 3.475.000 Pts
**Investigador principal:** F. Cabrera
**Investigadores IRNAS:** J.M. Murillo, R. López, P. Martín Olmedo, M.J. Díaz Blanco, E. Madejón, F. Madrid
**Otros investigadores:**

## Infraestructura: Espectrofotómetro de emisión óptica por plasma acoplado inductivamente (ICP-OES)

**Fuente:** C.I.C.Y.T. (C.I.C.Y.T.)
**Cod-CSIC:**
**Cod-fuente:** AGF IN97-0402
**Fecha Inicio:** **Fecha Finalización:** 17/12/1998
**Asignacion:** 13.000.000 Pts
**Investigador principal:** F. Cabrera
**Investigadores IRNAS:**
**Otros investigadores:**

## Efectos del riego con cantidades limitadas de agua y agua de baja calidad sobre las propiedades del suelo y el desarrollo de los cultivos en las marismas de Lebrija (Sector B-XII).

**Fuente:** (C.I.C.Y.T.)
**Cod-CSIC:**
**Cod-fuente:** HID96-1292
**Fecha Inicio:** 01/07/1996 **Fecha Finalización:** 30/06/1999
**Asignacion:** 2.387.000 Pts
**Investigador principal:** Félix Moreno Lucas
**Investigadores IRNAS:** Pablo Arambarri Cazalis, Luis Clemente Salas, Luis G. Ventura

**Otros investigadores:** Rosario Vaz pardal

## Programme de recherche sur les lacs collinaire dans la zone semi-aride du pourtour méditerranéen-HYDROMED

**Fuente:** (Unión Europea)
**Cod-CSIC:** 0701/TK
**Cod-fuente:** IC18-CT96-0091
**Fecha Inicio:** 01/11/1996 **Fecha Finalización:** 31/10/2000
**Asignacion:** 2.880.000 Pts
**Investigador principal:** Félix Moreno Lucas
**Investigadores IRNAS:** Diego de la Rosa Acosta, José E. Fernández, Luque, Francisco Cabrera Capitán
**Otros investigadores:**

## Experiences with the impact of subsoil compaction on soil, crop growth and environment and ways to prevent subsoil compaction

**Fuente:** DG XII (Unión Europea)
**Cod-CSIC:**
**Cod-fuente:** FAIR5-CT97-3589
**Fecha Inicio:** 01/01/1998 **Fecha Finalización:** 31/12/2000
**Asignacion:** 3.000 Euro
**Investigador principal:** Félix Moreno Lucas
**Investigadores IRNAS:** Diego de la Rosa Acosta, José Enrique Fernández Luque
**Otros investigadores:**

## Aplicación de riego deficitario y riego con agua salina en el Sector B-XII (marismas de Lebrija): Efectos sobre el suelo y los cultivos

**Fuente:** Consejería de Agricultura y Pesca (Junta de Andalucía)
**Cod-CSIC:**
**Cod-fuente:** C-97-060
**Fecha Inicio:** 01/08/1997 **Fecha Finalización:** 31/10/1998
**Asignacion:** 1.200.000 Pts
**Investigador principal:** Félix Moreno Lucas
**Investigadores IRNAS:** Francisco Cabrera Capitán
**Otros investigadores:** Luis Andreu Cáceres, Antonio Delgado, Benito Bellido, José Romero

## Utilizacion de la medida directa de los flujos de savia en el olivo para la optimizacion de la fertirrigacion

**Fuente:** (C.I.C.Y.T.)
**Cod-CSIC:**
**Cod-fuente:** OLI96-2187
**Fecha Inicio:** 01/03/1997 **Fecha Finalización:** 01/03/1998
**Asignacion:** 2.461.000 Pts
**Investigador principal:** Fernandez, J.E.
**Investigadores IRNAS:** Moreno, F., Cabrera, F., Murillo, J.M. Troncoso, A.,Palo

**Otros investigadores:**

## Respuesta de árboles frutales al riego deficitario: utilización de indicadores biológicos para la optimización del riego

**Fuente:** (C.I.C.Y.T.)
**Cod-CSIC:**
**Cod-fuente:** HID96-1342-CO4-01
**Fecha Inicio:** 01/07/1996 **Fecha Finalización:** 01/07/2000
**Asignacion:** 1.325.000 Pts
**Investigador principal:** Fernandez, J.E.
**Investigadores IRNAS:** D. de la Rosa
**Otros investigadores:** F. Pelegrín

## 2.5. Departamento de Biología Vegetal

### Mejora genética del algodón upland para condiciones de estrés hídrico.

**Fuente:** (Junta de Andalucía)
**Cod-CSIC:**
**Cod-fuente:**
**Fecha Inicio:** 20/12/1995 **Fecha Finalización:** 20/12/1998
**Asignacion:** 744.000 Pts
**Investigador principal:** E.O. Leidi Montes
**Investigadores IRNAS:**
**Otros investigadores:**

### Control de la nutrición nitrogenada en el algodonero.

**Fuente:** (Privado)
**Cod-CSIC:**
**Cod-fuente:**
**Fecha Inicio:** 20/04/1998 **Fecha Finalización:** 20/10/1998
**Asignacion:** 500.000 Pts
**Investigador principal:** E.O. Leidi Montes
**Investigadores IRNAS:**
**Otros investigadores:**

### Obtención y evaluación de plantas de olivo tolerantes a la salinidad mediante empleo de métodos biotecnológicos.

**Fuente:** Proy. Estr. Movil. "Aceite de Oliva" (C.I.C.Y.T.)
**Cod-CSIC:**
**Cod-fuente:** OLI96-2149
**Fecha Inicio:** 01/03/1997 **Fecha Finalización:** 01/03/2000
**Asignacion:** 3.726.000 Pts
**Investigador principal:** Antonio Troncoso de Arce
**Investigadores IRNAS:** Rafael Sarmiento, Eduardo O. Leidi, Felix Moreno, José E. Fernández, Manuel Cantos, José Luis García, Juana Liñán, Mª Carmen Grande, Mª Carmen Villalón, Asunción de Castro
**Otros investigadores:** Hava Rapoport (IAS, Córdoba), Mª Angeles Revilla (Univ. Oviedo), Mª Jesús Cañal (Univ. Oviedo)

## Sunflower Oil for Industrial Applications -SOFIA-

**Fuente:** (Unión Europea)
**Cod-CSIC:** 1276/I
**Cod-fuente:** AIR3 CT94 2003
**Fecha Inicio:** 01/01/1995 **Fecha Finalización:** 01/12/2000
**Asignacion:** 3.544.854 Pts
**Investigador principal:** J. Jordano
**Investigadores IRNAS:** C. Almoguera, P. Prieto Dapena y R. Carranco
**Otros investigadores:** G. Hahne (IBMP/CNRS Strasbourg). N. Martini (Max Planck Inst. Cologne). W. Friedt (Univ. Giessen.Empresas:KWS Einbeck y Rustica Semences.

## Caracterización de secuencias reguladoras de genes expresados en semillas de girasol con posible uso en la mejora mediante ingeniería genética de esta cosecha.

**Fuente:** (Biotecnologia) (C.I.C.Y.T.)
**Cod-CSIC:**
**Cod-fuente:** BIO96 0474
**Fecha Inicio:** 01/11/1996 **Fecha Finalización:** 01/11/1999
**Asignacion:** 2.440.000 Pts
**Investigador principal:** J. Jordano
**Investigadores IRNAS:** C. Almoguera, P. Prieto Dapena, R. Carranco y A. Rojas.
**Otros investigadores:**

## Tolerancia al estres en plantas: bases moleculares

**Fuente:** (Junta de Andalucía)
**Cod-CSIC:**
**Cod-fuente:** CVI 148
**Fecha Inicio:** 01/01/1992 **Fecha Finalización:**
**Asignacion:** 918.548 Pts
**Investigador principal:** Juan Jordano
**Investigadores IRNAS:** J.M. Pardo, C. Almoguera, P. Prieto Dapena, R. Carranco, A. Rojas, I. Mendoza.
**Otros investigadores:**

## Influencia de la fertirrigación sobre el contenido de nutrientes en el suelo, desarrollo de la planta de olivo y el rendimiento y calidad de la cosecha.

**Fuente:** (Otros)
**Cod-CSIC:**
**Cod-fuente:** CAO98-004
**Fecha Inicio:** 01/01/1998 **Fecha Finalización:** 16/12/2001
**Asignacion:** 388.000 Pts
**Investigador principal:** Antonio Troncoso
**Investigadores IRNAS:** Félix Moreno, José Manuel Murillo, Francisco Cabrera, Rafael López, José Enrique Férnandez

**Otros investigadores:** Angel García-Ortíz (Estación Viticultura, Jaén), José Ordovás (EUITA Universidad de Sevilla), Mª Paz Suárez (EUITA El Cuarto), Elías Pascual López (EUITA Cortijo El Cuarto)

## Estudio de zonificación vitícola y Aplicación a la D.O. Montilla-Moriles, usando la variedad Pedro Ximénez como referencia.

**Fuente:** (Privado)
**Cod-CSIC:**
**Cod-fuente:** C-97-002
**Fecha Inicio:** 01/01/1997 **Fecha Finalización:** 31/12/1998
**Asignacion:** 2.034.000 Pts
**Investigador principal:** Antonio Troncoso
**Investigadores IRNAS:** Manuel Cantos
**Otros investigadores:** Pedro Pérez Juan (Consejo Regulador Montilla-Moriles), Fernando Pérez Camacho (ETSIA Córdoba) Guillermo Paneque Guerrero (Fac. Químicas. Universidad de Sevilla)

# 3. RESULTADOS DE INVESTIGACION

# 3.1. Publicaciones

## 3.1.1. Publicaciones en revistas y Libros

### Artículos en revistas internacionales (ARI)

**ARI**

J.C. Montaño y P. Salmerón

**"Instantaneous and Full Compensation in Three-Phase Systems"**

Revista: IEEE Trans. on Power Delivery

Editor: IEEE

Volumen: 13 ISSN: 0885-8977

Paginas: 1342 - 1347 Ciudad:

Incluido en SCI: Sí

**Resumen.-** The theory of electric power for single-phase or three-phase systems has been based on both the instantaneous value concept and the average value concept. On the basis of periodic conditions, the active and reactive power definitions can be identified and their averaged quantities calculated for comparing the two concepts. The authors have proposed a geometrical approach for defining the instantaneous active and reactive power in three-phase four-wire circuits. Two orthogonal voltage vectors have been considered as the suppliers of the active and reactive power components, which are transferred between source and load. Cases of balanced or unbalanced loads with sinusoidal or non-sinusoidal phase voltages were considered.

**ARI**

Ortega-Calvo, J.J., Saiz-Jimenez, C

**Effect of humic fractions and clay on the biodegradation of phenanthrene by a Pseudomonas fluorescens strain isolated from soil.**

Revista: Appl. Environ. Microbiol.

Editor:

Volumen: 64 ISSN:

Paginas: 3123 - 3126 Ciudad:

Incluido en SCI: Sí

**Resumen.-** The mineralization of phenanthrene in pure cultures of a *Pseudomonas* species, isolated from soil, was measured in the presence of soil humic fractions and montmorillonite. Humic acid and clay, either separately or in combination, shortened the acclimation phase. A higher mineralization rate was measured in treatments with humic acid at 100 • g/ml. Humic acid at 10 • g/ml stimulated the transformation only in the presence of 10 g/L clay. We suggest that sorption of phenanthrene to these soil components may result in a higher concentration of substrate in the vicinity of the bacterial cells and therefore may increase its bioavailability.

**ARI**

Trubetskoj, O.A., Trubetskaya, O.E., Afanasieva G.V., Reznikova, O.I., Hermosin, B., Saiz-Jimenez, C.

**Tandem size exclusion chromatography-polyacrylamide electrophoresis of humic acids.**

Revista: Z. Pflanzanernahr. Bodenk.

Editor:

Volumen: 161 ISSN:

Paginas: 619 - 625 Ciudad:

Incluido en SCI: Sí

**Resumen.-** Humic acids (HAs) from four soils were fractionated by size exclusion chromatography (SEC) on Sephadex G-75. Three fractions were obtained in all humic acids, collected and assayed by polyacrylamide gel electrophoresis (PAGE). The unfractionated HA from each soil was used as reference. Each chromatographic fraction formed one electrophoretic zone corresponding closely to one band of the reference sample with some admixture of the fractions preceding or following. The

results indicate that fractionation of HAs by tandem SEC-PAGE can be succesfully used for obtaining fractions of reduced polydispersity and different electrophoretic mobilities. Pyrolysis/Methylation-gas chromatography-mass spectrometry of the full size preparations of HA and fractions with exactly defined molecular size and electrophoretic mobility showed a different distribution in humic components, mainly lipids, lignin derivatives and N-containing compounds.

## ARI

J.M. Murillo, F. Moreno, F. Pelegrín, J.E. Fernández

**Responses of sunflower to traditional and conservation tillage under rainfed conditions in southern Spain**

Revista: Soil & Tillage Research
Editor: Elsevier Science B.V.
Volumen: 49 ISSN: 0167 - 1987
Paginas: 233 - 241 Ciudad: Amsterdam, Holanda
Incluido en SCI: Sí

**Resumen.-** Nitrogen (N) availability is one of the most crucial aspects of conservation tillage. Therefore, the advent of this system makes it advisable to study the nutritional responses of the crop, for given site-specific environments. We have studied for three years (1993, 1995 and 1997) the effects of a traditional tillage (TT) and a conservation, reduced tillage (CT) on the growth and nutrition of the sunflower crop, in a wheat (Triticum aestivum, L.) - sunflower (Helianthus annuus L.) rotation, established under rainfed agriculture in a sandy clay loam soil (Xerofluvent) of southern Spain. The TT method consisted mainly of the use of mouldboard ploughing, and CT was characterized by leaving the crop residues on soil surface as mulch, chiselling after wheat and disc harrowing after sunflower, before sowing wheat. Sunflower, the crop studied, was not fertilized. In both tillage treatments, seedlings (separated into shoots and roots) and plants at flowering were collected for analysis. Plant growth and yield were also determined. After harvesting in 1995 and 1997 soil samples were collected (0-5 and 5-30 cm depth) for oxidizable organic matter (OM) and available nutrients analysis. For the third crop, soil nitrate nitrogen (NO3-N) was determined (0-10 and 10-30 cm depth) before sowing and four times after sowing. The CT method usually increased OM and N, and other nutrient contents in the top soil (0-5 cm), in relation to TT. However, for the third crop, soil NO3-N at the seedling stage was similar in both treatments (within the range of 25-42 kg ha-1, 0-30 cm depth). Nevertheless, sunflower plants showed better early growth and higher N concentration in TT than in CT. Concentration and total content of NO3-N of both shoots and roots in the seedlings of the third sunflower crop were also greater in TT (more than 50% and 100% respectively). This seems to show that factors other than N-availability could affect the early plant nutrition and growth. These nutritional differences disappeared later (early flowering), except in the second sunflower crop (1995), which could not complete normal growth in the TT treatment due to the severe drought of that year. The lower early growth and N-uptake in CT did not affect either yield or seed quality for the three years studied. It is concluded that, under the conditions reported in this paper, CT (advantageous for the driest years) was effective in increasing OM and N in the top soil, but greatly reduced early growth and N uptake of the crop, an important aspect to be considered in the long-term.

## ARI

Grazhdani S, Dhima S and Fernández JE

**Estimating reference evapotranspiration for the climatic conditions od south-eastern Albania**

Revista: Agricoltura Mediterranea
Editor:
Volumen: 128 ISSN:
Paginas: 76 - 80 Ciudad:
Incluido en SCI: No

**Resumen.-** In this paper we compare measured reference evapotranspiration ($ET_o$) with calculated reference evapotranspiration in the experimental field of the Soil Science Institute of Tirana, close to the city of Korça (south-eastern Albania, 41° 35' N 20° 46' W, and 899 m above sea level). The reference crop was grass 0.08-0.15 m high. We used a drainage lysimeter to measure $ET_o$, and we calculated $ET_o$ by four different equations: Penman, FAO-24 Penman, Penman-Monteith and a modified Penman equation. We used data from 1982 to 1992, averaged on a ten-day basis, for making linear regression analysis, using measured $ET_o$ as dependent variable and calculated $ET_o$ as independent variable. Results showed that the Penman-Monteith model fitted the calculated values better. The Penman and modified Penman equations tended to overestimate the measured $ET_o$, whereas the FAO-24 Penman equation tended to underestimate it.

## ARI

Fernández JE, Murillo JM, Moreno F, Cabrera F and Fernández-Boy E

**Reducing fertilization for maize in southwest Spain**

Revista: Commun. Soil Sci. Plant Anal.

Editor: Marcel Dekker, Inc.
Volumen: 29 ISSN: 0010-3624
Paginas: 2829 - 2840 Ciudad: New York, EE.UU.
Incluido en SCI: Sí

**Resumen.-** A high nitrate pollution of groundwaters has been detected in recent years in many areas of south-west Spain where maize is cropped. This may be caused by the high fertilization level used in those areas. In this work, maize was grown consecutively for six years (1991-96) under Mediterranean management practices in the Guadalquivir river valley (south-west Spain), using both a fertilization level widely used in the area (510 kg N $ha^{-1}$ $yr^{-1}$) and one third of it. The effect of the reduced fertilization on crop development, yield parameters and kernel analysis was studied. Nitrate leaching for each fertilization treatment was also monitored, during one experimental year. Crop development was slightly poorer in the plot with reduced fertilization, but no differences in yield were found. The only effect on kernel composition was a higher N concentration in the kernels of the plot with the higher fertilization level. The amount of N supplied by the reduced fertilization, together with the N in the irrigation water and from the soil mineralization, was enough to counterbalance the N removed by the crop in years of high production. Nitrate leakage was three times greater in the plot with the higher fertilization level than in the plot with reduced fertilization. A marked reduction in crop performance was observed in both plots in the first three experimental years. Some stabilization was observed afterwards.

## ARI

José M. Murillo, Francisco Cabrera, Rafael López y Piedad Martín-Olmedo

**Sunflower Response to the Application of a Concentrated Beet Vinasse**

Revista: Commun. Soil Sci. Plant Anal.
Editor: Marcel Dekker, Inc.
Volumen: 29 ISSN: 0010-3624
Paginas: 643 - 655 Ciudad: Monticello, New York, EE.UU.
Incluido en SCI: Sí

**Resumen.-** Present paper deals with the effect of a concentrated, depotassified, Beta vulgaris L. vinasse (desugared beet molasses, 3.5% N, 2% Na) on germination and growth of Helianthus annuus L. Compared to other species (Lepidium sativum L., Sorghum vulgare Pers., Lolium multiflorum Lam., Triticum aestivum L., Hordeum vulgare L., Medicago sativa L. and a wild Melilotus segetalis (Brot.) Ser.), sunflower, and ryegrass, had the smallest 'in vitro' germination indices under both solutions of 0.15 and 0.50% of pure vinasse. However, seedling emergence, plantlet growth and nutrient content of sunflower grown in pots, in three different soil types, were not negatively affected by the application of a moderate dose of pure vinasse (roughly equivalent to 2-3 t ha-1) at sowing or 30 days before. In a field experiment, the application of a similar dose of vinasse did not have any detrimental effects on sunflower growth, with the achenes reaching similar oil and fatty acid contents under both vinasse treatments (application at sowing and 30 days before) and control. The application of vinasse at sowing can partially avoid losses of N that can take place if the vinasse is applied too far in advance of sowing.

## ARI

del Río J.C., McKinney D.E., Knicker H., Nanny M.A., Minard R.D. and Hatcher P.G.

**Structural characterization of bio- and geomacromolecules by off-line thermochemolysis with tetramethylammonium hydroxide (TMAH)**

Revista: J. Chromatogr. A
Editor: Elsevier Science B.V.
Volumen: 823 ISSN: 0021-9673
Paginas: 433 - 448 Ciudad:
Incluido en SCI: Sí

**Resumen.-** A new analytical procedure, tetramethylammonium hydroxide (TMAH) thermochemolysis, was used to structurally characterize a variety of bio- and geopolymers. The technique cleaves esters and some ethers in macromolecular organic matter, yielding low-molecular weight monomers such as methyl esters of carboxylic acids and methyl ethers of alcohols that are amenable to gas chromatographic analysis. This procedure can be conducted in sealed glass ampoules, which means that it can be easily implemented in any laboratory having gas chromatographic capabilities, in contrast to other chemolytic or pyrolytic procedures. A set of bio-geomacromolecules, ranging from gymnosperm and angiosperm woods, natural polyesters such as cutin, dissolved organic matter in natural and oceanic waters, and humic substances were characterized with this procedure. The information obtained provides molecular-level details which can be used to infer structural composition.

## ARI

del Río J.C., Gutiérrez A., González-Vila F.J., Martín F. and Romero J.

**Characterization of organic deposits produced in the kraft pulping of Eucalyptus globulus wood**

Revista: J. Chromatogr. A
Editor: Elsevier Science B.V.
Volumen: 823 ISSN: 0021-9673
Paginas: 457 - 465 Ciudad:
Incluido en SCI: Sí

**Resumen.-** The composition of the organic deposits (the so-called pitch deposits) accumulated in different parts of the mills during the Kraft pulping of Eucalyptus globulus wood using an ECF (elementary chlorine free) bleaching sequence has been studied. Three pitch deposits were selected in the bleaching sequence. The first one was taken just after the kraft pulping and the oxygen prebleaching step, while the other two were taken from different parts of the mill after the chlorine dioxide bleaching step. The pitch deposits were Soxhlet extracted with acetone, and the extracts were redissolved in chloroform and subsequently analyzed by gas chromatography (GC) and gas chromatography-mass spectrometry (GC-MS). The composition of E. globulus wood extractives was also analyzed for comparison. High temperature short capillary columns were used for the GC and GC-MS analyses, which enabled the elution and separation of compounds with a wide range of molecular weight, with no prior derivatization nor fractionation. Sterols and sterol esters were major compounds in the lipidic extractives of E. globulus wood, and hence, contribute to pitch deposition during pulping. The composition of the pitch deposits varied along the bleaching sequence. The kraft cooking and oxygen prebleaching had a minor influence on the composition of the extract of the pitch deposits. These extracts were very similar to those of E. globulus wood extractives, but with a higher content of waxes. No structural changes of sterols and sterol esters were observed. In contrast, after chlorine dioxide bleaching (ECF), the deposits were composed of saturated sterols and sterol esters, with the remarkable absence of unsaturated sterols and sterol esters, mainly the b-sitosterol and b-sitosterol esters, which were completely degraded. The insoluble residues left after acetone extraction of the pitch deposits were analyzed by Curie-point flash-pyrolysis-GC-MS and by pyrolysis-methylation-GC-MS. Whereas conventional pyrolysis released series of n-alkanes/n-alkenes, a series of fatty acid methyl esters were released after pyrolysis-methylation, suggesting that the residues left after acetone extraction might be made up of fatty acids salts. Very minor amounts of ellagic acid were also found in all the pitch deposits, probably deposited as magnesium complex.

## ARI

Gutiérrez A., del Río J.C., González-Vila F.J. and Martín F.

**Analysis of lipophilic extractives from wood and pitch deposits by solid-phase extraction and gas chromatography**

Revista: J. Chromatogr. A
Editor: Elsevier Science B.V.
Volumen: 823 ISSN: 0021-9673
Paginas: 449 - 455 Ciudad:
Incluido en SCI: Sí

**Resumen.-** An analytical procedure for the analysis of lipophilic extractives from wood, pulp and pitch deposits is described in this paper. It comprises a rapid gas chromatographic method that enables the analysis of high number of samples in a short period of time. Short-length, high temperature capillary columns with thin films and high temperature-programming rates were preferred for the rapid analysis of wood extractives since they enable elution and separation of compounds within a wide Mw-range (from fatty acids to sterol esters and triglycerides) in the same chromatographic analysis in a short period of time. Several examples of analysis of extractives from pine and eucalypt woods and pitch deposits in an eucalypt kraft pulp, are shown. On the other hand, a simple fractionation method using solid-phase extraction (SPE) in amino-propyl cartridges is described for the preparative scale separation and fractionation of wood lipophilic extractives into major lipid classes. The SPE advantages include smaller sample and solvent requirements and simpler use than conventional solvent extraction techniques.

## ARI

del Río J.C. and Hatcher P.G.

**Analysis of aliphatic biopolymers using thermochemolysis with tetramethylammonium hydroxide (TMAH) and gas chromatography-mass spectrometry**

Revista: Org. Geochem.
Editor: Elsevier Science
Volumen: 29 ISSN: 0146-6380
Paginas: 1441 - 1451 Ciudad:
Incluido en SCI: Sí

**Resumen.-** Selected aliphatic biopolyesters (cutins, cuticles and a suberin) isolated from different plants have been analyzed using thermochemolysis with tetramethylammonium hydroxide (TMAH). This method consists of a high-temperature saponification/transesterification, and yields methyl esters of fatty acids and the methyl ethers of alcohols, which are subsequently analyzed by gas chromatography and gas chromatography-mass spectrometry. The main compounds produced from the analyzed samples correspond to the methyl derivatives of long-chain fatty acids, hydroxy fatty acids and a,w-alkanedioic acids. The composition of the released compounds are similar to those reported in the literature using different depolymerization methods. The main advantage of the procedure is that it is easily performed in glass tubes with very low amounts of sample and without additional derivatization steps prior to gas chromatographic analysis because the products are methylated in situ. The method also avoids the laborious and time consuming sample preparation of extractive methods and the use of large amounts of solvents.

## ARI

Gutiérrez A., del Río J.C., González-Vila F.J. and Romero J.

**Variation in the composition of wood extractives from Eucalyptus globulus during seasoning**

Revista: J. Wood Chem. Technol.
Editor: Marcel Dekker, Inc.
Volumen: 18 ISSN: 0277-3813
Paginas: 439 - 446 Ciudad:
Incluido en SCI: Sí

**Resumen.-**The variation in the extractives content from E. globulus wood has been studied during a three-month seasoning experiment. The decrease in the total acetone extract (by over 56%) after seasoning is related to a parallel reduction on the colloidal pitch measured in black liquors. On the other hand, the composition of lipophilic extractives during the seasoning period has been studied by gas chromatography and gas chromatography-mass spectrometry. Fatty acids, sterols, sterol esters, triglycerides and steroid ketones were the main lipophilic compounds among E. globulus wood extractives. The content of these compounds decreased significantly during seasoning.

## ARI

Almoguera, C., Prieto-Dapena, P., Jordano, J

**Dual regulation of a heat shock promoter during embryogenesis: stage-dependent role of heat shock elements**

Revista: The Plant Journal
Editor: Blackwell Science ltd.
Volumen: 13 ISSN: 0960-7412
Paginas: 437 - 446 Ciudad: Edimburg, Reino Unido
Incluido en SCI: Sí

**Resumen.-** Transgenic tobacco expression was analyzed of chimeric genes with point mutations in the Heat Shock Element (HSE) arrays of a small Heat Shock Protein (sHSP) gene from sunflower: Ha hsp17.7 G4. The promoter was developmentally regulated during zygotic embryogenesis and responded to heat stress in vegetative tissues. Mutations in the HSEs affected nucleotides crucial for human Heat Shock transcription Factor 1 (HSF1) binding. They abolished the heat-shock response of Ha hsp17.7 G4 and produced expression changes that demonstrated dual regulation of this promoter during embryogenesis. Thus, whereas activation of the chimeric genes during early maturation stages did not require intact HSEs, expression at later desiccation stages was reduced by mutations in both the proximal (-57 to -89) and distal (-99 to -121) HSEs. In contrast, two point mutations in the proximal HSE that did not severely affect gene expression during zygotic embryogenesis, eliminated the heat-shock response of the same chimeric gene in vegetative organs. Therefore, by site directed mutagenesis we were able to separate the heat-shock response of Ha hsp17.7 G4 from its developmental regulation. The results indicate the coexistence in a single promoter, of HSF-dependent and -independent regulation mechanisms, that would control sHSP gene expression at different stages during plant embryogenesis.

## ARI

Socias-Viciana, M.M., Hermosin M.C. y Cornejo J.

**Removing prometrone from water by clays and organic clays**

Revista: Chemosphere
Editor: Pergamon, Elsevier Sci. Ltd.
Volumen: 37 ISSN: 0045-6535/98
Paginas: 289 - 300 Ciudad: Oxford, Reino Unido
Incluido en SCI: Sí

**Resumen.-** The removing power of natural or inorganic clays and organoclays (OCls) for prometone from water was studied as related to the clay layer charge density, organic cation type and organic cation saturation degree of the clay. Two different natural smectites (high charge SAz and low charge SWy) and those treated with two alkylammonium cations (octadecylammonium and hexadecyltrimethylammonium) were assayed by measuring the adsorption isotherms and fitting the data to the Freundlich equation. The Freundlich parameter Kf, the distribution coefficients Kd0.3 and, that on organic carbon basis, Koc were calculated and used as relative measures of the sorption capacity. The inorganic original smectites show low and medium prometrone adsorption (KfSAz=29 and KfSWy=138 mmol/kg) inversely proportional to their layer charge density, although the relative sorption capacity depends on the prometrone concentration level. The OCls generally adsorb more prometrone (Kf from 61 to 1031 mmol/kg) than the inorganic samples. The organoclay characteristics favouring the prometrone sorption are high charge density, quaternary alkylammonium in the interlayer and organic cation saturation slightly below CEC. However, for low charge smectite primary alkylammonium and organic cation saturation above CEC promoted herbicide adsorption

## ARI

Celis, R. , Cornejo, J., Hermosin, M.C. y Koskinen W.C.

**Sorption of atrazine and simazine by model associations of soil colloids**

Revista: Soil Sci. Soc. Am. J.
Editor: ASA, CSSSA & SSSA
Volumen: 62 ISSN: 0367-5995
Paginas: 165 - 171 Ciudad: Madison, EE.UU.
Incluido en SCI: Sí

**Resumen.-** Association processes between the different soil constituents may greatly influence the sorptive behavior of soil aggregates. In this work we studied the sorption-desorption of the s-triazine herbicides atrazine and simazine on binary and ternary model associations of montmorillonite, ferrihydrite and humic acid was determined using the batch equilibration procedure. Results were compared with sorption-desorption on the single model constituents. Iron species and humic substances coatings on montmorillonite increased the sorption of the herbicides on the clay. Protonation of atrazine and simazine catalyzed by hydroxy iron polymers and functional groups of humic acid on the surface of montmorillonite was proposed to be the responsible of enhanced sorption on the clay. Sorption studies of atrazine and simazine on a clay-ferrihydrite-humic acid model soil aggregate indicated that humic substances can hinder the access of herbicide molecules to iron species coatings on montmorillonite, specially when there is a high interaction organic
matter-iron coated clay. Sorption-desorption of atrazine and simazine by the sorbents studied was found to be reversible.

## ARI

Celis, R., Cornejo, J. y Hermosin, M.C.

**Textural properties of synthetic clay-ferrihydrite associations**

Revista: Clay Minerals
Editor: Mineralogical Soc., Black Bear Press Ltd.
Volumen: 33 ISSN: 0009-8558
Paginas: 395 - 407 Ciudad: Londres, Reino Unido
Incluido en SCI: Sí

**Resumen.-** Kaolinite-ferrihydrite and montmorillonite-ferrihydrite associations were prepared following a procedure based on the Russell method for the synthesis of ferrihydrite and texture of the clay-ferrihydrite complexes was studied using different techniques. Textural properties of kaolinite were little affected by Fe association, showing only a slight increase in the specific surface area measured by nitrogen adsorption and a decrease in largest pores (> 10 μm), as measured by mercury porosimetry. In contrast, nitrogen specific surface area of the montmorillonite complexes were much higher than that of the clay without Fe and the pore structure depended on the amounts of Fe in the complexes. Application of the fractal approach to nitrogen adsorption data indicated that the surface roughness (microporosity) was higher for the complexes prepared from diluted Fe(III) solutions, in agreement with the information obtained from classical interpretation of the adsorption isotherms (shape of the isotherms and t-plots).

## ARI

Cox, L., Koskinen, W.C., Celis, R., Yen, P.Y., Hermosin, M.C. y Cornejo, J.

**Sorption of imidacloprid on soil clay mineral and organic components**

Revista: Soil Sci. Soc. Am. J.
Editor: ASA, CSSA & SSSA
Volumen: 62 ISSN: 0367-5995
Paginas: 911 - 915 Ciudad: Madison, EE.UU.

Incluido en SCI: Sí

**Resumen.-** Soil clay (mineral and organic components) has been shown to be responsible for sorption of many pesticides. Sorption of pesticides by soil colloidal particles affects their transport in runoff, surface waters, and to ground water. This study assessed the influence of the different components of the clay fraction of five soils and model sorbents (montmorillonite, iron oxide and humic acid) and their binary and ternary associations on sorption of the insecticide imidacloprid. Sorption coefficients on soil clay fractions did not correlate with any single component, but when organic matter was reduced by H2O2 treatment, sorption decreased although Koc increased, indicating a contribution of the surfaces of mineral components of the soil clay in sorption of imidacloprid. This increase was greater on clays whose surface areas substantially increased after H2O2 treatment. Imidacloprid sorbed on SWy-montmorillonite and humic acid, whereas sorption was very low on iron oxide.Sorption coefficient Kd for SWy-Fe montmorillonite was higher than for SWy-Ca, and increased from 15 to 180 when pH was decreased from 3.5 to 1.0, suggesting protonation of the -NH group of the imidazol ring. Sorption on binary and ternary associations of these model adsorbents indicated that organic matter is the most important single component affecting sorption of imidacloprid, but that there is also a contribution to sorption by the mineral surfaces.

## ARI

J.L. Pérez-Rodríguez, C. Maqueda, M.C. Jiménez de Haro and P. Rodríguez-Rubio

**Effect of pollution on polychromed ceramic statues.**

Revista: Atmospheric Environment
Editor:
Volumen: 32 ISSN:
Paginas: 993 - 998 Ciudad:
Incluido en SCI: Sí

**Resumen.–** Pigments of different colours used to polychrome ceramic statues have been characterized using different experimental techniques. The pigments detected in the painting layer belong to the group of natural minerals widely used in antique paintings. The polluted air and the composition of dust and crust on the ceramic surface have been analysed. Environmental pollution has altered the surface of the ceramic sculptures, destroying the polychrome, so that only small parts covered by crust or dust remain. The environment is responsible for transformation of the chemical components of the pigments. The lead compounds minium and hydrocerissite are altered to anglesite, cerussitte, hydrocerussite and lead sulphide. Azurite, forming some blue colour, is hydrated to malachite wich is green. Atacamite is formed by the transformation of azurite in the presence of the chloride ion from environmental pollution. The environment supplies a variety of organic compounds —mainly alkanes (produced by petrol combustion)— which are responsible for the black coating on the polychrome, which serves as nutrition microbiological growth.

## ARI

C. Maqueda, T. Undabeytia and E. Morillo

**Retention and release of copper on montmorillonite as affected by the presence of a pesticide.**

Revista: J. Agric. Food Chem.
Editor:
Volumen: 46 ISSN:
Paginas: 1200 - 1208 Ciudad:
Incluido en SCI: Sí

**Resumen.-** The effect of the cationic pesticide chlordimeform (N´-[-4-choro-2 methylphenyl]-N,N-dimethylmethanimidamide hydrochloride) on adsorption-desorption processes of copper onto the clay mineral montmorillonite has been studied. This effect was evaluated when both adsorbates were adsorbed simultaneously and when the pesticide was previously adsorbed on montmorillonite. For different concentrations of pesticide used, copper adsorption decreases (in relation to pesticide-free treatment) when both adsorbates are adsorbed simultaneously, indicating a competition between both cations for interlamellar possitions. In contrast, copper adsorption increases when the pesticide is previously adsorbed.

Copper desorption isotherms show a very high hysteresis. The maximum percentage of copper desorbed is only 7%, being lower when pesticide is present, and decreasing with pesticide concentration.

## ARI

C. Maqueda, J.L. Pérez-Rodríguez and J. Lebrato

**An Evaluation of clay minerals as support materials in anaerobic digesters.**

Revista: Environ. Technol.
Editor:
Volumen: 19 ISSN: 0959-3330

Paginas: 811 - 819 Ciudad:
Incluido en SCI: Sí

**Resumen.-** The use of different clay minerals as support in anaerobic digestion has been studied. The support materials were evaluated in a batch microdigester and their effect in the digestion process was measured at the beginning of the process (startup) and at an intermediate point of the digestion process when the maximum differences between support materials were observed (working digester). All the systems with support were more efficient than the control (support-free). The following order of purification was established:
STARTUP: Bentonite > talc > vermiculite > nontronite > montmorillonite > pyrophyllite > stevensite > sepiolite.
WORKING DIGESTER: Sepiolite > stevensite > talc > nontronite > bentonite > montmorillonite > vermiculite > pyrophyllite.
Bentonite, montmorillonite, talc and vermiculite were favourable for startup, as they rapidly released Ca2+ or Mg2+ to the medium. The best COD removal efficiencies were obtained with sepiolite and stevensite which release Mg2+ progresively to the medium. The presence of Fe3+, Co2+ and Ni2+ in the structure of the mineral stimulated anaerobic digestion.

## ARI

T. Undabeytia, S. Nir, G. Rytwo, E. Morillo and C. Maqueda
**Modelling adsorption-desorption processes of Cd on montmorillonite.**
Revista: Clays Clay Miner.
Editor:
Volumen: 46 ISSN:
Paginas: 423 - 428 Ciudad:
Incluido en SCI: Sí

**Resumen.-** Adsorption-desorption of Cd to Ca montmorillonite was studied at concentrations ranging from 44.5 to 266.8 μmol. An adsorption model was employed in the analisis of the data. The procedure consists of solving the electrostatic Gouy-Chapman equations and calculating adsorbed amounts of the cations as the sum of the cations residing in the double-layer region, and the cations chemically bound to the surface, in a closed system. The model also accounts explicitly for cation complexation in solution. The model yields good predictions for the adsorbed amounts of Cd, Ca and Mg, by employing calculations also yield good predictions for the apparent hysteresis observed in the adsorbed amounts of Cd after each of three cycles of desorption. The apparent hysteresis is explained by the reduction in the total concentration of Ca and Mg in desorption cycles, and the corresponding increase in the magnitude of the surface potential. Our estimates indicate that adsorption of Cd is mostly to planar, rather than edge sites of the cl

## ARI

C. Maqueda, E. Morillo, T. Undabeytia and F. Martín
**Sorption of glyphosate and Cu(II) on a natural fulvic acid complex: mutual influence.**
Revista: Chemosphere
Editor:
Volumen: 37 ISSN: 0045-6535
Paginas: 1063 - 1072 Ciudad:
Incluido en SCI: Sí

**Resumen.-** The mutual influence of the pesticide glyphosate (Gps) and copper on their adsorption on a natural metal-fulvic acid complex (M-FA) has been studied. The complex was extracted from a podsol and contains 22.16% Fe and 7.54% Al.

High adsorption of Gps on M-FA is observed, but it decreases slightly in the presence of Cu(II) in solution. This is due to formation of very strong metal-Gps complexes, either with the added Cu or with Fe and Al desorbed from the M-FA complex. These complexes have a lower tendency to be adsorbed than the free Gps. Al and Fe desorption is more marked as higher is the concentration of Cu and GPS in solution, due to the decrease of equilibrium pH, to their displacement from the FA complex by $Cu^{2+}$ ions and to ligand exchange of Gps for FA in the complex.

In contrast, the adsorption of Cu increases as the concentration of Gps increases, since the formation of Gps complexes with Al and Fe in solution originates vacant positions on M-FA, facilitating copper adsorption.

## ARI

J.I. Pérez-Martínez, M.J. Arias, J.M. Ginés, J.R. Moyano, E. Morillo, P.J. Sánchez-Soto and Cs. Novak
**2,4-D a-cyclodextrin complexes. Preparation and characterization by thermal analysis**
Revista: J. Thermal Anal.
Editor:
Volumen: 51 ISSN: 1418-2874
Paginas: 965 - 972 Ciudad:

Incluido en SCI: Sí

**Resumen.-** The aquous solubility of the pesticide 2,4-D was improved by inclusion complexation with α-CD. The formation of such inclusion compounds was studied via the phase-solubility diagram (solution state) and by DSC and HSM (solid state). 2,4-D presented a typical $B_S$ Higuchi solubility curve, coprecipitating a 1:2 pesticide-α-CD complex. In order to obtain solid complexes, three processing methods were checked: Kneqading, coprecipitation and spray-drying. DSC and HSM showed that only the last two of these yielded true inclusion compounds.Chemical analysis also revealed that the stoichiometry of such solid complexes corresponds to a 2,4-D-α-CD ratio of 1:2.

## ARI

J.M. Ginés, M.J. Arias, J.I. Pérez-Martínez, I.R. Moyano, E. Morillo and P.J.Sánchez-Soto

**Determination of the stoichiometry of 2,4-dichlorophenoxyacetic acid-B-cyclodextrin complexes in solution and in solid state.**

Revista: Thermochim. Acta
Editor:
Volumen: 321 ISSN: 0040-6031
Paginas: 53 - 58 Ciudad:
Incluido en SCI: Sí

**Resumen.-** Chemical analysis, thermal analysis by Differential Scanning Calorimetry (DSC), and solubility determinations have been applied to the study of solid complexes of a pesticide, 2,4-dichlorofenoxyacetic acid (2,4-D) as guest, and ß-cyclodextrin (ß-CD) as host in order to achieve experimental evidences of the inclusion process and further determine the stoichiometry of the inclusion compound. Three different methods have been studied and compared: physical (mechanical) mixing, kneading and spray-drying. The phase solubility diagram of complex formation in solution was also established. The stoichiometric ratio of the complexes was found to be 1:1 by solubility and thermal analysis, being corroborated by chemical analysis of the pure solid complexes after washing with ethanol. Spray-drying was found the most suitable method of complexation.

## ARI

G. Almendros, F.J. González-Vila, F. Martín, J. Sanz and C. Alvarez-Ramis

**Appraisal of pyrolytic techniques on different forms of organic matter from a Cretaceous basement in Central Spain**

Revista: Organic Geochemistry
Editor: Elsevier
Volumen: 28 ISSN: 0146-6380/98
Paginas: 613 - 623 Ciudad: Oxford, Reino Unido
Incluido en SCI: Sí

**Resumen.-**Pyrolytic techniques were used to characterize three different forms of fossil organic matter in Cerro de la Mesa (an important Cretaceous paleobotanic basement in Central Spain): two kerogens isolated from carbonaceous marls, and from lignitiferous layers, and well-preserved remains of the fossil Gymnosperm Frenelopsis oligostomata. By conventional flash pyrolysis the Frenelopsis remains released mainly alkyl-substituted phenols and polyaromatic compounds, whereas the organic matter from the lignitiferous layer is dominated by phenols and that from the carbonaceous marls by polycyclic and aliphatic compounds. Pyrolysis-thermochemolysis alkylation in the presence of tetramethylammonium hydroxyde (TMAH) allowed the detection of additional diagnostic compounds, such as series of methylated fatty acids, benzenecarboxylic and phenolic acids, which revealed further differences between the three materials studied. The chemical characterization of the organic matter in addition to the micropalaeontological study suggests that the Frenelopsis remains consist mainly of heavily altered lignin and cuticular lipid biomacromolecules, whereas the materials from the lignitiferous layers and the carbonaceous marls correspond to intermediate coalification stages of woody plants, the latter showing the greatest degree of selective preservation of aliphatic structures. The comparison of the above results with those obtained by thermochemolysis suggests that the latter technique produces independent and complementary reactions to conventional pyrolysis, providing additional information to an extent which depends mainly on the polyalkyl and oxidized character of the sample.

## ARI

G. Almendros, M.E. Guadalix, F.J. González-Vila and F. Martín

**Distribution of structural units in humic substances as revealed by multi-step selective degradations and 13C-NMR of successive residues**

Revista: Soil Biology and Biochemistry
Editor: Elsevier
Volumen: 30 ISSN: 0038-0717/98

Paginas: 755 - 765 Ciudad: Oxford, Reino Unido
Incluido en SCI: Sí

**Resumen.-**A quantitative assessment of structural constituents in humic substances has been achieved on the basis of 13C NMR spectra of the residues obtained after multi-step chemical degradations. The sequence used (ultrasonic disruption in methylene chloride, followed by boron-trifluoride-methanol transesterification and hydroiodic acid treatment) was designed to progressively remove structures predominantly associated by physical interactions, ester bonds and ether bonds, leading to a residue presumably consisting of a C-C linked skeletal network. The substances analyzed were humic acids (HAs) from four widely different soil types in addition to the corresponding humins isolated by two procedures based, respectively, on flotation in a dense liquid after ultrasonic disaggregation and on partition in water-methylisobutylketone. About 30% of the carbon in HAs and humins turned into soluble materials by the transesterification treatment, whereas a large variability in the amount of the structures removed by the ether-cleaving treatment was observed, the greatest values corresponding to humins. In both cases, the above treatments seem to lead to kerogen-like residue. The results provide indirect evidence for the presence of non-hydrolizable esters, heavily altered glycolipid-like structures and recalcitrant polymethylene material in humic substances.

## ARI

L. Madrid, E. Díaz-Barrientos

**Release of metals from homogeneous soil columns by wastewater from an agricultural industry.**

Revista: Environmental Pollution
Editor: Elsevier
Volumen: 101 ISSN:
Paginas: 43 - 48 Ciudad:
Incluido en SCI: Sí

**Resumen.-** The effect of discharging olive mill wastewater (OMW) in soils on the release of metals previously retained by them is simulated by leaching homogeneous soil columns with a solution of the residue after passing solutions of Cu or Zn through the columns. The effect of other residues previously added to the soil as composts in field experiments on the behaviour observed in the laboratory is also discussed. OMW shows a strong power for releasing the metals retained. Previous addition of a compost made from olive mill sludge and plant refuse to the soil causes a significant reduction of the release of retained metal by liquid OMW. Previous addition of concentrated sugarbeet vinasse causes much less significant effects.

## ARI

L. Madrid, E. Díaz-Barrientos

**Mobility of cadmium added to a soil treated with agricultural residues**

Revista: Fresenius Environmental Bulletin
Editor: Birkhäuser Verlag
Volumen: 7 ISSN:
Paginas: 849 - 858 Ciudad:
Incluido en SCI: Sí

**Resumen.-** The release of cadmium added to columns of a sandy soil by solutions of indifferent electrolyte or of olive mill wastewater is studied. The influence of previous field treatments with two amendments obtained from agricultural wastes is also investigated. It is concluded that field treatment with agricultural wastes rich in solid organic matter enhances cadmium immobilisation by the soil, and leaching by wastewaters rich in organic complexants (as simulated with a diluted solution of olive mill wastewater, OMW) causes a slow release of a minor part of the retained metal. On the contrary the untreated soil releases a large proportion of the retained metal when receiving OMW, suggesting that metal binding to mineral surfaces is comparatively weaker than binding to the dissolved organic matter in OMW. The behaviour of the soil which had received soluble field amendments is similar to that of the untreated soil. When the metal is added to the column in solutions simultaneously containing OMW, the retained metal is more readily removable by subsequent leaching with KNO3 than when it is added in a solution of the latter electrolyte.

## ARI

Marañón, T.

**Soil seed bank and community dynamics in an annual-dominated Mediterranean salt-marsh**

Revista: Journal of Vegetation Science
Editor: Opulus Press
Volumen: 9 ISSN: 1100-9233
Paginas: 371 - 378 Ciudad: Uppsala, Suecia
Incluido en SCI: Sí

**Resumen.-** An average of 49,110 seeds/m2, belonging to 29 species, was calculated in the soil and litter of an annual grassland in the upper salt-marsh of the Guadalquivir delta (SW Spain). Field censuses of the grassland, in two consecutive springs, yielded 7,410 and 9,520 plants/m2 respectively. A combined CA analysis of the seed bank samples and field censuses showed differences in grassland composition between wet and dry years. The environmental changes induced different expressions of the soil seed bank, mediated by demographic processes.

The effect of salinity (25 dS/m of NaCl) was studied on intact soil blocks transplanted to a greenhouse. Salinity did not affect the emergence of seedlings, but did reduce the growth of the dominant species, Trisetaria panicea.

The importance of the role of seed banks in community dynamics, and their use for conservation management, are discussed.

## ARI

Ojeda, F., J. Arroyo y T. Marañón

**The phytogeography of European and Mediterranean heath species (Ericoideae, Ericaceae): a quantitative analysis**

Revista: Journal of Biogeography
Editor: Blackwell
Volumen: 25 ISSN:
Paginas: 165 - 178 Ciudad: Oxford, Reino Unido
Incluido en SCI: Sí

**Resumen.-** The geographic ranges of heath species in Europe and the Mediterranean and their relationships with environmental (climatic and ecogeographic) variables and biological features are analysed by means of multivariate method. In particular, TWINSPAN classifications into floristic elements and floristic regions, DCA floristic ordinations, CCA environment-constrained ordinations and CCA biology-constrained ordinations are carried out. Results of the analyses show a correspondence with conventional regionalization analyses based on broader criteria, and less correspondence with numerical analyses of other taxonomic groups at similar scale. This lack of fit depends on the particular history and ecology of the taxonomic groups under study. A number of climatic (temperature and water stress) and geographic (coast length) variables are associated with different types of heaths according to their geographical ranges (continental, Mediterranean, Atlantic). Biological features of heaths account for a small part of the variation in range, but the association of temperate heaths with a preference for acid soils, of Mediterranean heaths with pubescence, and of Atlantic heaths with plant height is of interest. Heath species richness throughout Europe and the Mediterranean is analysed by multiple regression analyses and, apart from a strong influence of area size, a significant effect of water conditions, temperature and proximity to sea is detected. The area with the highest heath species richness is Western Mediterranean. Additional classification, ordination and multiple regression analyses of heaths in the Iberian Peninsula (Spain and Portugal, the areas with the highest heath diversity) revealed similar patterns to those found in Europe and the Mediterranean. The effect of heterogeneity of the studied units at this latter scale is removed in the Iberian analysis because of the relative homogeneity of the units considered at this scale.

## ARI

M. Rieu, R. Vaz, F. Cabrera y F. Moreno.

**Modelling the concentration or dillution of saline soil-water systems.**

Revista: European Journal of Soil Science
Editor: Blackwell Science ltd.
Volumen: 49 ISSN: 1351-0754
Paginas: 53 - 63 Ciudad:
Incluido en SCI: Sí

**Resumen.-** A model (EXPRESO) was designed to calculate both the chemical speciation of electrolyte solution and the exchange equilibrium with an adsorbed phase during dilution and concentration processes. EXPRESO was validated using reclaimed saline soil samples. Results demonstrated that EXPRESO is a thermodynamically coherent and mass conservative model that allowed the calculation of the chemical composition of both the soil solution and the exchange complex over a large range of soil water content (0.250 to 5 kg water/kg of soil). EXPRESO enables the estimation of the chemical composition of the in situ soil solution, giving a more comprehensive picture of the soil status under different field conditions.

## ARI

E. Fernandez-Boy, F. Cabrera, E. Madejon, M.J. Diaz. F. Moreno y J.P. Calero.

**Analysis of cations in drainage water and soil solution by single-column ion chromatography**

Revista: Journal of Chromatography A
Editor: Elsevier Science B.V.
Volumen: 823 ISSN: 0021-9673

Paginas: 279 - 283 Ciudad:
Incluido en SCI: Sí
**Resumen.-** A single column ion chromatography (SCIC) for cation determination in drainage water and soil solution was tested. Using a 100 µl sample loop, the SCIC detection limits were 0.04 mg l-1 for Na+, 0.02 mg l-1 for NH4-N, 0.06 mg l-1 for K+, 0.05 mg l-1 for Mg2+, and 0.085 mg l-1 for Ca2+. Results were highly reproducible in wide ranges of concentrations. Results obtained by the SCIC method were compared with those by EAS (Na+ and K+) and AAS (Mg2+ and Ca2+). Student-t test and regression analysis showed that corresponding methods agree closely.

## ARI

Cox, L., Koskinen, W.C. y Yen, P.Y.
**Influence of soil properties on sorption-desorption of imidacloprid**
Revista: J. Environ. Sci. and Health, B
Editor: Marcel Dekker, Inc.
Volumen: 33 ISSN: 0360-1234
Paginas: 123 - 134 Ciudad: Nueva York, EE.UU.
Incluido en SCI: Sí
**Resumen.-** Imidacloprid [1-[(6-chloro-3-pyridinyl)methyl]-N-nitro-2-imidazolidinimine] is a new systemic insecticide used as soil treatment, seed dressing, and foliar treatment. Sorption-desorption studies were conducted with seven U.S. soils varying in their physicochemical properties (OC= 0.3-4 %, Clay= 3-43 %, pH= 5.7-7.8, CEC= 3.62-41) using the batch equilibration method. Initial imidacloprid concentrations ranged from 3 to 300 mg L-1. Sorption coefficients Kf and the soil properties organic carbon and CEC gave the higher single correlation coefficients; the last due to the positive correlation between OC and CEC. Sorption was irreversible, and hysteresis coefficients in general, higher at low soil solution concentrations. Sorption coefficients Kf were significantly lower at 1:5 soil/solution ratio than at 1:1. This suggests a possible effect of a soluble soil component, such as salt concentration, on sorption; no significant differences in pH between solutions were detected.

## ARI

E. Fernandez-Boy, F. Cabrera y F. Moreno
**Analysis of inorganic anions in drainage water and soil solution by single-column ion chromatography**
Revista: Journal of Chromatography A
Editor: Elsevier Science B.V.
Volumen: 823 ISSN: 0021-9673
Paginas: 285 - 290 Ciudad:
Incluido en SCI: Sí
**Resumen.-** A single-column ion chromatography (SCIC) for anion determination in drainage water and soil solution was tested. The SCIC minimum detection limits (100 µl sample loop) were 0.75 mg l-1 for Cl-, 0.2 mg l-1 for NO2-N, 0.02 for NO3-N, 1.25 mg l-1 for HPO4-P, and 0.5 mg l-1 for SO4-S. The results showed a high reproducibility. Results for Cl-, NO3-N, and SO4-S obtained by the SCIC method were compared with those by the traditional methods; Student-t test and regression analysis showed that corresponding methods agree closely.

## ARI

Celis, R., Barriuso, E. y Houot, S.
**Effect of liquid sewage sludge addition on atrazine adsorption and desorptin by soil**
Revista: Chemosphere
Editor: Pergamon Press
Volumen: 37 ISSN: 0045-6535
Paginas: 1091 - 1107 Ciudad: Oxford, Reino Unido
Incluido en SCI: Sí
**Resumen.-** Liquid sewage sludge (LSS) addition to soil incorporates both insoluble suspended organic material and large amounts of dissolved organic matter (LSSDOM) which can influence the sorption-desorption behaviour of pesticides by soil constituents. Batch sorption isotherm techniques were used to determine the relative effect of the insoluble and dissolved organic matter from a LSS on the sorption and desorption of the herbicide atrazine by soil. Atrazine sorption and desorption isotherms were obtained on soil, LSS, LSS-amended soil, and LSSDOM-pretreated soil and described by the Freundlich equation. The overall effect of LSS addition to soil (insoluble and dissolved organic matter) was to increase atrazine sorption, due to the high sorption capacity of the added insoluble organic matter. In contrast, LSSDOM, which was mainly constituted by low molecular weight molecules, decreased atrazine sorption by the soil. No evidences for stable interactions in solution between LSSDOM and

atrazine were found, thus suggesting processes taking place at the soil/solution interface, such as competition for sorption sites on the soil surface, are the main responsible for the observed decrease in atrazine sorption by LSSDOM. Desorption of atrazine from soil was also enhanced by LSSDOM, but this effect was highly reduced when the soil had been pretreated with LSS (insoluble and soluble organic matter) or with LSSDOM alone. In these cases, interactions of LSSDOM with the soil surface have already taken place before the desorption experiment and the LSSDOM effects during desorption are less evident. The results of this work suggest that LSSDOM applied to soils may enhance the risk of groundwater contamination by promoting atrazine desorption from soil, especially when the soil surfaces are free of LSSDOM.

## ARI

Celis, R., Barriuso, E. y Houot, S.

**Sorption and desorption of atrazine by sludge-amended soil: dissolved organic matter effects**

Revista: Journal Environ. Quality
Editor: ASA, CSSA & SSSA
Volumen: 27 ISSN: 0047-2425
Paginas: 1348 - 1356 Ciudad: Madison, Reino Unido
Incluido en SCI: Sí

**Resumen.-** Addition of insoluble and soluble organic C to soil through management practices, such as sewage sludge (SS) application, may greatly alter pesticide sorption-desorption in soil. Batch equilibrium techniques were used to determine the effects of four sewage sludges (liquid-SS, solid-SS, limed-SS, and composted-SS) and their water dissolved organic matter (DOM), on the sorption-desorption of atrazine (2-chloro-4-ethylamino-6-isopropylamino-1,3,5-triazine) by a silt loam soil. Atrazine sorption on the sludges increased in the order: limed-SS < liquid-SS < solid-SS < composted-SS. Sludge addition to soil increased atrazine sorption in the same order, although the effectiveness of the mixtures to sorb atrazine was lower than expected from the sorption capacity of the isolated soil and sludges. The effects of the DOM extracted from the different sludges on atrazine sorption varied with sewage sludge. For liquid-, solid-, and limed-SS, DOM reduced atrazine sorption on soil. A low association between these DOMs and atrazine was measured in solution by dialysis technique, and indicated that processes at the soil/solution interface may have contributed to reduce atrazine sorption. In contrast, enhanced atrazine sorption in the presence of DOM extracted from composted-SS indicated atrazine was bound by DOM associated with the soil. Atrazine desorption from soil increased in the presence of DOM from all four sludges; however, DOMs had little effect on atrazine desorption from sludge and from sludge-amended soil. Interactions of soil surfaces with organic amendments and their DOM are shown in this work as a major process determining atrazine sorption-desorption in amended soil.

## ARI

E. Madejon, E. Galli y U. Tomati

**Bioremediation of olive mill pomaces for agricultural purposes**

Revista: Fresenius Environmental Bulletin
Editor: Birkhäuser Velag
Volumen: 0 ISSN: 1018-4619
Paginas: 0 - 0 Ciudad: Basilea, Suiza
Incluido en SCI: Sí

**Resumen.-** Existing laws in Italy propose olive mill pomaces (OMP), produced by the two phase system, as a soil amendment. The direct supply of such a raw material poses some problems due to the rainy season and its phytotoxicity. The bioremediation of olive mill pomaces can be an useful and economic technology to overcome those backdowns. Bioremediation has been performed in a forced aerated static pile, mixing OMP with chopped wheat straw in the ratio 10:1 w/w. 2% urea was added to the mixture to ensure a C/N ratio of about 40. During the process moisture content, pH, EC, organic carbon, nitrogen and phytotoxicity were determined.

The thermophilic phase lasted 60 days, reaching its maximum value of 71°C betwen 24 and 32 days. During thermophilic phase the moisture content was maintained at an average value of 60%.

The pH increased from 7.20 to a maximum of 8.53 after 48 days of composting. Afterwards the pH decreased to 7.5 during maturity. The EC value remained approximately constant during the process. The final product has been examined to determine its physical, chemical and biological characteristics. At the end of the process a C/N = 31 was determined. This high value depends on the presence of the grinded stones, harldy to be microbiologically degraded.

## ARI

E. Madejon, E. Galli y U. Tomati

**Composting of wastes produced by new olive mill technology**

Revista: Agrochimica
Editor: Istituto Chimica Agraria

Volumen: 42 ISSN: 0002-1857
Paginas: 135 - 146 Ciudad: Pisa, Italia
Incluido en SCI: Sí

**Resumen.-** Olive mill pomace (OMP) produced by the two phase system were composted with chopped wheat straw in a forced aerated static pile. 2% urea was added to the mixture to ensure a C/N ratio of about 35-40. During the process temperature, oxygen consumption, moisture content, pH, electrical conductivity (EC), total organic carbon (TOC), total extractable carbon (TEC), humic and fulvic acids, nitrogen, C/N, phenols, lipids and lignin were determined. Urease and casein-hydrolysing protease activities were also assayed. The process exhibited the typical succession of mesophylic, thermophylic and maturation phases usually recorded for the Rutgers system.

The humification was assayed following the degree of humification, the humification rate and the humification index which respectively reached the values of 0.12, 89% and 15% during the maturation phase. Humic acids were characterized by their elemental composition.

The final product was examined to determine its physical, chemical and biological characteristics. The analyses revealed the presence of considerable amounts of mineral nutrients and stabilized organic matter and absence of harmful levels of heavy metals. The phytotoxicity disappeared at the end of the thermophilic phase.

## ARI

Cantos, M.; Cuerva, J.; Zárate, R. y Troncoso, A.

**Embryo rescue and development of Juniperus oxycedrus and macrocarpa.**

Revista: Seed Science and Technology.
Editor: D. Wordsworth
Volumen: 26 ISSN:
Paginas: 193 - 198 Ciudad: Cambridge, Reino Unido
Incluido en SCI: Sí

**Resumen.-** Germination of intact seeds, seeds without testa and isolated embryos of two subspecies of Juniperus oxycedrus (oxycedrus and macrocarpa) was compared both in vitro and under greenhouse conditions (for intact and seeds without testa). Intact seeds did not germinate in the greenhouse or in vitro. Seeds without testa did not germinate under greenhouse conditions, although these showed a low response in vitro (12%) on 1/3 strength of Murashige and Skoog medium with 3% sucrose with and without 0.5 g l-1 of GA3. However, isolated embryos in vitro reached germination levels of about 50% on the same media, providing a promising method for improving germination and propagation of Juniperus oxycedrus. Acclimatization of plantlets in soil under greenhouse conditions was very successful. The survival rate was 80% and the average plant height after one year was 20 cm.

## ARI

Cantos, M.; Zárate, R.; Troncoso, A.

**In vitro germplasm conservation of Atropa baetica by cold storage.**

Revista: Botanic Gardens. Micropropagation News.
Editor: Margaret M. Ramsey
Volumen: 2(3) ISSN: 0962-7448
Paginas: 37 - 40 Ciudad: Oxford, Reino Unido
Incluido en SCI: No

**Resumen.-** A germplasm of Atropa baetica in vitro derived plantlets was maintained by cold storage at 4°C in darkness for six months. The response of the cold stored germplasm to growing culture conditions was studied on Murashige & Skoog medium supplemented with BAP (0.66 mg l-1), NAA (0.24 mg l-1), inositol (100 mg l-1), thiamine (1 mg l-1) and 3% sucrose during a six month period. The survival rate of the germplasm was similar to the control (plant material grown under normal culture conditions), with an average percentage of 97.9 over the six month period. The number of buds produced was similar for both control and cold stored germplasm with an average 4.53 buds per explant during the six month period. Similarly, the number of shoots per explant did not differ between control and treatment. On the other hand, shoot length of cold stored germplasm was statistically shorter only for the 1st and 5th month; however, the overall six month measurements showed no difference.

## ARI

Cox, L. Koskinen, W.C. y Yen P.Y.

**Changes in imidacloprid sorption with incubation time**

Revista: Soil Sci. Soc. Am. J.
Editor: ASA, SSSA
Volumen: 62 ISSN: 0367-5995

Paginas: 342 - 347 Ciudad: Madison, EE.UU.
Incluido en SCI: Sí

**Resumen.-** Changes in sorption of the insecticide imidacloprid (1-[(6-chloro-3-pyridinyl)-methyl]-N-nitro-2-imidazolidinimine) with aging in three soils have been determined. Soil moisture was adjusted to -33 KPa and 14C- and analytical-grade imidacloprid added to the soil at a rate of 1 mg kg-1. Imidacloprid spiked soils were incubated at 25 oC for 16 weeks. Replicate soil samples were periodically extracted successively with 0.01 N CaCl2, acetonitrile, and 1 N HCl. Sorption, as indicated by Kd values, was higher in the soil with highest OC content and increased during the incubation period by a factor of 3. This increase is due to the decrease in the imidacloprid extractable with CaCl2 (soluble phase) and the increase in the amount of imidacloprid extractable with acetonitrile and HCl (sorbed phase) with incubation time. Results should be taken into account when extrapolating sorption data to mathematical models of pesticide leaching.

# Artículos en revistas nacionales (ARN)

## ARN

Murillo, J.M.; Díaz, M.J.; Cabrera, F. y López, R.

**Nitrogen-salt interaction in ryegrass. Implications for soil potassium testing**

Revista: Investigación Agraria: Producción y Protección Vegetales

Editor: Inst. Nac. Inv. Tecnol. Agrar.

Volumen: 13 ISSN: 0213-5000

Paginas: 129 - 138 Ciudad: Madrid, España

Incluido en SCI: No

**Resumen.-** Split additions of NO3-N (irrigation with a solution of 50 mg N l-1) under saline conditions (irrigation with a 10 mM NaCl solution, which did not negatively affect plant growth) and non-saline conditions (water), enhanced the Na uptake by Italian ryegrass (Lolium multiflorum Lam. cv. 'Barwoltra') grown in two soils potentially rich in K. The Mg uptake was also enhanced. This was not observed for split additions of P. After an initial 'luxury' K plant uptake, the K supply could be insufficient to cope with the vigorous growth of the ryegrass resulting from the addition of NO3-N, so that K was partially replaced by Na (and Mg) for achieving plant growth in treatments adding N.

KEY WORDS: Italian ryegrass, Nutrients, Salinity, Soil K.

## ARN

Bellinfante, N.; Cantos, M.; Salas, E.; Troncoso, A.

**Influencia del fosfato monopotásico en el desarrollo y estado nutritivo de plantas de vid Garrido fino cultivadas in vitro.**

Revista: Viticultura y Enología Profesional.

Editor: Agro Latino, S.L.

Volumen: 59 ISSN: 1131-5679.

Paginas: 13 - 19 Ciudad: Barcelona, España

Incluido en SCI: No

**Resumen.-** La variedad de vid Garrido fino, predominante en la comarca del Aljarafe (Sevilla), y apreciada por la calidad de sus mostos, se encuentra en descenso de superficie cultivada. Para poder acceder a un elevado número de plantas en poco tiempo se ha empleado con éxito la técnica de micropropagación, destacando los trabajos realizados por algunos autores del grupo en la optimización de soluciones nutritivas para aumentar el rendimiento de esta técnica en la obtención de otras variedades de vid. La escasa respuesta puesta de manifiesto por esta variedad al micropropagarla con estos medios, ha sugerido la optimización de éstos, cambiando las dosis de fósforo y potasio aplicadas, así como la naturaleza del soporte de cultivo.

Como resultado de la investigación se propone una nueva formulación optimizada para el medio de nutrición, así como se sugiere el uso de arena silícea inerte como soporte de cultivo.

## ARN

A. Rodríguez; J. Rodríguez; L. Cáceres; L. Clemente; M. Cantano; G. Belluomini y L. Manfra.

**Evolución de la costa atlántica onubense (SO España) desde el máximo flandriense a la actualidad.**

Revista: Bol. Geol. y Min. de España

Editor:

Volumen: 108, 4 ISSN: 0366-0176

Paginas: 137 - 147 Ciudad: Madrid, España

Incluido en SCI: No

# Libros completos (LBA)

## LBA

L. Clemente; L.V. García y P. Siljeström
**Los suelos del Parque Nacional de Doñana**
Libro: Libro
Editor: Ministerio de Medio Ambiente
Volumen: 0
Paginas: 1 - 206
Incluido en SCI: No
ISBN: 84-8014-244-8
Ciudad: Madrid, España

# Capítulos de libros (CLI)

## CLI

F. Moreno, J.E. Fernández, M.J. Palomo, I.F. Girón, J.M. Villau, A. Diaz-Espejo

**Measurements of soil hydraulic properties in an olive orchard under drip irrigation**

Libro: Water and the enviroment: Innovation Issues in Irrigation and Drainage

Editor: Luis S. Pereira and John W. Gowing / E & FN SPON

Volumen: 1 ISBN: 0-419-23710-0

Paginas: 390 - 395 Ciudad: Londres, Reino Unido

Incluido en SCI: No

**Resumen.-** The increase of process modelling of water balance in irrigation and tillage experiments has imposed a demand of accurate measurements of the hydraulic properties of soils. Under drip irrigation, the spatial distribution of water content, and the wetted soil volume are controlled by the hydraulic properties of the soil top layers.

The objective of this work was to determine in situ the hydraulic conductivity and sorptivity, in the range near saturation, of the soil of an olive orchard with drip irrigation. These provide data to predict the extension of the wetted zone into the soil, and thus to manage drip irrigation in a better way.

Experiments were carried out on a 1 ha plot within an olive orchard with drip irrigation. The soil of the plot is a sandy loam Xerochrept. A tension-disc infiltrometer of 125 mm radius was used to determine in situ the hydraulic conductivity and the sorptivity in the range near saturation. Several sites were chosen within the plot to measure the infiltration at different pressure potentials (y0). Measurements were conducted in each site at the soil surface and the depth of the plough pan. Hydraulic conductivity and sorptivity were obtained using the mono-disc multiple-head method, [1].

The hydraulic conductivity of the soil surface layer showed relatively high values (0.030 mm s-1) for y > -10 mm, and decreased with the decrease of y. The sorptivity followed a similar pattern. In contrast, the hydraulic conductivity values at the depth of the plough pan layer was lower than those of the surface (0.014 mm s-1 for y > -10 mm). The variability of the hydraulic conductivity and sorptivity of the soil surface layer was relatively low, the coefficients of variation being always lower than 30%. For the plough pan layer the variability was much higher (coefficients of variation were between 40% and 60%).

## CLI

M.M. Ridao, F. Moreno, F. Cabrera, J.E. Fernández, M.J. Palomo, E. Fernández-Boy

**Effect of irrigation with saline water on soil and crop in south-west Spain**

Libro: Water and the enviroment: Innovation Issues in Irrigation and Drainage

Editor: Luis S. Pereira and John W. Gowing / E & FN SPON

Volumen: 1 ISBN: 0-419-23710-0

Paginas: 58 - 65 Ciudad: Londres, Reino Unido

Incluido en SCI: No

**Resumen.-** The drained and irrigated marshes of the Guadalquivir river (SW Spain) are formed on soils of high clay content (about 70%), high salinity, and a shallow, extremely saline, water table. Irrigation is necessary for successful crop production in this region of low and variable rainfall. In some years, however, water supply for irrigation is limited due to drought periods. The scarcity of water of good quality during the drought period 1993-1995 imposed on farmers the necessity to irrigate with river water, which at this location is of high salinity due to tidal flow.

The objective of this work was to evaluate the effects of irrigation with water of high salinity on soil properties and growth and yield of cotton crop.

The experiments were carried out during 1997 in a farm plot of 12.5 ha (250 m x 500 m) in which a drainage system had been installed. Two subplots of 0.5 ha (20 m x 250 m) each were selected. Cotton was growing on both subplots, and irrigation was applied by furrows. One subplot was irrigated with water of good quality during the whole season, while in the other subplot one of the irrigations (at flowering stage) was with water of high salinity. Several measurement sites were situated in each subplot. Water content profile, tensiometric profile, water table level, drainage water flow, soil salinity, leaf water potential, stomatal conductance, and crop development and crop yield were monitored.

The results showed that after the irrigation with saline water, the soil salinity increased. This increase was more noticeable in the top layer (0-30 cm depth). In contrast, for the same dates, the soil of the subplot irrigated with non-saline water showed no changes. After five irrigations with water of good quality, the salinity of the soil in the subplot irrigated with saline water reached values similar to those before the application of saline water. The irrigation with saline water affected crop development. Plant height, leaf area index, leaf water potential and stomatal conductance were lower than on the subplot irrigated with non-saline water. Despite these negative effects on crop development and water status in plants, the crop yield was the same as on the subplot irrigated with non-saline water.

## CLI

Palomo MJ, Díaz-Espejo A, Fernández JE, Girón IF and Moreno F

**Using sap flow measurements to quantify water consumption in the olive tree**

Libro: Water and the Environment
Editor: Pereira LS and Gowing JW / E & FN Spon
Volumen: 0 ISBN: 0-419-23710-0
Paginas: 205 - 212 Ciudad: New York, EE.UU.
Incluido en SCI: No

**Resumen.-** We used the compensation heat-pulse technique to measure sap flows in 28-year-old olive trees, in order to determine their transpiration fluxes in real time. Measurements were made in irrigated and non-irrigated trees. Evaporation from the soil was estimated on days of high atmospheric demand by using an empirical equation obtained for the orchard conditions. Crop evapotranspiration was then determined from daily data of transpiration and evaporation ($ET_c$-2). Results were compared with the crop evapotranspiration ($ET_c$-1) calculated from the potential evapotranspiration ($ET_o$) in the area, corrected by reduction coefficients ($K_c$ and $K_r$). Our aim was to carry out a preliminary study of a new method for calculating crop evapotranspiration, designed to avoid the errors derived from the scarce information on $K_c$ and $K_r$, and for the lack of temporal resolution in the calculation of $ET_o$. For irrigated trees, $ET_c$-2 was 80% of $ET_c$-1. For non-irrigated trees, $ET_c$-2 was only 43% of $ET_c$-1, due to the lack of water in the soil. A good agreement between transpiration fluxes and environmental conditions was observed.

## CLI

Marañón, T. y J.F. Ojeda

**Ecology and history of a wooded ladscape in southern Spain**

Libro: The ecological history of European forests
Editor: CAB International
Volumen: 0 ISBN: 0 85199 2560
Paginas: 107 - 116 Ciudad: Wallingford, Reino Unido
Incluido en SCI: Sí

**Resumen.-** An extensive oak woodland, of about 1,000 km2, dominated by evergreen cork oak (Quercus suber) and semideciduous Q. canariensis, is found in southern Spain, near the Strait of Gibraltar, and contrasts with the paradigm of deforested Mediterranean mountains. Several factors, ecological, geographical and historical, have contributed to the origin and maintenance of this forested landscape. The rough relief and the acidic, nutrient-poor soils (derived from Oligo-Miocene sandstone) made this area unsuitable for cultivation. The oceanic influence favours the growth of oak trees. In particular, the cork oak is well suited to acidic soils and the humid Mediterranean climate. Three historical milestones seem relevant to the preservation of this woodland. Its location at a frontier during medieval times (thirteen to fifteenth centuries) discouraged villages and reduced the human pressure on the woodland resources. The rise of the value of cork helped to preserve the cork oak woodlands during early nineteenth century industrial times. Contemporary consciousness about the conservation of woodland landscapes (relatively unusual in the Mediterranean region) led to their designation as Los Alcornocales (meaning "The cork oak woodlands") Natural Park, devoted to the eco-development of the region.

## CLI

Fernando Madrid, Manuel J. Trasierra, Rafael López, José M. Murillo and Francisco Cabrera.

**Municipal solid waste compost utilization in greenhouse- cultivated tomato**

Libro: Acta Horticulturae
Editor: International Society for Horticultural Science
Volumen: 469 ISBN: 90-6605-880-3
Paginas: 297 - 304 Ciudad: Brujas, Bélgica
Incluido en SCI: No

**Resumen.-** The effects of a municipal solid waste compost (MSWC) (from Villarrasa-Huelva-Spain) on growth, yield and mineral composition of tomato plants (Lycopersicon esculentum Miller, cv. Genaro) were studied. Results were compared with those observed both without the application of organic matter (Control) and with tha application of a commercial compost AC (made from sheep manure). Soils of the three treatments also received N, P and K as a deep mineral fertilization (181 kg ha-1 N, 22 kg ha-1 P2O5, 108 kg ha-1 K2O). The experiment was carried out in a greenhouse using a sandy soil and drip irrigation. The fertigation for all the treatments during the season was the usual one of the farmers of the region (120 kg ha-1 N, 20 kg ha-1 P2O5, and 60 kg ha-1 K2O per week).

Treatments MSWC (21000 kg ha-1 dry weight; <10 mm, OM 26%, N 0.60%, P2O5 0.62%, K2O 0.55%) and AC (5000 kg ha-1 dry weight; OM 52%, N 3.47%, P2O5 0.50%, K2O 2.39%) increased the concentrations of K, Ca and Mg in tomato leaves and fruits, giving rise to higher EC values in the juice fruit. However, no effect of the organic treatments was observed in N and P contents of leaves and fruits. Mean fruit weight and yield increased noticeably in treatment AC (204 g; 104.6 Mg ha-1), while increasing only slightly in MSWC (180 g; 92.3 Mg ha-1) in comparison with the Control (166 g; 90.7 Mg ha-1).

## CLI

R. López, C. Durán, J.M. Murillo y F. Cabrera

**Geranium's response to compost based substrates**

Libro: Acta Horticulturae

Editor: International Society for Horticultural Science.

Volumen: 469 ISBN: 90-6605-880-3

Paginas: 255 - 262 Ciudad: Brujas, Bélgica

Incluido en SCI: No

**Resumen.-** The effects of compost based substrates on growth and nutrition of geranium (Pelargonium zonale cv F2 Lucky Break) were investigated. Five substrates (treatments) were used: MC (Naturplant, Fertilizantes Orgánicos Melguizo SL, a commercial substrate for domestic use, made up of composted manure, MC, and cotton trash); MC2WP1 (a mixture of MB and a white peat, WP, with a 2:1 volumetric ratio; MC1PB1 (a mixture of MC and aged pine bark, PB, with a particle size <10mm with a volumetric ratio 1:1); MC1MSW1WP1 (mixture of MC, a composted municipal solid waste, MSW, with a particle size <10mm, and WP with a volumetric ratio of 1:1:1; and CP (Composana, CP, a commercial substrate made up of mineral fertilizer supplemented peat). Eight 1l pots were filled with each one of the substrates. One plant was cultivated per pot, in greenhouse, under reduced irrigation and without any additional fertilization (following the usual practice at home).

After 45 days, four plants of each treatment were used for the measurements of weight. Growth parameters (height and weight) followed the pattern: CP @ MC2WP1 > MC > MC1MSW1WP1 > MC1PB1. Plants cultivated in MC1PB1 showed levels of N in leaf under the deficiency limit, probably due to N immobilisation or to incomplete composting of PB. Plants from MC and MC1MSW1WP1 showed the lowest levels of P. Plants from MC-based substrates showed higher K and lower Ca and Na concentrations than plants cultivated in CP, due to K-Ca and K-Na antagonisms.

From the day 45th on, pots (four pots per treatment) were irrigated with a NH4NO3 solution (150 mg N/l). At the day 100th, the growth pattern was the following: CP @ MC1PB1 @ MC2WP1 @ MC > MC1MSW1WP1. Leaf concentration of N and P were similar for all the treatments, showing that N-fertilization favours P-uptake or -mineralization from MC and MC1MSW1WP1. Lowest development of MC1MSW1WP1 plants could be related to MSW compost immaturity.

These results suggest that MC-based substrates (with or without peat and pine bark) coul be advantageously utilized for domestic use with minor modifications (supplementation with N- or/and P-fertilizer).

## CLI

Troncoso, A.

**Nutrición mineral del olivo.**

Libro: L'Olivicoltura Mediterranea verso il 2000. (International Course of Olive Growing)

Editor: Cimato, A.; Baldani, A. (C.O.I)

Volumen: ISBN:

Paginas: 185 - 196 Ciudad: Scandicci, Italia

Incluido en SCI: No

**Resumen.-** El libro recoge las distintas conferencias habidas en el International Course on Olive Growing que organizado por el COI, CNR, Regione Toscana y Commune de Scandicci tuvo lugar en Scandicci (Florencia) en mayo de 1996. En el capítulo sobre la nutrición mineral, el autor después de describir el papel de los diferentes nutrientes sobre el metabolismo de la planta, señala el empirismo que aun existe en el cultivo del olivo en relación al suplemento natural dado al suelo y los problemas reales de la contaminación del suelo. El autor da la relación de la literatura internacional existente al respecto, mostrando los mecanismos de absorción de nitrógeno nítrico y amónico. Sobre la relación entre estos dos compuestos el anticipa las conclusiones de las investigaciones llevadas a cabo en España, que proeban que solo una concentración equilibrada de nitrógeno nítrico y amoniacal en el suelo, puede garantizar la duración de esta aplicación a las raíces, favoreciendo una mejor absorción y mayor productividad.

## CLI

Antonio Troncoso, Ana Pérez, Manuel Cantos, Juana Liñán

**Germinación de semillas y embriones de olivo**

Libro: Revista de Ciências Agrarias

Editor: Sociedade de Ciências Agrárias de Portugal

Volumen: XXI ISBN: 0871-018X

Paginas: 57 - 64 Ciudad: Lisboa, Portugal

Incluido en SCI: No

**Resumen.-** Se estudia la germinación de las variedades de olivo Picual, Arbequina, Galego y Gordal. Con las tres primeras se comparan tres procedimientos de reproducción: Germinación de huesos (semillas con endocarpo leñoso), semillas (sin endocarpo) y embriones aislados y cultivados in vitro. Con el Gordal, debido a la dificultad de la germinación de los huesos, sólo se emplearon las semillas y los embriones.

Los huesos necesitaron casi un año para obtener el 80%, 58% y 20% de plántulas respectivamente en los cv Picual, Galego y Arbequina. Con la semilla sin endocarpo, el período medio entre la siembra y la formación de la plántula fue de unos 45 días, con germinaciones de 76% (Picual) y 64% (Arbequina y Galego). Es decir, se acortó muy significativamente el tiempo de germinación y se mantuvo o mejoró la germinabilidad (cv. Arbequina). La variedad Gordal presentó peores resultados, ya que sólo alcanzó un 45% de plántulas viables y además el proceso de germinación duró 330 días El cultivo de embriones in vitro no obstante ser una técnica mas difícil y costosa bajó el tiempo de germinación a 10 días y elevó el índice de germinabilidad casi al 100% en todos los cultivares ensayados. Sin embargo mientras Picual, Arbequina y Galego alcanzaron una producción final de plántulas del 90%., los embriones de la variedad Gordal solamente resultaron viables en un 45%.

## CLI

Troncoso, A.; Liñán, J.; Cantos, M. y Fernández, J.E.
**Fertirrigación**
Libro: El cultivo del olivo (2° Ed. revisada y ampliada)
Editor: Mundi Prensa
Volumen: ISBN: 84-7114-707-6
Paginas: 281 - 306 Ciudad: Madrid, España
Incluido en SCI: No

**Resumen.-** En esta segunda edición donde se corrige y aumenta la anterior, se ofrecen datos obtenidos de nuevos estudios sobre las ventajas e inconvenientes de la fertirrigación, se estudia el movimiento de nutrientes en el bulbo de riego, así como la calidad del agua. Se profundiza en el manejo de la fertirrigación, fundamentalmente en los tipos de abono y las precauciones a tomar para su uso, depósitos y sistemas de inyección de los mismos, prevención de obturaciones y programación de la fertirrigación.

## CLI

F. Moreno
**Estado, Flujo y Ciclo del Agua en el Suelo (capítulo 9)**
Libro: Agricultura Sostenible
Editor: Agrofuturo, Life y Ediciones Mundi-Prensa
Volumen: 1 ISBN: 84-7114-718-1
Paginas: 197 - 212 Ciudad: Madrid, España
Incluido en SCI: No

## CLI

E.O. Leidi, J. Gorham
**Salt and water stress-tolerant cotton**
Libro: Biotechnology in Agriculture and Forestry - Cotton
Editor: Y.P.S. Bajaj, Springer
Volumen: 42 ISBN: 0934-943X
Paginas: 227 - 242 Ciudad: Berlin, Alemania
Incluido en SCI: No

# Artículos en revistas de divulgación (ADV)

## ADV

Pablo Arambarri
**Veinte Años de Investigaciones Alrededor de Doñana**
Revista: Arbor
Editor:
Volumen: 634 ISSN:
Paginas: 193 - 207 Ciudad:
Incluido en SCI: No

**Resumen.-** La rotura de la balsa de decantación de lodos de la Empresa Boliden-Apirsa en Aznalcóllar, ha demostrado que el Parque Nacional de Doñana está indefensoante accidentes de gran calibre, que deben prevenirse. Doñana no puede permanecer aislada ni ajena al territorio que la rodea, pero sí debe estar protegida por suficientes medios descontaminantes, sistemas de alarma en tiempo real, planes de emrgencia operativos y estudios y proyectos I+D como sean necesarios para evitar percances como el ocurrido, que ponen en peligro su propia existencia.v

## ADV

Fernández JE, Díaz-Espejo A, Palomo MJ, Girón IF y Moreno F
**Riego y fertilización del olivar en la comarca de El Aljarafe**
Revista: Monografía
Editor:
Volumen: 0 ISSN:
Paginas: 1 - 32 Ciudad: Sevilla, España
Incluido en SCI: No

## 3.1.2. Otras Publicaciones

### Memorias (MEM)

### MEM

F. Martín, R. López, I. García, M. Capitán, F. Cabrera y M. Roca.
**Niveles de nitrato en peciolos**
Libro: Memoria proyecto C-97-012. Consejería de Agricultura y Pesca. Junta de Andalucía
Editor:
Volumen: 0 ISBN:
Paginas: 77 Ciudad: Sevilla, España
Fecha de publicación: 15/10/1998

### MEM

L. Clemente; L.V. Garcia; T. Marañon; J. Rodriguez; L. Caceres; F. Alonso y F. Ojeda
**Estudio del Medio Fisico y Vegetacion de las Islas Chafarinas**
Libro: Libro
Editor:
Volumen: ISBN:
Paginas: 1 - 254 Ciudad: Sevilla, España
Fecha de publicación: 02/12/1998

## Informes y otros (INF)

### INF

C. Saiz-Jimenez

**Estudio de los procesos de alteración de las rocas y pinturas de los abrigos de Cueva de la Graja y Cueva del Encajero**

Informe: Informe para la Consejería de Cultura de la Junta de Andalucía, 111 p
Editor:
Volumen: ISSN:
Paginas: 1 - 111 Ciudad: Sevilla, España
Fecha de publicación:

### INF

R. López, J.M. Murillo, F.J. González Vila, F. Madrid y F. Cabrera.

**Estudio sobre la producción y utilización de compost de RSU**

Informe: Informe nº 4 (final). AMA, Junta de Andalucía
Editor:
Volumen: 0 ISSN:
Paginas: 223 Ciudad: Sevilla, España
Fecha de publicación: 30/06/1998

# Trabajos completos en actas de congresos internacionales (PCI)

## PCI

F. Moreno, E. Fernández-Boy, F. Cabrera, J.E. Fernández, M.J. Palomo, I.F. Girón, B. Bellido

**Irrigation with saline water in the reclaimed marsh soils of south-west Spain: Impact on soil properties and cotton crop**

Libro: Proceedings of the International Workshop on the Use of Saline and Brackish Water for Irrigation

Editor: R. Ragab and G. Pearce

Volumen: 1 ISBN:

Paginas: 51 - 58 Ciudad: Bali, Indonesia

**Resumen.-** The drained and irrigated marshes in south-west Spain are formed on soils of alluvial origin from the ancient Guadalquivir river estuary. The most important characteristics of these soils are the high clay content (about 70%), high salinity, and a shallow, extremely saline, water table. The reclaimed area near Lebrija, called Sector B-XII (about 15000 ha), has been under cultivation since 1978. Irrigation is necessary for successful crop production in this region of low and variable rainfall. Drainage is also required to ensure that the highly saline water table does not encroach into the root zone. In some years, however, water supply for irrigation is limited due to drought periods. The scarcity of good quality water during the drought period 1993-1995 imposed on farmers the necessity to irrigate with river water, which at this location is of high salinity due to tidal flow.

The objective of this work was to evaluate the effects of irrigation with water of high salinity on soil properties and growth and yield of cotton crop. The results provide data for the management of irrigation with saline water and for sustainability of agriculture in periods of water scarcity in the area.

The experiments were carried out during 1997 in a farm plot of 12.5 ha (250 m x 500 m) in which a drainage system had been installed, consisting of cylindrical ceramic sections (30 cm long) forming pipes 250 m long, buried at a depth of 1 m and spaced at intervals of 10 m. These drains discharge into a collecting channel perpendicular to the drains. Two subplots of 0.5 ha (20 m x 250 m) each were selected. Cotton was growing on both subplots, and irrigation was applied by furrows. One subplot was irrigated with good quality water during the whole season, while in the other subplot one of the irrigations (at flowering stage) was with water of high salinity. Several measurement sites were situated in each subplot. Water content profile, tensiometric profile, water table level, drainage water flow, soil salinity, and crop development and crop yield were monitored.

The results showed that after the irrigation with saline water, the soil salinity increased. This increase was more noticeable in the top layer (0-30 cm depth). In contrast, for the same dates, the soil of the subplot irrigated with non-saline water showed no changes. After five irrigations with water of good quality, the salinity of the soil in the subplot irrigated with saline water reached values similar to those before the application of saline water. The irrigation with saline water affected crop development. Cotton growth was reduced in comparison with that on the subplot irrigated only with water of good quality. Plant height was lower than on the subplot irrigated with non-saline water. Despite this negative effect on crop development, the crop yield was the same as on the subplot irrigated with non-saline water.

## PCI

F. Moreno

**Soil salinity in Spain and its impact on agriculture: Research activities carried out by the group of IRNAS**

Libro: Proceedings of the First Trans-National Meeting "Salinity as a Limiting Factor for Agricultural Productivity in the Mediterranean Basin

Editor: A.P. Leone and P. Steduto

Volumen: 1 ISBN:

Paginas: 43 - 54 Ciudad: Napoles, Italia

**Resumen.-** This review presents the problem of soil salinity in Spain, and the works carried out by the group of IRNAS on the influence of irrigation on properties of reclaimed salt-affected soils of the marshes of the Guadalquivir river valley (south-west Spain).

The salinity problem affects soils of different areas in Spain. In most of the main areas with salt-affected soils the salinity was developed due to natural conditions, like the existence of materials that produced soluble salts in some cases, and the presence of a shallow very saline water table in other cases. In other parts of Spain the salinity problem was associated with the change in land use, like the transformation from rainfed agriculture to irrigated agriculture. This is the case of an important area of the Ebro river valley (north-east Spain). At the present, the salinization of soils in Spain can be due to the increasing irrigated areas if the irrigation is conducted with a non appropriate management. In reclaimed salt-affected soils an adequate management of the irrigation is necessary to avoid problems of resalinization, particularly in years in which the available water for irrigation is reduced due to shortage of precipitation.

The group of IRNAS is working since several years on soil salinity and irrigation of reclaimed salt-affected soils in the marshes of the Guadalquivir river valley (south-east Spain). The most important works done by this group are related with the

physical and chemical properties of these soils under different land uses, the influence of irrigation and drainage on soil properties and crop development, and the use of simulation models to predict the water and salt balance under different irrigation strategies.

## PCI

Gutiérrez A., del Río J.C., Martínez M.J. and Martínez A.T.

**Analyses of acetone extracts from eucalypt wood, pitch deposits and biologically-pretreated wood**

Libro: Biotechnology in the Pulp and Paper Industry

Editor: Publication Clerk

Volumen: A ISBN: 1-896742-34-3

Paginas: 59 - 62 Ciudad: Montreal, Canadá

**Resumen.-** Pitch deposits occurring in eucalypt pulp and pulp mills have been characterized by GC and GC-MS. Sterols, sterol esters, fatty acids, steroid ketones, hydrocarbons and waxes were the main compounds identified. These chemical species arise from eucalypt wood extractives that survive the pulping and bleaching processes and hence may deposit and accumulate in pulp and on different parts of the mill. Solid-state fermentation of wood with different fungi was investigated as a pretreatment to decrease the content of the compounds responsible for pitch deposition.

## PCI

Martínez M.J., Barrasa J.M., Gutiérrez A., del Río J.C., and Martínez A.T.

**Biological depitching of eucalypt wood with Ascomycetous and Basidiomycetous fungi**

Libro: Biotechnology in the Pulp and Paper Industry

Editor: Publication Clerk

Volumen: B ISBN: 1-896742-35-1

Paginas: 37 - 40 Ciudad: Montreal, Canadá

**Resumen.-** To evaluate biotechnological solutions to eliminate problematic pitch from Eucalyptus globulus wood, a screening of 73 fungal species (included 35 strains from fungi growing Eucalyptus wood, bark or resin) was carried out under solid-state fermentation conditions. The chromatographic analysis confirmed that some of them removed or decrease those compounds presumptly responsible for pitch deposition in pulp (namely sitosterol esters of fatty acids and free sterols). The most promising strains are being assayed in larger-scale experiments in collaboration with ENCE (Spain).

## PCI

Murillo, J.M.; Cabrera, F.; López, R. y Vázquez, B.

**Humic amendment derived from 'alpechin' compost. A worthwhile liquid organic fertilizer**

Libro: Proceedings of the 16th World Congress of Soil Science

Editor:

Volumen: CD-ROM ISBN:

Paginas: 1 - 7 Ciudad: Montpellier, Francia

**Resumen.-** The present study deals with the effect of a liquid humic amendment (30% total humic extract: FERTIORMONTâ), obtained from an 'alpechín' compost, on growth and nutritional status of Lolium multiflorum Lam. cv. Tewera, and on selected soil properties. 'Alpechín' is the olive vegetation water from the olive oil processing industry. Dried sludge resulting from the evaporation of 'alpechín' is often composted with other agricultural by-products. A liquid humic amendment may be also obtained from this compost by further moistening and fermentation. The assay was carried out using pots and the first horizon of a XEROCHREPT as a substrate. A complex 15N-15P2O5-15K2O inorganic fertilizer was mixed with the soil to establish four fertilizing treatments: irrigation with deionized water (inorganic fertilizer treatment, IF), and irrigation with solutions of water/Fertiormont at ratios of 1/200, 1/100 and 1/25 (LF, MF and HF treatments, respectively). Soil without any fertilizer was used as a control (treatment C). Three replicates per treatment, randomly arranged in a complete block design, were established. After the last ryegrass harvest, a germination bioassay for cress (Lepidium sativum L.) and ryegrass was set up using the soil of each treatment.

Total dry matter production of the ryegrass for the HF treatment was significantly higher than that for the other treatments. HF treatment yielded the highest above-ground export of nutrients and it led to a synergism in the absorption of N, K and Mn, (and Zn in the 3rd cut), since their concentrations and accumulations increased parallely to a biomass increase. This treatment also caused significant increases relative to the other treatments in soil concentration of organic matter, N, P, K and DTPA-extractable Fe and Mn. Significant increases, compared with C and IF treatments, were also observed for phosphatase, arylsulphatase, b-glucosidase and dehydrogenase activities. Despite the increase in soil electrical conductivity caused by the HF treatment, germination and main root length of Lepidium and ryegrass were not affected.

Key words: humic amendment, ryegrass growth, nutrients, soil properties

Mots clés: épandage humique, ryegrass, croissance, nutrition, propiétés du sol

## PCI

F. Cabrera, E. Madejon, R. López y J.M. Murillo.

**Agricultural use of three (sugarbeet) vinasse composts: effect on selected soil chemical properties.**

Libro: Proceedings of the 16th World Congress of Soil Science

Editor:

Volumen: CD-ROM ISBN:

Paginas: 1 - 7 Ciudad: Montpellier, Francia

**Resumen.-** Direct agricultural application of vinasse (a high-density liquid waste derived from the sugarbeet industry) is constrained by of its high salinity (EC, 280 dS m-1; Na, 2.8%). Co-composting of vinasse with other agricultural residues could lessen these disadvantages. Three mixtures of vinasse and other residues were co-composted in static windrows with forced aeration for four months. The initial composition of each of the mixtures was: (i) 82% grape-marc and 18% vinasse (compost G); (ii) 76% olive pressed cake, 17% vinasse and 6% leonardite (compost O); and (iii) 47% cotton gin trash, 49% vinasse and 3% leonardite (compost C). A field experiment was carried out to study the effect of these three beet-vinasse composts (treatments G, O and C) on selected properties of a XEROCHREPT soil (arable layer, 0-30 cm) after two years of application under irrigation. Results were compared with those obtained using an inorganic fertilizer (treatment IF) and without any fertilization (treatment control). Four replicates (5 x 7.5 m each) were used for each treatment. Corn and sugarbeet were cropped during the first year and second year respectively.

Soil pH did not show significant variations due to treatments in either year. Soil EC values were higher in compost and inorganic fertilizer treatments than in the control, although a significant difference with the control was observed only after the second year for treatment C. After both compost applications, oxidizable-C content of the soil increased significantly, relative to the control. Significant increases of the total humic extract (THE) content of the soil, relative to the control, as a consequence of the organic and mineral fertilizations, were also recorded, although THE values were significantly higher in the soils treated with composts than in that treated with IF. The humic acid (HA) content of soils showed a consistent, significant increase following the application of compost G and, especially, of compost O, while compost C increased HA significantly only after the second year of application, and no effect of IF was detected. In contrast, the application of IF, besides those of composts G and C, significantly increased the fulvic acids (FA) content of the soils, relative to the control. The organic and mineral fertilizations increased the Kjeldahl-N content of the soil although differences relative to the control were significant only in treatments G and O. A general increase in the NO3-N and Olsen-P content of the soil was also observed, although differences relative to the control were not always significant. Therefore, co-composting of vinasse seems to be a very promising agricultural practice for solving the problem of the disposal of beet-vinasse.

## PCI

F. Madrid, R. López, J.M. Murillo y F. Cabrera

**Municipal solid waste compost utilization in greenhouse-cultivated sweet pepper.**

Libro: Proceedings of the 16th World Congress of Soil Science

Editor:

Volumen: CD-ROM ISBN:

Paginas: Ciudad: Montpellier, Francia

**Resumen.-** The effects of municipal solid waste compost (treatment MSW) (from Villarrasa-Huelva-Spain) and a commercial compost from olive mill wastewater (treatment OMW) on yield and mineral element contents of sweet pepper (Capsicum annuum L. cv. Itálica) and on selected chemical soil characteristics were studied. Untreated soil was used as control treatment. The experiment was carried out in a greenhouse in a sandy soil and using drip irrigation. The fertirrigation during the season was that usually employed by farmers in the region, for all treatments (4 kg N, 2 kg P2O5 and 4 kg K2O /1000 m2 per week). Each treatment was applied in single plots (ca. 300 m2). Yield was determined using 16 plants/plot. Four composite samples were collected at random in each plot for soil and plant analyses.

Soil incorporation of 2,1 kg m-2 (dry weight) of MSW compost (<10 mm, OM 26%, N 0,60%, P 0,27%, K 0,46%) improved plant nutrition and yield in comparison with the control (59, 45, 27, 20 and 29% of yield in control at the first harvestings). Soil incorporation of 0,5 kg m-2 (dry weight) of OMW compost (OM 29%, N 1,10%, P 0,31%, K 3,1%) did not increase yield. Plants from MSW treatment showed slightly higher but not statistically different Zn and Cu contents in leaf and fruit than plants in the control.

## PCI

Cox, L., Hermosin, M.C. y Cornejo J.

**Use of an organic amendment to retard simazine movement in soil**

Libro: 2nd Iberian Congress on Environmental Contamination and Toxicology: CICTA98IKTIK, Cuadernos de Investigación Biológica

Editor: Serv. Ed. UPV/EHU

Volumen: 20 ISBN: 0211-5700

Paginas: 515 - 518 Ciudad: Bilbao, España

**Resumen.-** Sorption, degradation and leaching of simazine in a sandy soil and in this soil amended with two different doses (10 % and 20 % w/w) of an organic amendment (26 % organic C) have been investigated. Sorption studies have been performed following a batch equilibration procedure and sorption isotherms fitted to Freundlich equation. Kf increased by a factor of 2.5 and 1.8 with high and low amendment dose, respectively. Mobility was studied in handpacked soil columns under fluctuating saturated/unsaturated flow conditions. Breakthrough curves were consistent with an inverse relationship between leaching and sorption, with greater mobility of simazine in the untreated sandy soil than in the amended soils. Recoveries of initially applied simazine in leachates after the application of 750 mL of water were 93 % for the original soil, 88 % for soil amended with the low dose of humic amendment and 53 % for the high dose, which is also consistent with degradation studies. These results indicate that the humic amendment reduces herbicide leaching by promoting sorption and degradation processes

## PCI

Carrizosa, M.J., Calderón, M.J., Hermosín M.C. y Cornejo

**Organoclays for cleanup of agrochemical contaminated soil**

Libro: 2nd Iberian Congress on Environmental Contamination and Toxicology, Cuadernos de Investigación Biológica

Editor: Serv. Edit. UPN/EHU

Volumen: 20 ISBN: 0211-5700

Paginas: 519 - 522 Ciudad: Bilbao, España

**Resumen.-** The sorption isotherms of bentazone on diverse organoclays (OCls) were measured at aqueous concentration from 25 to 1500 μM. Organoclays with large quaternary alkylammonium (hexadecyltrimethyl and dioctadecyldimethylammonium) or organophilic organoclays (AHDT and ADOD) were compared with those with primary large alkylammonium and small quaternary alkilammonium (octadecyl and phenyltrimethylammonium) or sorptive organoclays (AC18 and APT). The organophilic OCls show much higher adsorption ($AHDT_2$ Kd=1789; $ADOD_2$ Kd=1728) than the sorptive ones ($AC18_1$ Kd=40; $AC18_2$ Kd=38), suggesting hydrophobic bentazone-organocation interactions (partition) as the main responsible for sorption. The incubation of the two best adsorbent OCls with soil contaminated of bentazone shows that the availability of the herbicide decreased almost instantaneously. The herbicide is adsorbed on OCl and thus is inmobilized. The bentazone adsorbed on OCl is partially extractable with $CaCl_2$/methanol solution suggesting its bioavailability. Two OCls, one with high adsorption and other of low adsorption were assayed as carriers of bentazone by preparing bentazone-OCl complexes and monitoring this herbicide release in water and soil/water suspensions. Those bentazone-OCl complexes released 20 to 80% of their bentazone content, depending of the adsorbent capacity and the bentazone-OCl interaction. Results in this work show the ability of OCl to inmobilize pesticide in a contaminated soil and to protect soil and water by using OCl as pesticide carriers in slow release formulation.

*Key words*: pesticide, adsorption, removal, remediation, organoclay, soil and water protection, slow release.

## PCI

Cox, L., Hermosin, M.C., Celis, R., Walker, A., Calderón, M.J. y Cornejo, J.

**Conventional and reduced tillage as affecting herbicide leaching: experimental and simulation data**

Libro: Proc. 16 World Congress on Soil Science

Editor:

Volumen: CD-ROM ISBN:

Paginas: 1 - 6 Ciudad: Montpellier, Francia

**Resumen.-** A laboratory experiment has been carried out to assess the influence of conventional tillage (CT) and reduced tillage (RT) on leaching of clopyralid and metamitron. Undisturbed soil columns from the Ap horizon of a clay loam soil after three years of CT or RT practices have been used. Columns were saturated and eluted with 600 mL of water applied weekly for three weeks. Leachates were collected and columns sampled for soil extraction . Other columns were eluted daily with 150 mL of water in order to obtain BTCs. Leachates and soil extracts were analized by HPLC. Breakthrough of clopyralid occurred earlier in RT columns due to macropore flow, although the total amounts leached in RT (78 %) were lower than in CT (94 %). The total recovery of metamitron in leachates was lower in RT (5 %) than in CT (10 %). The residual herbicide in the soil after the application of 1800 mL of water were 66 % in RT and 88 % in CT systems for clopyralid, and 16 % in RT and 53 % in CT for metamitron. Since no differences were found between sorption on soils taken from RT and CT plots, the lower leaching observed for both herbicides under RT may be attributed to enhanced degradation in this system. The results suggest than RT could favour dissipation of herbicides from the soil, decreasing their potential leaching.

Key words: Leaching, clopyralid, metamitron, soil columns, conventional and reduced tillage

## PCI

Cox, L., Koskinen, W.C. y Yen P.I.

**Imidacloprid sorption-desorption in soils**

Libro: Proc. 16 World Congress of Soil Science

Editor:

Volumen: CD-ROM ISBN:

Paginas: 1 - 7 Ciudad: Montpellier, Francia

**Resumen.-** Sorption-desorption studies with imidacloprid [1-[(6-chloro-3-pyridinyl)methyl]-*N*-nitro-2-imidazolidinimine] were conducted with seven U.S. soils varying in their physicochemical properties (OC= 0.3-4 %, Clay= 3-43 %, pH= 5.7-7.8, CEC= 3.62-41) using the batch equilibration method. Initial imidacloprid concentrations ranged from 3 to 300 mg $L^{-1}$. Sorption coefficients $K_f$ and the soil properties organic carbon and CEC gave the higher single correlation coefficients; the last due to the positive correlation between OC and CEC. Sorption was irreversible, and hysteresis coefficients in general, higher at low soil solution concentrations. Sorption coefficients $K_f$ were significantly lower at 1:5 soil/solution ratio than at 1:1. This suggests a possible effect of a soluble soil component, such as salt concentration, on sorption; no significant differences in pH between solutions were detected.

Key words: imidacloprid, sorption, desorption, hysteresis

## PCI

Calderón M.J., Hermosín Mª Carmen, Aguer J.P., Belderrain J., Cornejo J.

**Organoclays to reduce herbicide soil leaching**

Libro: Proc. 16 World Congress of Soil Science

Editor:

Volumen: CD-ROM ISBN:

Paginas: 1 - 7 Ciudad: Montpellier, Francia

**Resumen.-** The herbicide contamination of waters are due to the processes of surface runoff and leaching through the soil profile which could be decreased by using pesticides in slow release formulations. Organoclays have been shown to be efficient as sorbent for non-polar organic contaminants and pesticides. The objective of this work was to asses the sorption capacity of some organoclays (low and high charge smectites saturated in primary and quaternary alkylammonium cations) for the herbicides fenuron and clopyralid and the ability of these sorbents to reduce the herbicide concentration in soil solution and hence its leaching through soil columns. The organoclay sorption of fenuron and clopyralid was measured by the batch equilibration technique and the best adsorbent was selected to prepare the herbicide-OCl complexes (strongly and weakly sorbed at 2 and 4% herbicide contents) to be assayed. The release of herbicide from these complexeswas monitored in water and water/soil suspension. The soil leaching profile of technical and OCl-formulated herbicides was monitored using handpacked (sandy-clay) soil columns, previously water saturated, and watered daily with 50 ml of water. The maximum sorption were found for high charge organosmectites. Fenuron shows highest sorption in quaternary alkylammonium sample whereas clopyralid did in primary alkylammonium sample. The concentration of both herbicides released from the herbicide-OCl complexes mixed with soil were found to be lower than those of the free technical compounds. The herbicide soil leaching profiles showed a high decrease in the peak maximum concentration for all OCl-formulated compounds. The total leachate of the highly mobile clopyralid was reduced (from 100 to 50 and 40%) in all the formulations assayed but the medium mobile fenuron did only in the strong sorbed formulations (from 55 to 40 and 20%). The weak sorbed formulations of fenuron leached out the same even high amount of herbicide (from 55 to 65%). This unexpected result could be indicates a decrease of the fenuron soil degradation in OCl-formulation and it would allow to decrease the doses of this herbicide. These preliminary results show OCls as promising supports for the herbicide fenuron and clopyralid to decrease their concentration in water, in water/soil suspension and in soil leachates.

Key words: organoclay, fenuron, clopyralid, slow release

## PCI

Urzi, C., Krumbein ,W.E., Saiz-Jimenez, C., Pernice, A., Ventimiglia, R

**Heavy microbial colonisation and biodeterioration of frescoes of "Villa Romana del Casale", Piazza Armerina (EN).**

Libro: Proceeding of the 1st Int. Congr. on 'Science and Technology for the Safeguard of Cultural Heritage in the Mediterranean Basin'

Editor: Guarino A. and De Leo A

Volumen: II ISBN:

Paginas: 1235 - 1238 Ciudad: Palermo, Italia

Incluido en SCI: No

## PCI

P. Rodríguez-Rubio, C. Maqueda, J.L. Pérez-Rodríguez and A. Valero
**Iron oxides in clay fractions from soils in Southwest of Spain (Huelva)**
Libro: II Mediterranean Clay Meeting
Editor:
Volumen: 2 ISBN:
Paginas: 140 - 144 Ciudad:
Incluido en SCI: No

## PCI

F. Moreno, F. Pelegrín, J.E. Fernández, J.M. Murillo
**Influence of traditional and conservation tillage on soil physical properties in southern Spain**
Libro: Proceedings of the 16th World Congress of Soil Science
Editor:
Volumen: CD-ROM ISBN:
Paginas: 1 - 7 Ciudad: Montpellier, Francia

## PCI

L. Andreu, F. Moreno, F. Cabrera, R. Vaz
**Surge-flow irrigation in a reclaimed salt-affected soil in SW Spain**
Libro: Proceedings of the 16th World Congress of Soil Science
Editor:
Volumen: CD-ROM ISBN:
Paginas: 1 - 8 Ciudad: Monpellier, Francia

## PCI

Cox, L., Celis, R., Hermosin M.C. and Cornejo J.
**Smectite-herbicide association to reduce herbicide leaching**
Libro: 2nd Mediterranean Clay Meeting MCM´98, Extended Abstracts
Editor: C.S.F. Gomez,, APA-Universidade de Aveiro
Volumen: 2 ISBN: 972/8021-69-0
Paginas: 279 - 284 Ciudad: Aveiro, Portugal

## PCI

Carrizosa, M.J., Calderón, M.J., Hermosín, M.C. y Cornejo J.
**Soil remediation and protection by organoclays**
Libro: 2nd Mediterranean Clay Meeting, MCM´98, Extended Abstracts
Editor: CSF Gomes, APA-Universidade de Aveiro
Volumen: 2 ISBN: 972/8021-69-0
Paginas: 285 - 290 Ciudad: Aveiro, Portugal

## PCI

Calderón, M.J., Hermosin, M.C., Aguer J.P. and Cornejo, J.
**Organoclays for controlled release of an ureic herbicide**
Libro: 2nd Mediterranean clay Meeting, MCM´98, Extended Abstracts
Editor: CSF Gomes, APA-Universidade de Aveiro
Volumen: 2 ISBN: 972/8021-69-0
Paginas: 291 - 297 Ciudad: Aveiro, Portugal

## PCI

Barriga, C., Gaitan, M., Hermosin, M.C., Pavlovic I. y Ulibarri M.A.
**Hydrotalcite organic anion adsorption:Effect of interlayer anion and layer composition**
Libro: 2nd Mediterranean Clay Meetting, MCM´98
Editor: CSF Gomes, APA-Universidade de Aveiro
Volumen: 2 ISBN: 972/8021-69-0
Paginas: 311 - 316 Ciudad: Aveiro, Portugal

## PCI

U. Tomati, E. Madejon, E. Galli, J. Cegarra y A. Roig
**Los abonos preparados a partir de subproductos del olivo en la agricultura ecologica**
Libro: Actas ECOLIVA, II Jornadas Mediterraneas de olivar ecológico y Ecologia del aceite de Oliva.
Editor:
Volumen: ISBN:
Paginas: Ciudad: Puente Genave. Jaén, España

## Trabajos completos en actas de congresos nacionales (PCN)

### PCN

R. López, I. García, F. Cabrera, J.Murillo
**Nitrato en peciolos de fresa**
Libro: Actas XV Jornadas Agrícolas y Comerciales
Editor:
Volumen:
Paginas: 25 - 28
Fecha de publicación: 15/12/1998
ISBN:
Ciudad: Huelva, España

# 3.2. Formación

## Tesis doctorales (TDR)

### TDR

Manuel López García

**Estudio de la variabilidad genotípica de cultivares de algodón en respuesta a condiciones de sequía.**

Facultad: Biología

Universidad: Córdoba

Director: J.C.Gutiérrez Más, E.O. Leidi

Calificación: Apto cum laude

Fecha: 31/01/1998

**Resumen.-** En esta tesis se estudia la variabilidad genotípica para una serie de caracteres morfofisiológicos relacionados con el rendimiento en secano de algodón, se estiman para algunos de estos caracteres, parámetros genéticos de interés en la mejora de la especie, y se define el ideotipo de planta de algodón para condiciones de secano en climas de tipo mediterráneo y suelos con alta capacidad de retención de agua. Esta información se obtuvo a partir dc experimentos realizados con distintos genotipos de algodón tipo Upland durante los año 1990, 1991, 1992 y 1993.

Los trabajos de esta tesis se inician con el estudio de 65 genotipos representativos de los algodones cultivados en distintas regiones del mundo, dirigido a cuantificar la variabilidad en el rendimiento y algunos de sus componentes, en condiciones de secano. Posteriormente, con un menor número de genotipos (elegidos del grupo anterior) se analiza la variabilidad en el rendimiento y algunos de sus componentes, así como la de caracteres morfofisiológicos relacionados con la adaptación al estres hídrico, y se estudia la heredabilidad de los caracteres.

En función de los resultados obtenidos, el ideotipo de algodón para el cultivo en condiciones de secano en climas de tipo mediterráneo y en suelos con alta capacidad de retención de agua sería el de una planta con: 1.- capacidad para mantener un estado hídrico suficiente para sostener la actividad transpiratoria y fotosintética durante el período de llenado de cápsula; 2.- un alto número de sitios reproductivos; 3.- una retención de frutos ajustada a la capacidad fotosintética que permita maximizar el número de cápsulas abiertas al final del ciclo; y 4.- una calidad de fibra aceptable.

Consideramos que esto puede conseguirse con cultivares que desarrollen un sistema radical profundo y extendido, capaz de suministrar el agua necesaria para mantener la apertura estomática, la transpiración y la fotosíntesis. No obstante, no debe desestimarse el papel de otros mecanismos, como capacidad de ajuste osmótico, eficiencia en el uso del agua para la fijación de carbono y alta capacidad de translocación de las reservas de fotoasimilados en las estructuras de sostén a los órganos reproductivos.

### TDR

José Ignacio Pérez Martínez

**Obtención y caracterización de complejos de inclusión del ácido 2,4-diclorofenoxiacético con ciclodextrinas: aplicación a la descontaminación de suelos.**

Facultad: Farmacia

Universidad: Sevilla

Director: E. Morillo, J.M. Ginés y M.J. Arias

Calificación: Sobresaliente cum laude

Fecha: 19/06/1998

**Resumen.-** Se estudia el efecto que determinadas ciclodextrinas (CDs) ejercen sobre el plaguicida utilizado. Dicho plaguicida es el ácido 2,4-diclorofenoxiacético (2,4-D). Las CDs empleadas son la alfa, beta, y algunas beta sustituidas. La elaboración de compuestos de inclusión con CDs se llevó a cabo tanto en medio sólido como en líquido. De igual manera para el estudio de los complejos de inclusión hemos empleado técnicas en medio líquido y en medio sólido. De igual manera se realizaron estudios de velocidad de disolución con el fin de observar el efecto que las CDs ejercen sobre los parámetros eficacia de disolución y porcentaje disuelto.

Una vez confirmada la presencia de complejos para la mayoría de los sistemas binarios plaguicida-CD, se procedió al estudio sobre suelo. Dichos estudios de interacción del plaguicida con el suelo fueron realizados tanto en sistemas cerrados (batch) como en sistemas abiertos (columnas). En ambos sistemas se confirmó que cuando se aplica en primer lugar la CD, se ve favorecida la adsorción del plaguicida por el suelo, disminuyendo la velocidad de flujo a través del mismo. Por otra parte la CD actúa como descontaminante de el suelo ya que es capaz de desorber el 100 % del plaguicida que previamente ha sido adsorbido sobre el mismo.

## TDR

Ivana Pavlovic
**Adsorción de contaminantes orgánicos en hidrotalcitas**
Facultad: Ciencias
Universidad: Córdoba
Director: M. Carmen Hermosin y M. Angeles Ulibarri
Calificación: Sobresaliente cum laude
Fecha: 18/12/1998

# Trabajos fin de carrera (TFC)

## TFC

María Jiménez Padilla
**Influencia de concentraciones crecientes de NaCl sobre el desarrollo "in vitro" de embriones cigóticos de olivo"**
Facultad: E.U.I.T.A. (Cortijo El Cuarto) Sevilla.
Universidad: Sevilla
Director: A. Troncoso, J.Liñán y M. Cantos.
Calificación: Sobresaliente (Matr. de Honor)
Fecha: 22/09/1998

## TFC

Manuel Maria Carrillo García
**Influencia de los plaguicidas aminotriazol y 2,4-D en la adsorción-desorción y movilidad de Cu en suelos de la zona fresera de Huelva: Efecto de la adición de residuos orgánicos**
Facultad: Escuela Universitaria de Ingenieria Técnica Agrícola. Cortijo de Cuarto.
Universidad: Sevilla
Director: C. Maqueda y E. Morillo
Calificación: Notable
Fecha: 15/9/98

## TFC

Victor Martín García
**Estudio de la adsorción y movilidad de glifosato en suelos: Efecto de la adición de Cu y residuos sólidos urbanos**
Facultad: Escuela Universitaria de Ingenieria Técnica Agrícola
Universidad: Sevilla
Director: E. Morillo y C. Maqueda
Calificación: Notable
Fecha: 15/9/98

## TFC

Maria del Carmen Fernández Díaz.
**Utilización como fertilizante de compost urbano procedente de la planta de compostaje de Villarrasa (Huelva).**
Facultad: Escuela Universitaria de Ingeniería Técnica Agrícola. Cortijo de Cuarto.
Universidad: Sevilla
Director: J.M. Murillo, R. López y F. Cabrera
Calificación: Sobresaliente
Fecha: 15/09/1998

## TFC

Inmaculada García de la Malla
**Control analítico de la influencia del nitrógeno en la producción del fresón**
Facultad: Escuela Universitaria de Ingeniería Técnica Agrícola. Cortijo de Cuarto.
Universidad: Sevilla

Director: R. López
Calificación: Notable
Fecha: 15/12/98

# Trabajos fin de curso (TFS)

## TFS

Miguel Angel Marín Cantarero
**Estudio de la adsorción-desorción de cobre en presencia y ausencia del plaguicida aminotriazol: efecto de la adición de residuos orgánicos.**
Facultad: XXXV Curso Internacional de Edafología.
Universidad: Sevilla
Director: C. Maqueda E. Morillo y A. Justo
Calificación:
Fecha: 24/07/1998

# 3.3. Patentes y marcas

**Autores:** P. Prieto-Dapena, C. Almoguera y J. Jordano
**Marca:** Promotor y secuencias reguladoras de Ha ds10 G1...
**Número:** 9800122
**Fecha:** 23/01/1998
**Descripción.-** Con la presente invención aislamos y caracterizamos en plantas transgénicas de tabco, el promotor y las secuencias reguladoras de un gen LEA-I de girasol, Ha ds10 G1. Estas secuencias presentan unas características muy apropiadas para su uso en la modificación de semillas (por ej. de sustancias de reservas). Las ventajas de su posible uso en plantas transgénicas se muestran mediante ejemplos como estudios de la acumulación y localización del ARNm Ha ds10 en el sistema homólogo. Estos estudios muestran tanto los elevados niveles de expresión alcanzados durante la embriogénesis desde fases tempranas de la maduración, como su absoluta especificidad de semilla, acompañada de una localización homogénea en embriones que acaba restringiéndose fundamentalmente en el parénquima en empalizada de los cotiledones, un tejido especializado en la acumulación de sustancias de reservas en el girasol.

# 4. PARTICIPACION EN CONGRESOS

# 4.1. Congresos Internacionales

Autor/es: J.C. Montaño y P. Salmerón
Asistente/es: J.C. Montaño
**"Instantaneous and Full Compensation in Three-Phase Systems"**
Congreso: IEEE Power Engineering Society 1998 Winter Meeting
Fecha: 01/02/1998 Ciudad: Tampa, Florida, EE.UU.
**Código de publicación:** Oral

Autor/es: C. Saiz-Jimenez, B. Hermosin
Asistente/es: C. Saiz-Jimenez, B. Hermosin
**Thermally assisted hydrolysis and methylation of the black deposit coating the ceiling and walls of Cueva del Encajero, Quesada, Spain**
Congreso: Pyrolysis 98
Fecha: 18/05/1998 Ciudad: Munich, Alemania
**Código de publicación:** Poster

Autor/es: C. Saiz-Jimenez, B. Hermosin
Asistente/es: C. Saiz-Jimenez, B. Hermosin
**Thermally assisted hydrolysis and methylation of dissolved organic matter in dripping waters from Altamira Cave**
Congreso: Pyrolysis 98
Fecha: 18/05/1998 Ciudad: Munich, Alemania
**Código de publicación:** Poster

Autor/es: B. Hermosin, C. Saiz-Jimenez
Asistente/es: C. Saiz-Jimenez, B. Hermosin
**Thermally assisted hydrolysis and methylation of milled beech leaf litter**
Congreso: Pyrolysis 98
Fecha: 18/05/1998 Ciudad: Munich, Alemania
**Código de publicación:** Poster

Autor/es: Díaz-Espejo A, Palomo MJ, fernández JE y Girón IF
Asistente/es: Díaz-Espejo A.
**Transpiration in mature olive trees: sap flow measurements versus porometer data**
Congreso: 4th International Workshop on Field Techniques for Environmental Physiology
Fecha: 30/03/1998 Ciudad: Almería, España
**Código de publicación:** Oral

Autor/es: Dáiz-Espejo A, Palomo MJ, Fernández JE, Girón IF y Moreno F
Asistente/es: Fernández JE y Díaz-Espejo A
**Water relations and sap flow in mature olive trees**
Congreso: 5th ESA Congress
Fecha: 28/06/1998 Ciudad: Nitra, Eslovaquia
**Código de publicación:** Poster

Autor/es: Palomo MJ, Díaz-Espejo A, Fernández JE, Girón IF y Moreno F
Asistente/es: Fernández JE y Palomo MJ
**Using sap flow measurements to quantify water consumption in the olive tree**
Congreso: 1st Inter-Regional Conference on Environment-Water: Innovative Issues in Irrigation and Drainage
Fecha: 16/09/1998 Ciudad: Lisboa, Portugual
**Código de publicación:** Oral

Autor/es: Fernández JE, Palomo MJ, Díaz-Espejo A, Girón
Asistente/es: Fernández JE
**Measuring sap flow in olive trees: potentialities and limitations of the compensation heat-pulse technique**
Congreso: 4th Workshop on Measuring Sap Flow in Intact Plants
Fecha: 03/10/1998 Ciudad: Zidlochovice, Republica Checa
**Código de publicación:** Oral

Autor/es: Palomo MJ, Díaz-Espejo, Fernández JE, Girón IF y Moreno F
Asistente/es:
**Sap flows in different conductive organs of the olive tree and the influence of environmental variables**
Congreso: 4º Simposium Hispano-Portugués de Relaciones Hídricas en las plantas
Fecha: 02/11/1998 Ciudad: Murcia, España
**Código de publicación:** Oral

Autor/es: F. Moreno, E. Fernández-Boy, F. Cabrera, J.E. Fernández, M.J. Palomo, I.F. Girón, B. Bellido
Asistente/es: Dr. F. Moreno
**Irrigation with saline water in the reclaimed marsh soils of south-west Spain: Impact on soil properties and cotton crop**
Congreso: International Workshop on the Use of Saline and Brackish Water for Irrigation
Fecha: 23/07/1998 Ciudad: Bali, Indonesia
**Código de publicación:** Oral

Autor/es: F. Moreno, J.E. Fernández, M.J. Palomo, I.F. Girón, J.M. Villau, A. Diaz-Espejo
Asistente/es: Dr. F. Moreno
**Measurements of soil hydraulic properties in an olive orchard under drip irrigation**
Congreso: 1st Inter-Regional Conference "Environment-Water: Innovative Issues in Irrigation and Drainage"
Fecha: 15/09/1998 Ciudad: Lisboa, Portugual
**Código de publicación:** Oral

Autor/es: del Río J.C., Gutierrez A., Gonzalez-Vila F.J., Martin F. and Romero J.
Asistente/es: J.C. del Río & F.J. Gonzalez-Vila
**Application of pyrolysis-gas chromatography-mass spectrometry to the analysis of pitch deposits and synthetic polymers in pulp and pulp mills.**
Congreso: 14th International Symposium on Pyrolysis
Fecha: 18/05/1998 Ciudad: Munich, Alemania
**Código de publicación:** Poster

Autor/es: Gonzalez-Vila F.J., Almendros G., del Río J.C., Martin F., Gutierrez A. and Romero J.
Asistente/es: J.C. del Río & F.J. Gonzalez-Vila
**Ease of delignification assesment of different Eucalyptus wood species by Py(Me)/GC/MS**
Congreso: 14th International Symposium on Pyrolysis
Fecha: 18/05/1998 Ciudad: Munich, Alemania
**Código de publicación:** Poster

Autor/es: González-Vila F.J., Bautista J.M., Martín F., del Río J.C. and Gutierrez A.
Asistente/es: F.J. González-Vila
**Optimization of the supercritical fluid extraction of lipids from a contaminated soil.**
Congreso: 22nd International Symposium on Chromatography
Fecha: 13/09/1998 Ciudad: Roma, Italia
**Código de publicación:** Poster

Autor/es: Gutiérrez A., del Río J.C., Martínez M.J. and Martínez A.T.
Asistente/es: Gutiérrez A.
**Analyses of acetone extracts from eucalypt wood, pitch deposits and biologically-pretreated wood.**
Congreso: 7th International Conference in Biotechnology in the Pulp and Paper Industry
Fecha: 16/06/1998 Ciudad: Vancuver, Canadá
**Código de publicación:** Oral

Autor/es: Martínez M.J., Barrasa J.M., Gutiérrez A., del Río J.C., and Martínez A.T.
Asistente/es: Gutiérrez A.
**Biological depitching of eucalypt wood with Ascomycetous and Basidiomycetous fungi**
Congreso: 7th International Conference in Biotechnology in the Pulp and Paper Industry
Fecha: 16/06/1998 Ciudad: Vancuver, Canadá
**Código de publicación:** Poster

Autor/es: J. Gorham, E.O. Leidi, J. Bridges, J.C. Gutiérrez
Asistente/es: E.O. Leidi Montes
**Physiology of cotton under irrigated and dryland cultivation in Spain.**
Congreso: World Cotton Research Conference-2
Fecha: 06/09/1998 Ciudad: Atenas, Grecia
**Código de publicación:** Oral

Autor/es: E.O. Leidi, M. López, J.C. Gutiérrez
Asistente/es: E.O. Leidi Montes
**Leaf carbon isotope discrimination in Gossypium hirsutum under drought conditions.**
Congreso: World Cotton Research Conference - 2
Fecha: 06/09/1998 Ciudad: Atenas, Grecia
**Código de publicación:** Poster

Autor/es: E.O. Leidi, J.C. Gutiérrez, J. McD. Stewart
Asistente/es: E.O. Leidi Montes
**Variability in K and Na uptake in wild and commercial Gossypium hirsutum seedlings under saline conditions.**
Congreso: World Cotton Research Conference 2
Fecha: 06/09/1998 Ciudad: Atenas, Grecia
**Código de publicación:** Oral

Autor/es: J.C. Gutiérrez, M. López, E.O. Leidi
Asistente/es: E.O. Leidi Montes
**Crop Water Stress Index (CWSI) as an indicator of water stress and yield performance among cotton cultivars.**
Congreso: World Cotton Research Conference - 2
Fecha: 06/09/1998 Ciudad: Atenas, Grecia
**Código de publicación:** Oral

Autor/es: J.C. Gutiérrez, M. López, E.O. Leidi
Asistente/es: E.O. Leidi Montes
**Drought susceptibility index: and indicator of genotypic drought tolerance in upland cotton.**
Congreso: World Cotton Research Conference - 2
Fecha: 06/09/1998 Ciudad: Atenas, Grecia
***Código de publicación:*** Oral

Autor/es: E.O. Leidi
Asistente/es: E.O. Leidi Montes
**Efecto de la Interacción N x P en la respuesta a la inoculación en Phaseolus vulgaris.**
Congreso: 2a Reunión Proyecto Phosphorus/Phaseolus/Rhizobium
Fecha: 17/12/1998 Ciudad: Quivicán, Cuba
**Código de publicación:** Oral

Autor/es: Murillo, J.M.; Cabrera, F.; López, R.; Vázquez, B.
Asistente/es: J.M. Murillo; F. Cabrera; Vázquez, B.
**Humic amendment derived from 'alpechin' compost. A worthwhile liquid organic fertilizer**
Congreso: 16th World Congress of Soil Science
Fecha: 20/08/1998 Ciudad: Montpellier, Francia
**Código de publicación:** Poster

Autor/es: P.A. Siljeström, A. Moreno & J.J. Rey
Asistente/es: Patricia Siljeström Ribed
**Monitoring Sea Meadows For The Sustainability Of Fisheries Resources**
Congreso: 27th International Symposium on Remote Sensing of Environment
Fecha: 08/06/1998 Ciudad: Tromso, Noruega
**Código de publicación:** Poster

Autor/es: Moreno, A., Siljeström P. & Rey J.
Asistente/es: Adela Moreno López
**Benthic Phanerogam Species Recognition In Side Scan Sonar Images: Importance Of The Sensor Direction**
Congreso: Fourth European Conference on Underwater Acoustics
Fecha: 21/09/1998 Ciudad: Roma, Italia
**Código de publicación:** Oral

Autor/es: García Fernández, J.L., Troncoso de Arce, A., Sarmiento Solís, Rafael
Asistente/es: Rafael Sarmiento, José Luis García, Antonio Troncoso
**Fuentes de carbono en el cultivo "in vitro" del olivo.**
Congreso: VII Simposio Nacional - III Ibérico sobre Nutrición Mineral de las Plantas.
Fecha: 23/09/1998 Ciudad: Madrid, España
**Código de publicación:** Poster

Autor/es: R. Carranco, C. Almoguera, I. Sánchez-Aguado y J. Jordano
Asistente/es: J.Jordano
**Changes in subcellular localization of small heat shock proteins during seed germination: Involvement in desiccation tolerance and storage-protein mobilization?**
Congreso: Seed science in the field of genetically controlled stress physiology. COST 828 ACTION EEC Meeting
Fecha: 13/11/1998 Ciudad: Toulouse, Francia
**Código de publicación:** Oral

Autor/es: J. Jordano, A. Rojas, R. Carranco, P. Prieto-Dapena y C. Almoguera.
Asistente/es: J. Jordano
**Differential activation of small heat-shock gene promoters during plant embryogenesis:involvement of heat shock elements and chromatin structure?**
Congreso: Workshop on "Chromatin and modification: Plant gene expression and silencing". Instituto Juan March. Centre for International Meetings in Biology
Fecha: 07/10/1998 Ciudad: Madrid, España
**Código de publicación:** Oral

Autor/es: Cox, L, Hermosín, M.C. y Cornejo J.
Asistente/es: M.C.Hermosín, Juan Cornejo
**Use of an organic amendment to retard simazine movement in soil**
Congreso: 2nd Iberian Congress on Environmental Contamination and Toxicology: CICTA98IKTIK
Fecha: 12/06/1998 Ciudad: Bilbao, España
**Código de publicación:** Poster

Autor/es: E. Morillo, R. Fernández-Urrusuno, J.I. Pérez-Martínez and J.M. Ginés
Asistente/es: E. Morillo
**Study of complexation between the pesticide chlorpyrifos and B- and HP-B-cyclodextrins.**
Congreso: 9th International Symposium on Cyclodextrins
Fecha: 01/06/1998 Ciudad: Santiago de Compostela, España
**Código de publicación:** Poster

Autor/es: J.I. Pérez-Martínez, M.J. Arias, j.r. Moyano, E. Morillo, A. Rabasco and J.M. Ginés
Asistente/es: E. Morillo
**2,4-Dichlorophenoxyacetic acid-a- and B-CD inclusion complexes. A H-nuclear magnetic resonance study.**
Congreso: 9th Symposium on Cyclodextrins
Fecha: 01/06/1998 Ciudad: Santiago de Compostela, España
**Código de publicación:** Poster

Autor/es: T. Undabeytia, S. Nir, G. Ritwo, E. Morillo and C. Maqueda
Asistente/es: T. Undabeytia
**Modelling adsorption-desorption processes of Cd on montmorillonite**
Congreso: The Israel Society of Clay Research
Fecha: Ciudad: Rehovot, Israel
**Código de publicación:** Oral

Autor/es: E. Díaz-Barrientos y L. Madrid
Asistente/es: L. Madrid
**Application of the EU-BCR sequential extraction method to study the influence of the addition of several organic wastes to a soil on its metal contents.**
Congreso: 1st International Conference on Trace Element Speciation in Biomedical, Nutritional and Environmental Sciences.
Fecha: 04/05/1998 Ciudad: Munich, Alemania
**Código de publicación:** Oral

Autor/es: F. Cabrera, E. Madejón, R. López, J.M. Murillo
Asistente/es: F. Cabrera, J.M. Murillo
**Agricultural use of three (sugarbeet) vinasse composts: effect on selected soil chemical properties**
Congreso: 16th World Congress of Soil Science
Fecha: 20/08/1998 Ciudad: Montpellier, Francia
**Código de publicación:** Oral

Autor/es: F. Madrid, R. López, J.M. Murillo y F. Cabrera
Asistente/es: F. Madrid, F. Cabrera, J.M. Murillo
**Municipal solid waste compost utilization in greenhouse-cultivated sweet pepper.**
Congreso: 16th World Congress of Soil Science
Fecha: 20/08/1998 Ciudad: Motpellier, Francia
**Código de publicación:** Poster

Autor/es: M.J. Carrizosa, M.J. Calderón, M.C. Hermosiín y J. Cornejo
Asistente/es: M. C. Hermosin, J. Cornejo
***Soil remediation and protection by organic clays***
Congreso: 2nd Mediterranean Clay Meetting
Fecha: 19/09/1998 Ciudad: Aveiro, Portugual
**Código de publicación:** Poster

Autor/es: C. Barriga, M. Gaitán, M.C. Hermosín, I. Pavlovic y M.A. Ulibarri
Asistente/es: M.C.Hermosin, J.Cornejo y M.A. Ulibarri
**Hydrotalcite organic anion adsorption: Effect of interlayer anion and layer composition**
Congreso: 2nd Mediterranean Clay Meeting
Fecha: 16/09/1998 Ciudad: Aveiro, España
**Código de publicación:** Oral

Autor/es: M.J. Calderón, M.C.Hermosín, J.P. Aguer y J. Cornejo
Asistente/es: M.C. Hermosin y J. Cornejo
**Organoclays for controlled release of an ureic herbicide**
Congreso: 2nd Mediterranean Clay Meeting
Fecha: 16/09/1998 Ciudad: Aveiro, Portugual
**Código de publicación:** Oral

Autor/es: Cox, L., Hermosin, M.C., Celis, R., Walker A., Calderon, M.J. y Cornejo, J.
Asistente/es: L. Cox y M.J. Calderon
**Conventional and reduced tillage as affecting herbicide leaching: experimental and simulation data**
Congreso: 16 World Congress of Soil Science
Fecha: 20/08/1998 Ciudad: Montpellier, Francia
**Código de publicación:** Poster

Autor/es: Koskinen, W.C., Cox L. y Pay Y.Y.
Asistente/es: L. Cox
**Imidacloprid sorption-desorption in soil**
Congreso: 16 World Congress of Soil Science
Fecha: 20/08/1998 Ciudad: Montpellier, Francia
**Código de publicación:** Poster

Autor/es: M.J. Carrizosa, M.J. Calderón, M.C.Hermosin, W.C.Koskinen and J. Cornejo
Asistente/es: M. J. Carrizosa
**Adsorption of Bentazon on Organoclays**
Congreso: Annual Meeting of ASA, CSSA & SSSA
Fecha: 18/10/1998 Ciudad: Baltimore, EE.UU.
**Código de publicación:** Poster

Autor/es: Celis, R., Koskinen, W.C., Baker, J.M. y Breiter W.
Asistente/es: R. Celis
**Sorption and volatilization of the fungicide triadimefon in soils**
Congreso: Annual Meeting of AS, CSSA & SSSA
Fecha: 18/10/1998 Ciudad: Baltimore, EE.UU.
**Código de publicación:** Poster

Autor/es: R. Celis, E. Barriuso, S.Houot, J. Cornejo y W.C. Koskinen
Asistente/es: R.Celis
**Sorption and desorption of atrazine in sludge amended soil**
Congreso: Annual Meeting of ASA, CSSA & SSSA
Fecha: 18/10/1998 Ciudad: Baltimore, EE.UU.
**Código de publicación:** Poster

Autor/es: Troncoso, A.; Pérez, A.; Cantos, M.; Liñán, J.
Asistente/es: Troncoso, A.; Liñán, J. Cantos, M.
**Germinación de semillas y embriones de olivo.**
Congreso: I Simposio Nacional de Olivicultura.
Fecha: 15/09/1998 Ciudad: Bragança, Portugal
**Código de publicación:** Oral

Autor/es: Matte, C.; Cantos, M.; Troncoso, A.
Asistente/es: Troncoso, A.; Liñán, J.; Cantos, M.
**Influencia del medio "vid" en la propagación "in vitro" de variedades de vid.**
Congreso: VII Simposio Nacional - III Ibérico de la Nutrición Mineral de las Plantas.
Fecha: 23/09/1998 Ciudad: Madrid, España
**Código de publicación:** Poster

Autor/es: Carretero, C.L.; Cantos, M.; de Castro, A.; Mazuelos, C.; Liñán, J.; Troncoso, A.
Asistente/es: Troncoso, A.; Cantos, M.; Liñán, J.
**Influencia de la salinidad sobre la composición mineral de plantas jóvenes del clon IRNAS-1 de mandioca (Manihot esculenta, Crantz).**
Congreso: VII Simposio Nacional - III Ibérico de la Nutrición Mineral de las Plantas.
Fecha: 23/09/1998 Ciudad: Madrid, España
**Código de publicación:** Oral

Autor/es: Ortega-Calvo, J.J., Lahlou, M. y García-Junco, M.
Asistente/es: J.J. Ortega
**Microbial mechanisms to increase the bioavailability of hydrophobic pollutants in soils**
Congreso: Annual Meeting of COST Action 831, Biotechnology of Soil: Monitoring, Conservation and Remediation,
Fecha: 10/12/1998 Ciudad: Roma, Italia
**Código de publicación:** Oral

Autor/es: Aguer, J.P.; Cox, L; Hermosín, M.C.; Cornejo, J.
Asistente/es: Hermosín, M.C.; Cornejo, J.
**Napropamide sorption – desorption in soils and sediments**
Congreso: Societa Italiana di Chimica Agraria
Fecha: 2/10/1998 Ciudad: Ravello, Italia
**Código de publicación:** Poster

## 4.2. Congresos Nacionales

Autor/es: del Río J.C., Gutiérrez A., Romero J., González-Vila F.J. y Martín F.
Asistente/es: J.C del Río & F.J. González-Vila
**Analysis of impurities occurring in a TCF-bleached kraft pulp of Eucalyptus globulus wood.**
Congreso: XXVII Reunión Científica del Grupo de Cromatografía y Técnicas Afines
Fecha: 08/07/1998 Ciudad: Lugo, España
**Código de publicación:** Poster

Autor/es: González-Vila F.J., Lankes U., Martín F., del Río J.C. and Verdejo T.
Asistente/es: J.C. del Río & F.J. González-Vila
**Detección de contaminantes orgánicos en fracciones húmicas acuáticas mediante termoquimiolisis en presencia de hidróxido de tetrametilamonio-GC-MS.**
Congreso: XXVII Reunión Científica del Grupo de Cromatografía y Técnicas Afines
Fecha: 08/07/1998 Ciudad: Lugo, España
**Código de publicación:** Poster

Autor/es: González-Vila F.J., Lankes U., Gutierrez A., del Río J.C. and Martín F.
Asistente/es: González-Vila F.J.
**RMN de 13C de extractos de madera de Eucalyptus globulus y de depósitos de pitch**
Congreso: XVI Reunión Nacional de Espectroscopía
Fecha: 01/09/1998 Ciudad: Sevilla, España
**Código de publicación:** Poster

Autor/es: Cabrera, F.; Clemente, L.; López, R.; Díaz, E.; Madrid, L.; Maqueda, C.; Murillo, J.M.; Marañón, T. y Cornejo, J.
Asistente/es: Cabrera, F.; Clemente, L.; López, R.; Marañón, T.; Murillo, J.M.
**Contaminación por metales pesados de suelos característicos de la Cuenca del Guadiamar afectados por el vertido tóxico**
Congreso: Jornadas científicas para analizar los resultados obtenidos durante el seguimiento del efecto del vertido tóxico en el entorno de Doñana
Fecha: 29/09/1998 Ciudad: El Rocío, Almonte(Huelva), España
**Código de publicación:** Oral

Autor/es: A. Rojas, R. Carranco, P. Prieto-Dapena, C. Almoguera y J. Jordano
Asistente/es: J. Jordano, C. Almoguera
**Regulación de genes sHSP durante la embriogénesis: similitudes y diferencias con la respuesta transcripcional al estrés térmico.**
Congreso: XXI Congreso de la Sociedad Española de Bioquímica y Biología Molecular.
Fecha: 22/09/1998 Ciudad: Sevilla, España
**Código de publicación:** Oral

Autor/es: J.C. Montaño y M. Castilla
Asistente/es: J.C. Montaño y M. Castilla
**INVESPOT, Actas, pp. 109-110**
Congreso: 8ª Reunión Nacional de Grupos de Investigación en Ingeniería Eléctrica
Fecha: 20/01/1998 Ciudad: Cádiz, España
**Código de publicación:** Oral

Autor/es: Marañón, T., Garrido, B., Hidalgo, R, Díaz, M.D. y Arroyo, J.
Asistente/es: Marañón, T.
**Niveles de biodiversidad en la cuenca del Hozgarganta (Cádiz-Málaga)**
Congreso: XXXVIII Reunión científica de la S.E.E.P.
Fecha: 02/06/1998 Ciudad: Soria, España
**Código de publicación:** Poster

Autor/es: Ceballos, G.L., Marañón, T. y Mazuelos, C.
Asistente/es: Ceballos, G.L.
**Regeneración de Genista tridens (Cav.) D.C. sobre suelos ácidos**
Congreso: VII Simposio de Nutrición Mineral de las Plantas
Fecha: 23/09/1998 Ciudad: Madrid, España
**Código de publicación:** Oral

Autor/es: R. López, I. García, F. Cabrera, J.Murillo
Asistente/es: F. Cabrera, R. López
**Nitrato en peciolos de fresa**
Congreso: XV Jornadas Agrícolas y Comercaiales
Fecha: Ciudad: Huelva, España
**Código de publicación:** Oral

Autor/es: Paneque, P.; Cantos, M.; Limón, J.A.; Paneque, G. Troncoso, A.
Asistente/es: Troncoso, A.; Liñán, J.; Cantos, M.
**MEJORA DE LA CALIDAD DEL MOSTO DEL ALJARAFE: Influencia del suelo, de la planta y de los microrganismos.**
Congreso: Jornada de Viticultuya y Enología (Dirección General de Agricultura y Pesca de la Junta de Andalucía).
Fecha: 14/01/1998 Ciudad: Cabra (Córdoba), España
**Código de publicación:** Poster

Autor/es: Carretero, C.L.; Cantos, M. y Troncoso, A.
Asistente/es: Troncoso, A.; Carretero, C.L.; Liñán, J. y Cantos, M.
**Efecto de la micorriza vesiculo arbuscular en la aclimatación de patrones de vid micropropagados.**
Congreso: XX Jornadas de Viticultura y Enología de Tierra de Barros.
Fecha: 05/05/1998 Ciudad: Almendralejo (Badajoz), España
***Código de publicación:*** Oral

Autor/es: Cantos, M.; Esenarro, G.; Liñán, J.; Troncoso, A.
Asistente/es: Troncoso, A.; Carretero, C.L.; Cantos, C.; Liñán, J.
**Efecto del ACR y otros reguladores de crecimiento sobre el desarrollo in vitro de plantas de vid de la variedad Zalema.**
Congreso: XX Jornadas de Viticultura y Enología Tierra de Barros.
Fecha: 05/05/1998 Ciudad: Almendralejo (Badajoz), España
**Código de publicación:** Oral

Autor/es: Bellinfante, N.; Cantos, M.; Salas, E.; Troncoso, A.
Asistente/es: Troncoso, A.; Cantos, M.; Liñán, J.; Carretero, C.L.
**Influencia del fosfato monopotásico en el desarrollo y estado nutritivo de plantas de vid Garrido fino cultivadas in vitro.**
Congreso: XX Jornadas de Viticultura y Enología Tierra de Barros.
Fecha: 05/05/1998 Ciudad: Almendralejo (Badajoz), España
**Código de publicación:** Oral

Autor/es: L. Clemente; F. Cabrera y R. López.
Asistente/es: Luis Clemente, F. Cabrera y R. López.
**Tipología y cartografía de los suelos afectados por lodos en la cuenca del Guadiamar.**
Congreso: Jornadas científicas sobre el vertido tóxico en el entorno de Doñana.
Fecha: 29/09/1998 Ciudad: El Rocío (Huelva), España
**Código de publicación:** Oral

# 5. OTRAS ACTIVIDADES

# 5.1. Cursos, Seminarios y Conferencias

## Cursos

**Autor/es:** C. Saiz-Jimenez, B. Hermosin, L. Laiz, B. Caballero
**Tema: Identificación automática de bacterias (Sistema MIDI)**
**Programa:**
**Fecha:** 09/11/1998 **Lugar:** Sevilla, España

**Autor/es:** Dr. JE Fernández
**Tema: El sistema radicular del olivo y Fertirrigación del olivar**
**Programa:** Master en Olivicultura y Elaiotecnia
**Fecha:** 03/01/1998 **Lugar:** Córdoba, España

**Autor/es:** Dr JE Fernández
**Tema: Cálculos de las necesidades de agua para los cultivos. Optimización del uso del agua**
**Programa:** Curso de doctorado: Insumos de fertilizantes y agua en la agricultura sostenible
**Fecha:** 04/01/1998 **Lugar:** Sevilla, España

**Autor/es:** Dr JE Fernández
**Tema: Optimazing fertilization in a maize crop**
**Programa:** Convenio hispano-israelí de Cooperación en el campo de la desertificación
**Fecha:** 17/12/1998 **Lugar:** Bet Dagan, Israel

**Autor/es:** J.M. Murillo
**Tema: Química del suelo**
**Programa:** 36° Curso Internacional de Edafología y Biología Vegetal
**Fecha:** 03/02/1998 **Lugar:** Sevilla (IRNAS - CSIC), España

**Autor/es:** J.M. Murillo
**Tema: Filosofías de Fertilización. Concepto de calidad del Suelo.**
**Programa:** Medio Ambiente y Tecnología de la Producción
**Fecha:** 02/02/1998 **Lugar:** Sevilla, España

**Autor/es:** J.Jordano
**Tema: Control de la expresión génica -trangenes: diseño y optimización de su expresión en plantas" (Sesiones XI- XIV).**
**Programa:** I Maestría en Biotecnología de Plantas. Sede Iberoamericana de la Universidad Internacional de Andalucía.
**Fecha:** 22/10/1998 **Lugar:** La Rabida (Huelva), España

**Autor/es:** C. Maqueda
**Tema: Mineralogía de Arcillas**
**Programa:** XXXV Curso Internacional de Edafología y Biología Vegetal
**Fecha:** 10/02/1998 **Lugar:** Sevilla, España

**Autor/es:** E. Morillo
**Tema: Caracterización de Minerales de la Arcilla**
**Programa:** XXXV Curso Internacional de Edafología y Biología Vegetal
**Fecha:** 10/02/1998 **Lugar:** Sevilla, España

**Autor/es:** C. Maqueda, L. Madrid y E. Morillo
**Tema: Dinámica de contaminantes en el sistema suelo-agua.**
**Programa:** Programa de Doctorado: Medio Ambiente y Tecnología de la Producción. Departamento de Geología, Cristalografía y Química Agrícola. Universidad de Sevilla.
**Fecha:** 12/03/1998 **Lugar:** Sevilla, España

**Autor/es:** F. Martín & F.J. González-Vila
**Tema: La materia orgánica de los suelos:implicaciones agronómicas y medioambientales**
**Programa:** XXXV Curso Internacional de Edafología y Biología Vegetal
**Fecha:** 01/02/1998 **Lugar:** Sevilla, España

**Autor/es:** F.J. González-Vila
**Tema: Técnicas cromatograficas en el análisis químico ambiental**
**Programa:** Programa de Doctorado "Técnicas analíticas aplicadas en Ingenieria Químca". Dpto. de Ingeniería Química de la Universidad de Sevilla
**Fecha:** 10/05/1998 **Lugar:** Sevilla, España

**Autor/es:** F.J. González-Vila
**Tema: Analisis de contaminación orgánica por cromatografía de gases-espectrometría de masas**
**Programa:** Quimica y Medio Ambiente. Curso de Doctorado del Dpto. de Ingenieria Química de la Universidad de Huelva
**Fecha:** 15/06/1998 **Lugar:** Huelva, España

**Autor/es:** L. Madrid
**Tema: Química del Suelo**
**Programa:** XXXV Curso Internacional de Edafología y Biología Vegetal
**Fecha:** 15/02/1998 **Lugar:** Sevilla, España

**Autor/es:** Arroyo, J., Marañón, T. y Jordano, P.
**Tema: IV Ciclo de Seminarios sobre Ecología y Evolución de las Plantas**
**Programa:** Doctorado en Biología Vegetal y Ecología
**Fecha:** **Lugar:** Sevilla, España

**Autor/es:** F. Cabrera, F. Moreno, J.M. Murillo
**Tema: Input de fertilizantes y agua en la agricultura sostenible**
**Programa:** Medio Ambiente y Tecnología de la Producción "Departamento de Cristalografía, Mineralogía y Química Agrícola", Universidad de Sevilla.
**Fecha:** **Lugar:** Sevilla, España

**Autor/es:** F. Cabrera
**Tema: Producción Agrícola y Conservación del Medio**
**Programa:** Medio Ambiente y Tecnología de la Producción "Departamento de Cristalografía, Mineralogía y Química Agrícola", Universidad de Sevilla.
**Fecha:** **Lugar:** Sevilla, España

**Autor/es:** F. Cabrera
**Tema: Química del Suelo**
**Programa:** XXXV Curso Internacional de Edafología y Biología Vegetal". IRNAS, Sevilla.
**Fecha:** 05/02/1999 **Lugar:** Sevilla, España

**Autor/es:** A. Troncoso, Bellinfante, N. y Cantos, M.
**Tema: Propagación y Nutrición Vegetal.**
**Programa:** Programa de doctorado Medio Ambiente y Tecnología de la Producción.
**Fecha:** 09/03/1998 **Lugar:** Sevilla, España

**Autor/es:** Paneque, G.; Troncoso, A.; Clemente, L.; Bellínfante, N.
**Tema: Producción Agrícola y Conservación del medio.**
**Programa:** Programa de doctorado: Medio Ambiente y Tecnología de la Producción.
**Fecha:** 14/04/1998 **Lugar:** Sevilla, España

**Autor/es:** J.J. Ortega, E. Santero, J. Cornejo, M.C. Hermosin
**Tema: Biodegradación y Biorremediación**
**Programa:** Programa Doctorado Bioquímica y Biología Molecular, Univ. Sevilla
**Fecha:** 01/02/1998 **Lugar:** Sevilla, España

**Autor/es:** Luis Clemente
**Tema: Genesis y clasificación de suelos**
**Programa:** XXXV Curso Internacional de Edafología y Biología Vegetal
**Fecha:** 15/01/1999 **Lugar:** Sevilla, España

**Autor/es:** J. Cornejo, M.C. Hermosín
**Tema: Procesos y mecanismos de contaminación de suelos por compuestos orgánicos**
**Programa:** XXXV Curso Internacional de Edafología y Biología Vegetal
**Fecha:** 20/01/1999 **Lugar:** Sevilla, España

**Autor/es:** J. Cornejo
**Tema: Dinámica de Agroquímicos en suelos**
**Programa:** Programa de Doctorado "Medio Ambiente y Producción Agrícola" – Universidad de Sevilla
**Fecha:** 15/05/1998 **Lugar:** Sevilla, España

**Autor/es:** Marañón, T. y Aparicio A.
**Tema: Biodiversidad y conservación de ecosistemas mediterráneos**
**Programa:** Doctorado en Medio Ambiente y Tecnología de la Producción
**Fecha:** **Lugar:** Sevilla, España

**Autor/es:** F. Cabrera
**Tema: Metales pesados en el ciclo hidrológico**
**Programa:** Ingeniería Química. Departamento de Ingeniería Química, Química Física y Química Orgánica, Universidad de Huelva.
**Fecha:** **Lugar:** Huelva, España

## Seminarios

**Autor/es:** Dr JE Fernández
**Tema: Técnicas de medida usadas en los estudios orientados a la optimización del uso del agua y de los fertilizantes**
**Programa:** Visita de los alumnos de la EUITA de Sevilla a la finca La Hampa
**Fecha:** 19/05/1998 **Lugar:** Sevilla, España

**Autor/es:** Dr JE Fernández
**Tema: La estación agrometeorológica**
**Programa:** Visita de los alumnos de la Facultad de Geografía de la Univ. de Sevilla a la finca La Hampa
**Fecha:** 20/05/1998 **Lugar:** Sevilla, España

**Autor/es:** J.Jordano
**Tema: Regulation of small heat stress genes during zygotic embryogenesis of sunflower**
**Programa:** SFB 474, Intrazelluläre Organisation von Regulations- und Transportprozessen. Johann Wolfgang Goethe-Universität Frankfurt am Main. Biozentrum Niederursel
**Fecha:** 10/07/1998 **Lugar:** Frankfurt am Mein, Alemania

**Autor/es:** Dr. F. Moreno
**Tema: Measurement of the soil water content using TDR and neutron probe in tillage experiments in Spain**
**Programa:** Consultants' Meeting of the Joint FAO/IAEA Division of nuclear technique in Food and Agriculture on "The comparison of three soil water content assessment methods"
**Fecha:** 23/11/1998 **Lugar:** Viena, Austria

**Autor/es:** A. Troncoso
**Tema: Cultivo in vitro de vid**
**Programa:** Dep. Microbiología. Facultad de Biología. Universidad de Sevilla.
**Fecha:** **Lugar:** Sevilla, España

**Autor/es:** J. Cornejo
**Tema: Dinámica de Contaminantes Orgánicos en Suelos**
**Programa:** Principios básicos para la gestión de suelos contaminados. Fundación Juan Cámara. Facultad de Química. Universidad de Sevilla
**Fecha:** 05/03/1998 **Lugar:** Sevilla, España

## Conferencias

**Autor/es:** F.J. González-Vila
**Tema: Aspectos químicos de las diversas alternativas utilizadas en la gestión medioambiental de Residuos Sólidos Urbanos**
**Programa:** Química y Gestión Medioambiental.Fundación Cámara. Facultad de Química
**Fecha:** 18/02/1998 **Lugar:** Sevilla, España

**Autor/es:** F. Cabrera
**Tema: Los sedimentos y la calidad de las aguas**
**Programa:** Química y Gestión Medioambiental. Fundación Cámara. Facultad de Química. Universidad de Sevilla.
**Fecha:** **Lugar:** Sevilla, España

**Autor/es:** M. Cantos
**Tema: Limpieza de virus en vid mediante cultivo de meristemo y termoterapia "in vitro".**
**Programa:** Ciclo de Conferencias sobre control de plagas. Laboratorio de Zoología Aplicada. Dpto. de Fisiología y Biología Animal. Universidad de Sevilla.
**Fecha:** 17/06/1998 **Lugar:** Sevilla, España

**Autor/es:** J. Cornejo
**Tema: Efectos de los vertidos de las minas de Aznalcollar en el entorno de Doñana.**
**Programa:** Ciclo Medio Ambiente. CAM.
**Fecha:** 02/07/1998 **Lugar:** Alicante, España

**Autor/es:** J. Cornejo
**Tema: The effect of soil colloid associations in pesticide retention.**
**Programa:** XVI Convegno Nazionale de SICA. Conferencia invitada
**Fecha:** 02/10/1998 **Lugar:** Revegno, Italia

## 5.2. Estancias en otros centros de personal del IRNAS

**Investigador:** Dr. JE Fernández
**Organismo:** CNR-CSIC
**Programa:** Cooperación bilateral CSIC-CNR
**Fecha Inicio:** 07/06/1998 **Fecha Finalización:** 20/06/1998
**Ciudad de estancia:** Nápoles, Italia

**Investigador:** Dr. JE Fernández
**Organismo:** CSIC-Academia de Ciencias de Polonia
**Programa:** Cooperación bilateral CSIC-Academia de Ciencias de Polonia
**Fecha Inicio:** 09/11/1998 **Fecha Finalización:** 15/11/1998
**Ciudad de estancia:** Lublin, Polonia

**Investigador:** Dr. JE Fernández
**Organismo:** CSIC
**Programa:** Cooperación con Israel en el campo de la Desertificación
**Fecha Inicio:** 14/12/1998 **Fecha Finalización:** 20/12/1998
**Ciudad de estancia:** Bet Dagan, Israel

**Investigador:** E.O. Leidi
**Organismo:** Department of Agronomy, University of Arkansas
**Programa:** Grupos de Investigación, Junta de Andalucía
**Fecha Inicio:** 09/06/1998 **Fecha Finalización:** 21/06/1998
**Ciudad de estancia:** Fayetteville, Arkansas, EE.UU.

**Investigador:** Rafael Sarmiento
**Organismo:** Institut für Pflanzenernährung. Universität Hohenheim
**Programa:** International Colloquium on Plant Nutrition
**Fecha Inicio:** 13/02/1998 **Fecha Finalización:** 14/02/1998
**Ciudad de estancia:** Stuttgart, Alemania

**Investigador:** Anabel Rojas González
**Organismo:** Dept. Biology, Texas A&M University
**Programa:** Beca de estancia corta en el extranjero del PFPI
**Fecha Inicio:** 01/08/1998 **Fecha Finalización:** 23/10/1998
**Ciudad de estancia:** College Station,, USA

**Investigador:** Pablo Arambarri
**Organismo:** C.S.I.C.
**Programa:** Internacional
**Fecha Inicio:** **Fecha Finalización:**
**Ciudad de estancia:** Sofia, Bulgaria

**Investigador:** M.Carmen Hermosin Gaviño
**Organismo:** CNRS-Universite Blaise-Pascal
**Programa:** Acción Integrada HF96-0084
**Fecha Inicio:** 02/11/1998 **Fecha Finalización:** 08/11/1998
**Ciudad de estancia:** Clermont Ferrand, Francia

**Investigador:** Juan Cornejo
**Organismo:** CNRS-Universté Blaise-Pascal
**Programa:** Acción Integrada HF97-0084
**Fecha Inicio:** 02/11/1998 **Fecha Finalización:** 08/11/1998
**Ciudad de estancia:** Clermont-Ferrand, Francia

**Investigador:** M. Jose Carrizosa
**Organismo:** Deparment Of Soil, Water & Climate, University of Minneapolis
**Programa:** Beca Predoctoral del PFPI
**Fecha Inicio:** 12/09/1998 **Fecha Finalización:** 12/12/1998
**Ciudad de estancia:** St. Paul, Minnessota, EE.UU.

**Investigador:** R. Celis
**Organismo:** Department Soil, Water & Climate, University of Minneapolis
**Programa:** Beca Postdoctoral PPDT
**Fecha Inicio:** 13/01/1998 **Fecha Finalización:** 21/12/1998
**Ciudad de estancia:** St. Paul, Minnessota, EE.UU.

**Investigador:** Dr. F. Moreno
**Organismo:** Academia de Ciencias de Polonia-Instituto de Agrofísica
**Programa:** Cooperación bilateral CSIC-Academia de Ciencias de Polonia
**Fecha Inicio:** 09/11/1998 **Fecha Finalización:** 15/11/1998
**Ciudad de estancia:** Lublin, Polonia

**Investigador:** Dr. F. Moreno
**Organismo:** The Volcani Center, ARO
**Programa:** Convenio de cooperación con Israel en el campo de la lucha contra la desertización
**Fecha Inicio:** 25/10/1998 **Fecha Finalización:** 31/10/1998
**Ciudad de estancia:** Tel Aviv (Bet Dagan), Israel

**Investigador:** Dr. F. Moreno
**Organismo:** IAV-Rabat(Marruecos)
**Programa:** Proyecto INCO: IC-18-CT96-0091
**Fecha Inicio:** 12/03/1998 **Fecha Finalización:** 18/03/1998
**Ciudad de estancia:** Rabat, Marruecos
**Investigador:** Dr. F. Moreno
**Organismo:** ACSSAD
**Programa:** Proyecto INCO: IC18-CT96-0091
**Fecha Inicio:** 20/04/1998 **Fecha Finalización:** 25/04/1998
**Ciudad de estancia:** Damasco, Siria

**Investigador:** A. Troncoso
**Organismo:** Institut für Pflanzenernährung. Universität Hohenheim.
**Programa:** International Colloquium on Plant Nutrition.
**Fecha Inicio:** 13/02/1998 **Fecha Finalización:** 14/02/1998
**Ciudad de estancia:** Stuttgart, Alemania

**Investigador:** M. Lahlou
**Organismo:** Federal Institute for Environmental Science and Technology (EAWAG-ETH)
**Programa:** Cooperación CSIC-ETH Zürich
**Fecha Inicio:** 01/04/1998 **Fecha Finalización:** 30/06/1998
**Ciudad de estancia:** Zürich, Suiza

**Investigador:** A. Troncoso
**Organismo:** Istituto sulla Propagazione delle Specie Legnose. (Consiglio Nazionale delle Ricerche (C.N.R.)
**Programa:** "Convenio Marco de Coperación Científica entre CSIC y CNR.
**Fecha Inicio:** 03/09/1998 **Fecha Finalización:** 18/09/1998
**Ciudad de estancia:** Florencia, Italia

**Investigador:** José L. García Fernández.
**Organismo:** Istituto sulla Propagazione delle Specie Legnose. Consiglio Nazionale delle Ricerche. (C.N.R.)
**Programa:** "Convenio Marco de Cooperación Científica" entre CSIC y CNR
**Fecha Inicio:** 15/05/1998 **Fecha Finalización:** 30/05/1998
**Ciudad de estancia:** Florencia, Italia

## 5.3. Estancias en el IRNAS

**Investigador:** Dr. A Nadler
**Organismo:** The Volcani Center, ARO
**Programa:** Convenio de Cooperación con Israel en el campo de la desertificación
**Fecha Inicio:** 21/11/1998 **Fecha Finalización:** 17/11/1998
**Ciudad de origen:** Israel

**Investigador:** Prof. Giorgio Bartolini
**Organismo:** Istituto sulla Propagazione delle Specie Legnose. Consiglio Nazionale delle Ricerche (C.N.R.)
**Programa:** "Convenio Marco de Cooperación Científica" entre el CSIC y el CNR.
**Fecha Inicio:** 15/03/1998 **Fecha Finalización:** 30/03/1998
**Ciudad de origen:** Florencia, Italia

**Investigador:** Dr. Jean-Pierre Aguer
**Organismo:** CNRS-Universite Blaise Pascal
**Programa:** Acción Integrada HF97-0084
**Fecha Inicio:** **Fecha Finalización:**
**Ciudad de origen:** Clermont-Ferrand, Francia

**Investigador:** Peter J. Grubb
**Organismo:** Universidad de Cambridge, Inglaterra
**Programa:** Proyecto CICYT
**Fecha Inicio:** 25/03/1998 **Fecha Finalización:**
**Ciudad de origen:**

**Investigador:** Inga Nagel
**Organismo:** Institut für Bodenkunde und Standorslehre.
**Programa:** Vertido Aznalcóllar
**Fecha Inicio:** 17/10/1998 **Fecha Finalización:** 02/12/1998
**Ciudad de origen:** Stuttgard., Alemania

**Investigador:** Prof. Martin Kaupejohann
**Organismo:** Institut für Bodenkunde und Standorslehre.
**Programa:** Vertido Aznalcóllar
**Fecha Inicio:** **Fecha Finalización:**
**Ciudad de origen:** Sttutgark., Alemania

**Investigador:** Prof. Ulrich Schmidt
**Organismo:** Institut für Bodenkunde und Standorslehre.
**Programa:** Vertido Aznalcóllar
**Fecha Inicio:** 16/09/1998 **Fecha Finalización:** 17/09/1998
**Ciudad de origen:** Sttutgart, Alemania

**Investigador:** Prof. Umberto Tomati
**Organismo:** CNR Istituto Biochimica & Ecofiologia Vegetale
**Programa:** Visita Instituto
**Fecha Inicio:** 11/11/1998 **Fecha Finalización:**
**Ciudad de origen:** Roma, Italia

**Investigador:** Prof. Dr. R. Walczak ; Dr. C. Slawinski
**Organismo:** Academia de Ciencias de Polonia-CSIC
**Programa:** Cooperación bilateral CSIC-Academia de Ciencias de Polonia
**Fecha Inicio:** 07/12/1998 **Fecha Finalización:** 12/12/1998
**Ciudad de origen:** Polonia

**Investigador:** AnnaRita Leva
**Organismo:** Istituto sulla Propagazione delle Specie Legnose. Consiglio Nazionale della Ricerche (C.N.R.)
**Programa:** "Convenio Marco de Cooperación Científica" entre CSIC y CNR.
**Fecha Inicio:** 01/07/1998 **Fecha Finalización:** 15/07/1998
**Ciudad de origen:** Florencia, Italia

**Investigador:** Elina Petrova Iankova
**Organismo:** Institute of Botany. Bulgarian Academy of Sciences.
**Programa:** Beca Predoctoral de la Dirección General de Relaciones Culturales y Científicas. Ministerio de Asuntos Exteriores.
**Fecha Inicio:** 01/01/1998 **Fecha Finalización:** 30/06/1998
**Ciudad de origen:** Sofia, Bulgaria

**Investigador:** Dr. B. Heuer
**Organismo:** CSIC-IRNAS
**Programa:** Convenio de cooperación con España en el campo de la lucha contra la desertización
**Fecha Inicio:** 01/12/1998 **Fecha Finalización:** 08/12/1998
**Ciudad de estancia:** Sevilla, España

# 5.4. Participación en Tribunales

## 5.4.1. Tribunales de Tesis

**Investigador:** Dr JE Fernández
**Nombramiento:** Vocal
**Doctorando:** Pablo González Altozano
**Título:** Riego deficitario controlado en Clementina de Nules
**Facultad:** ETSI Agrónomos y de Montes
**Universidad:** Valencia
**Fecha:** 02/11/1998

**Investigador:** J.C. del Río
**Nombramiento:** Vocal
**Doctorando:** Roser Gorchs Altarriba
**Título:** Geoquímica Orgànica de carbons rics en sofre
**Facultad:** Escola Universitària Politècnica de Manresa
**Universidad:** Universitat Politècnica de Catalunya
**Fecha:** 21/07/1998

**Investigador:** Juan Jordano
**Nombramiento:** Vocal
**Doctorando:** José Ignacio Piruat Palomo
**Título:** Relación de la transcripción con la recombinación entre secuencias repetidas en Sacharomyces cerevisiae
**Facultad:** Facultad de Biología, Departamento de Genética
**Universidad:** Universidad de Sevilla
**Fecha:** 05/06/1998

**Investigador:** C. Maqueda
**Nombramiento:** vocal
**Doctorando:** J. I. Pérez Martínez
**Título:** Obtención y caracterización de complejos de inclusión del ácido 2,4-diclorofenoxiacético con ciclodextrinas: aplicación a la descontaminación de suelos.
**Facultad:** Farmacia
**Universidad:** Sevilla
**Fecha:** 19/06/1998

**Investigador:** L. Madrid
**Nombramiento:** Vocal
**Doctorando:** D. José Antonio Soto Acosta
**Título:** Formas de fósforo y su liberación en andisoles de la región central oriental de Costa Rica
**Facultad:** Escuela Técnica Superior de Ingenieros Agrónomos y de Montes
**Universidad:** Córdoba
**Fecha:** 08/11/1998

**Investigador:** F. Cabrera
**Nombramiento:** Vocal
**Doctorando:** Verónica Saenz Aurrecoechea
**Título:** Distribución espacial y especiación de metales en tres sistemas litorales del Golfo de Cádiz
**Facultad:** Facultad de Ciencias del Mar.
**Universidad:** Universidad de Cádiz
**Fecha:** 07/07/1998

## 5.4.2. Tribunales de Oposiciones

**Investigador:** J.C. del Río
**Nombramiento:** Vocal
**Título:** Aplicaciones Analíticas de la Espectrometría de Masas a la Química Ambiental
**Facultad:** C.S.I.C.
**Universidad:**
**Fecha:** 05/10/1998

**Investigador:** F. Moreno
**Nombramiento:** Vocal
**Título:** "Nutrición mineral de plantas: Absorción de nutrientes y agua" y "Producción vegetal: Pastos"
**Facultad:** CSIC
**Universidad:**
**Fecha:** 19/10/1998

**Investigador:** F. Moreno
**Nombramiento:** Vocal
**Título:** "Dinámica de agua y solutos en el suelo"
**Facultad:** CSIC
**Universidad:**
**Fecha:** 19/11/1998

**Investigador:** Luis Clemente Salas
**Nombramiento:** Vocal
**Título:** Titulados Superiores (9 plazas)
**Facultad:** Ministerio de Medio Ambiente
**Universidad:**
**Fecha:**

## 5.5. Reconocimientos

**Investigador:** Dr. JE Fernández
**Actividad:** Nombrado miembro del "Consulting Editorial Board" de "Plant and soil"
**Fecha:** 15/12/1998

**Investigador:** Dr. F. Cabrera
**Actividad:** Vocal de la Comisión de Expertos para la evaluación de proyectos de investigación y desarrollo del Programa Nacional de I+D Agrario (Area Agricultura)
**Fecha:**

# 6. INFRAESTRUCTURA Y SERVICIOS

# 6.1 Dotación Instrumental más importante

## Departamento de Geoecología

| | |
|---|---|
| *Estación de teledetección* | *Interpro 360* |
| *Radiómetro* | *Barriguer* |
| TDR | Tectronic |
| Sensor CE cuatro electrodos | Martek |
| Sensor EM | Geonic Em38 |
| Barrena sondeos geológicos | |
| Juego barrena campo | |
| Preparación láminas delgadas | |
| Microscopio polarográfico – TV | Zeiss |
| Medidor área foliar | Sky |

## Departamento de Química de Interfases en Procesos Medioambientales

| | |
|---|---|
| Supercentrífuga | Beckman JC-21 |
| Incubadores orbitales (dos) | New Brunswick |
| Polarógrafo | Metrohm 646 |
| Centrífuga | Kontron H-401 |

## Departamento de Biogeoquímica y Dinámica de Contaminantes

| | |
|---|---|
| Equipo de cromatografía | Waters |
| Cromatógrafo de gases – espectómetro de masas MD 800 | Firsons |
| Unidad de pirólisis | Fisher |
| Unidad de pirólisis | Horizon |
| Sonicador | Sorvall |
| Cromatógrafo de gases-espectómetro de masas | Hewlett-Packard |
| Cromatógrafo de gases-detector ECD | Hewlett-Packard |
| Cromatógrafo de gases-detector FPD | Hewlett-Packard |
| Cromatógrafo de gases-detector NPD | Hewlett-Packard |
| Unidad de pirólisis | Pyroprobe |
| Porosímetro Hg y medidor superficies Específicas | Fisons |
| Cromatógrafo HPLC con detector UV e inyector automático | Waters |
| Incubador orbital | New Brunswick Scientific |
| Cromatógrafo de gases | Hewlett-Packard |
| Cromatógrafo de gases/ espectrómetro de masas voyage | Finnigan |
| Cromatógrafo de HPLC I Plus con detector de índice de | |

| | |
|---|---|
| Refracción UV e inyector automático | Waters |
| Cromatógrafo de gases con detector FID e inyector automático | Hewlett-Packard |
| Cromatógrafo de HPL con detectores UV y fluorescencia e inyector automático | Waters |
| Cabina Flujo laminar | Microflow |

## *Departamento de Sostenibilidad del Sistema Suelo-Planta-Atmósfera*

| | |
|---|---|
| Equipo de medida de flujos | Hortresearch |
| Espectrofotómetro V-UV | Beckman DU-65 |
| Valorador automático | Radiometer Copenhagen |
| Cromatógrafo iónico con detectores de CE y UV, inyector automático estación de control | Waters |
| Horno mufla | Heraeus |
| Incubador | Selecta |
| Incubador | Ralpa |
| Ionómetro | *Metrohm* |
| Equipo de Digestión y Destilación de Nitrógeno | Tecator |
| Estufa secado de plantas | WT Binder |
| *Sonda de neutrones* | Troxler |
| Sistema de posicionamiento global | Trimble |
| Super Centrífuga RC-5C | Sorvall RC 5B Plus |
| TDR | Tektronix |

## Departamento de Biología Vegetal

| | |
|---|---|
| *Cámara flujo laminar* (3) | Telstar |
| Autoclave (2) | Austester |
| Microscopio | Olympus |
| Lupa binocular | Olympus |
| Centrífuga | Heraeus |
| Termocicladores (3) | MJ Research |
| Congelador (-80ºC) | Heraeus |
| Incubador orbital (2) | New Brunswick |
| Cámara de plantas | ASL |
| Ultracentrífuga | Kontron Centrikon T-2080 |
| Arcón congelador (-80ºC) | Reuco |
| Espectrofotómetro V-UV | Milton Roy |
| Cromatógrafo HPLC con detectores UV y DR | Waters |
| Autoanalizador | Technicon |
| Horno mufla | Heraeus M110 |
| Centrífuga | Sorvall RC2-B |
| Sistema de Bombardeo de partículas Biolistic PDS-1000/He | Biorad |
| Luminómetro | Turner |

## Equipos Generales

| | |
|---|---|
| Espectrofotómetro Absorción Atómica | Perkin Elmer 703 |
| Espectrofotómetro Absorción Atómica | Perkin Elmer 1100B |
| Espectrofotómetro ICP-OES | Thermo - Jarrell |
| Cámara de grafito | HG A400 |
| Generador de hidruros | MHS 10 |
| Contador de centelleo | Beckman |
| Generador de rayos X | Siemens |
| Generador de rayos X | Philips |
| Fluorescencia rayos X | Siemens RS |
| Extractor fluidos hipercríticos | Fisons |
| Liofilizador | Virtis |
| Estación meteorológica automatizada | Lambretch |
| Espectroscopio IR-FT | Nicolet 500 D |
| Secuenciador ADN | |
| Molino | Retsch SM1 |
| Molino | IKA MS10 |
| Equipo digestión por microondas | Milestone ETHOS900 |

# 6.2. Biblioteca

La Biblioteca del Instituto de Recursos Naturales y Agrobiología de Sevilla forma parte de la Red de Bibliotecas del Consejo Superior de Investigaciones Científicas. Posee una colección especializada en las áreas de Recursos Naturales, Suelos, Ecología vegetal y Teledetección, y cuenta con 4.691 libros y 162 títulos de revistas de los cuales, 67 se reciben actualmente.

Si bien los servicios ofrecidos por la Biblioteca están dirigidos principalmente al personal investigador del Centro, el acceso es libre para el público en general.

**LECTURA EN SALA**

La sala de lectura, de acceso libre, cuenta con seis puestos de lectura y dispone de un terminal de ordenador para usuarios conectado a los catálogos automatizados de la Red de Bibliotecas del CSIC.

**PRÉSTAMO PERSONAL**

Para acceder a este servicio es imprescindible disponer de un carnet de préstamo de cualquiera de las bibliotecas pertenecientes a la Red de Bibliotecas del Consejo Superior de Investigaciones Científicas.

El préstamo personal está restringido al personal del CSIC.

No se prestan las obras de referencia, tesis doctorales, publicaciones periódicas y seriadas, material, no librario y libros antiguos o especialmente valiosos.

**INFORMACIÓN BIBLIOGRÁFICA**

Además de ofrecer información sobre el funcionamiento de la Biblioteca y sobre fondos propios, se puede obtener información sobre fondos y servicios de la Red de Bibliotecas del CSIC

**PRÉSTAMO INTERBIBLIOTECARIO**

En la actividad del Préstamo Interbibliotecario hay que destacar el crecimiento de intercambio de información entre las Bibliotecas, tanto en fotocopias de artículos como préstamo de libros.

En el año 1.998 la recepción de trabajos solicitados a otras Bibliotecas se ha agilizado considerablemente debido a que la mayoría de los Institutos cuentan con el programa ARIEL y se recibe a través de correo electrónico.

**FONDO BIBLIOTECARIO**

El fondo bibliográfico en 1.998 ha aumentado con la compra de 48 monografías.

El listado de revistas (suscripciones vivas) cuenta con 13 nuevos títulos que se reciben en los Departamentos.

**Correo-e: bibirna@cica.es**

## BIBLIOTECA-IRNAS
## Relación de suscripciones vivas/Colección

| REVISTA | ISSN | COLECCION |
|---|---|---|
| Agricultural and forest meteorology | 0168-1923 | 1984- |
| Agricultural water management | 0378-3774 | 1982- |
| Agriculture, ecosystems and environment | 0167-8809 | 1996- |
| Agronomy journal | 0002-1962 | 1963-73(74)75- |
| Applied and environmental microbiology | 0099-2240 | 1996- |
| Australian journal of agricultural research | 0004-9409 | 1973- |
| Australian journal of soil research | 0004-9573 | 1973-93(94-95)96- |
| Biotechnology | 0733-222X | 1987- |
| Boletín de información agraria y pesquera | | 1988- |
| Boletín de sanidad vegetal. Plagas | 0213-6910 | 1986- |
| Byte | 1135-0407 | 1997- |
| California agriculture | 0008-0845 | 1981- |
| Catena | 0341-8162 | 1977- |
| Clays and clay minerals | 0009-8604 | 1968- |
| Clays minerals | 0009-8558 | |
| Communications in soil science and plant analysis | 0010-3624 | 1971-75(76-77)78- |
| Cuadernos de geología ibérica | 0378-102X | 1970- |
| Current contents on diskette. Agric., biol. and environ. | 1062-3167 | 1993- |
| Current protocols in molecular biology | | |
| EMBO journal | 0261-4189 | 1987- |
| Environmental science and technology | 0013-936X | 1991-95(96)97- |
| European journal of agronomy | | |
| European journal of soil science | 1351-0754 | 1994- |
| Genes and development | 0890-9369 | 1991- |
| Geoderma | 0016-7061 | 1967-92(93)94- |
| Geomicrobiology journal | | |
| Información meteorológica | | |
| International journal of development | | |
| International journal of remote sensing | 0143-1161 | 1990- |
| Investigación y ciencia | 0210-136X | (1976)77- |
| Irrigation science | 0342-7188 | 1981- |
| Journal of environmental quality | 0047-2425 | 1990- |
| Journal of plant nutrition | 0190-4167 | (1979-80)81- |
| Journal of sustainable agriculture | 1044-0046 | 1995- |
| Journal of the american society for horticultural scien. | 0003-1062 | 1969-73(74)75- |
| Macworld | | |
| Molecular medicine today | 1357-4310 | |
| Montes | 0027-0105 | |
| Nature | 0028-0836 | 1987- |
| Nature medicine | 1078-8956 | |
| Netherlands journal of agricultural science | 0028-2928 | 1964- |
| New phytologist | 0028-646X | 1990- |
| Nucleic acids research | 0305-1048 | 1991- |
| Organic geochemistry | 0146-6380 | |
| Physiologia plantarum | 0031-9317 | 1982- |
| Plant and soil | 0032-079X | 1964-1994,96- |
| Plant biology | 1435-8603 | |
| Plant cell, The | 1040-4651 | 1989(90)91- |
| Plant cell and environment | 0140-7791 | 1990- |
| Plant cell reports | 0721-7714 | 1987- |
| Plant cell tissue and organ culture | 0167-6857 | 1989- |

| | | |
|---|---|---|
| Plant journal, The | 0960-7412 | 1991- |
| Plant molecular biology | 0167-4412 | 1987- |
| Plant molecular biology report | 0735-9640 | |
| Plant physiology | 0032-0889 | 1988- |
| Plant physiology and biochem. | 0981-9428 | 1987-94,96- |
| PNA (on line) | | |
| Químicos del Sur | | 1983- |
| Science | 0036-8075 | 1992- |
| Scientia horticulturae | 0304-4238 | 1973- |
| Seminarios de estratigrafía | 0375-7609 | 1969- |
| Soil and tillage research | 0167-1987 | 1987- |
| Soil science | 0038-075X | 1953-93(94)95- |
| Soil science society of american journal | 0361-5995 | 1976-88(89)90- |
| Soil use and management | 0266-0032 | 1991- |
| Soils and fertilizers | 0038-0792 | 1954- |
| Trends in biochemical sciences | 0376-5067 | |
| Trends in genetics | 0968-9525 | |
| Trends in plant science | 1360-1385 | |
| Water research | 0043-1354 | 1986- |
| Zeitschrift fur pflanzenernahrung und bodenkunde | 0044-3263 | 1968-91(92)93-94,96- |

## 6.3. Red informática local:

La red instalada en el **IRNAS** es una Novell, versión 4.11, con licencia para 100 usuarios. Esta red está unida al Centro de Informática Científica de Andalucía (CICA), que proporciona al Instituto el servicio de correo electrónico y la conexión a Internet.

Los servidores Web y FTP del Instituto, que funcionan bajo el sistema Linux, se encuentran en las direcciones http://www.irnase.csic.es y ftp://irnase.csic.es respectivamente.

**Periféricos:**

- Grabador de diapositivas: Este dispositivo permite grabar diapositivas con la información contenida en ficheros electrónicos. Estos ficheros pueden ser de distintos formatos (*.bmp, *.gif, *.pcx, *.tif, etc.).
- Digitalizador. Permite documentos de tamaño máximo DIN A3 e incluso diapositivas.
- Impresora Láser Color de red.
- Trazador. Permite la impresión en color de gráficos en los formatos DIN A4, A3, A2, A1 y A0, lo que equivale a un tamaño de papel máximo de 914 x 1300 mm.

# 6.4. Asistencia técnica

**RESUMEN DE LAS ACTIVIDADES DEL SERVICIO DE ANALISIS DURANTE 1998.**

Durante 1.998 se han realizado análisis de

- 1156 muestras de suelo, 387 correspondientes a muestras exteriores y 769 de diversos proyectos del Instituto
- 239 muestras de aguas (caracterización para riego y residuales)
- 37 muestras de abonos y enmiendas orgánicas
- 1089 muestras de plantas

La facturación exterior por análisis fue de 1.844.240 ptas. (IVA no incluido)

El Servicio ha colaborado con las siguientes empresas e Instituciones:

- ABORGASE
- AIMCRA
- Federación de Arroceros de Sevilla
- CIFA Las Torres
- ETSIA Univ. Castilla La Mancha, Albacete
- Servicio de Análisis del Instituto de la Grasa
- Estación Biológica de Doñana (Dr. Carlos Herrero)

Y con los siguientes Proyectos o Investigadores del Instituto:

- XXXV Curso Internacional de Edafología, y Proy. ICONA-Islas Chafarinas, Dr. Luis Clemente
- Proyecto "Utilización de Aguas Residuales de Aceitunas Negras en Riego de Olivar" (ASEMESA), Dr. J. Manuel Murillo
- Proyecto "Utilización de Compost de RSU" (AMA), Dr. Rafael López
- Proyectos "Sustratos Orgánicos en Cultivos de Fresón y Naranjo" y "Contaminación Río Guadiamar", Dr. Francisco Cabrera
- Proyectos "Obtención y Evaluación de Plantas de Olivo Tolerantes a la Salinidad mediante Empleo de Métodos Biotecnológicos" y "Fertirrigación del Olivo", Dr. Antonio Troncoso
- Proyecto "Bosque Mediterráneo", Dr. Teodoro Marañón
- Proyecto "Mejora Genética del algodón", Dr. Eduardo Leidi
- Proyecto "Forestal", Dr. Juan Cornejo
- Proyecto AFREXPORT, Dr. Pablo Arambarri

Durante 1.998 el Servicio de Análisis ha continuado con su participación en los programas IPE de control de calidad de los resultados de análisis de plantas, MARSEP de control de calidad en análisis de compost y enmiendas orgánicas integrados ambos en WEPAL (Programas de Evaluación de Laboratorios Analíticos de Wageningen) y se ha iniciado la participación en el programa INTER 2000 (Departament d'Agricultura, Generalitat de Catalunya) de suelos y aguas.

Asimismo, durante 1.998 ha instalado y puesto a punto un espectrofotómetro de plasma óptico (Termo Jarrell, mód. IRIS-Advantage).

## 6.5. Finca experimental:

Como en años anteriores, la experimentación en "La Hampa" ha incluido proyectos de investigación, tesis doctorales, Curso Internacional de Edafología y Biología Vegetal y trabajos fin de carrera.

Destacan los siguientes:

- Obtención de olivos tolerantes a la salinidad por métodos biotecnológicos.
- Arcillas, organoarcillas e hidrotalcitas como portadores de plaguicidas polares para minimizar su impacto ambiental.
- Movilidad de plaguicidas en suelos: efecto de su interacción con asociaciones coloidales y de la adición de residuos orgánicos en la reducción y contaminación de aguas superficiales y subterráneas.
- Conservación del suelo y movilidad de herbicidas bajo laboreo tradicional y de conservación en agricultura de secano.
- Respuesta del olivo al riego deficitario. Utilización de indicadores biológicos para la optimización del riego.

Han visitado la finca, entre otros, investigadores de España, Israel, Nueva Zelanda y alumnos de Facultades Universitarias y Escuelas Técnicas.

Las inundaciones de los años 96 y 97, provocadas por el desbordamiento del río Pudio, han inutilizado el pozo principal de la finca lo que ha obligado a un nuevo sondeo dotándolo de nueva motobomba, cuadro eléctrico y contador volumétrico.

# 7. RECURSOS HUMANOS

# 7.1. Personal

**Director:** Prof. Dr. D. Juan Cornejo Suero
**Vicedirector Area Ciencias Agrarias:** Dr. D. Francisco Cabrera Capitán
**Vicedirector Area de Recursos Naturales:** Dr. D. José Carlos del Río Andrade
**Gerente:** Ing. D. Jesús Prieto Alcántara

## DPTO 1: GEOECOLOGIA

| **Personal Funcionario** | **Categoría** |
|---|---|
| Clemente Salas, Luis | Investigador Científico |
| Marañón Arana, Teodoro | Colaborador Científico |
| Olmedo Pujol, Juan Luis | Colaborador Científico |
| Siljeström Ribed, Patricia Astrid | Colaborador Científico |
| García Fernández, Luis Ventura | Titulado Superior Especializado |
| Ayerbe Sales, María | Titulado Técnico Especializado |
| Martín González, Carmen | Ayudante de Laboratorio |

| **Personal Laboral Fijo** | **Categoría** |
|---|---|
| Alegre Rodríguez, José María | Ayudante Técnico de Laboratorio |

| **Personal Laboral Contratado** | **Categoría** |
|---|---|
| Moreno López, Adela | Titulado Superior / I (P. Siljeström) |

## DPTO 2: QUIMICA DE INTERFASES EN PROCESOS MEDIOAMBIENTALES

| **Personal Funcionario** | **Categoría** |
|---|---|
| Madrid Sánchez del Villar, Luis | Investigador Científico |
| Maqueda Porras, Celia | Investigador Científico |
| Montaño Asquerino, Juan Carlos | Investigador Científico |
| Díaz Barrientos, Encarnación | Colaborador Científico |
| Morillo González, Mª Esmeralda | Colaborador Científico |

| **Personal Laboral Fijo** | **Categoría** |
|---|---|
| Gayurt Romero, Francisco | Ayudante Técnico de Laboratorio |

| **Personal Laboral Contratado** | **Categoría** |
|---|---|
| Cert Trujillo, Mª Rosa | Ayte. T. Lab. / III (C. Maqueda) Int |

| **Personal Becario** | **Categoría** |
|---|---|
| Pérez Martínez, José Ignacio | Postdoctoral CSIC (C. Maqueda) |
| Ruiz Cortés, Eduardo | Predoctoral (L. Madrid) |

# DPTO. 3: BIOGEOQUIMICA Y DINAMICA DE CONTAMINANTES

| **Personal Funcionario** | **Categoría** |
|---|---|
| Cornejo Suero, Juan | Profesor de Investigación |
| Martín Martínez, Francisco | Profesor de Investigación |
| Sáiz Jiménez, Cesáreo | Profesor de Investigación |
| Del Río Andrade, José Carlos | Investigador Científico |
| González Vila, Francisco Javier | Investigador Científico |
| Hermosín Gaviño, Carmen | Investigador Científico |
| Ortega Calvo, José Julio | Colaborador Científico |
| Hermosín Campos, Bernardo | Titulado Técnico Especializado |
| Verdejo Robles, Trinidad | Ayudante de Investigación |

| **Personal Laboral Fijo** | **Categoría** |
|---|---|
| García Albelda, Juan Francisco | Ayudante Técnico de Laboratorio |
| Martínez Durán, Antonio | Ayudante Técnico de Laboratorio |

| **Personal Laboral Contratado** | **Categoría** |
|---|---|
| Cox Meana, Lucía Gracia | Inv. Contratado / I (J. Cornejo) |
| Calderón Reina, Mª Jesús | Ayte Lab. / V (M.C. Hermosín) |

| **Personal Becario** | **Categoría** |
|---|---|
| Gutiérrez Suárez, Ana | Postdoctoral (F.J. González) |
| Láiz Trobajo, Leonila | Postdoctoral (C. Sáiz) |
| Carrioza Vila, Mª José | FPI MEC (C. Hermosín) |
| Felske, Andreas | Formación y Movilidad (C. Saiz) |
| Recio Aguado, Delfina | Int. Investigación (C. Saiz) |
| García-Junco Clemente, Marta | Predoctoral (J.J. Ortega) |
| González Berraquero, Ismael M. | Predoctoral (C. Sáiz) |
| Lahlou, Mohammed | Predoctoral (J.J. Ortega) |

# DPTO. 4: SOSTENIBILIDAD DEL SISTEMA SUELO-PLANTA-ATMOSFERA

| **Personal Funcionario** | **Categoría** |
|---|---|
| De la Rosa Acosta, Diego | Profesor de Investigación |
| Cabrera Capitán, Francisco de Paula | Investigador Científico |
| Moreno Lucas, Félix | Investigador Científico |
| Murillo Carpio, José Manuel | Investigador Científico |
| Fernández Luque, José Enrique | Colaborador Científico |
| Moreno Arce, Juan Antonio | Titulado Técnico Especializado |
| Rodríguez Borrego, José | Ayudante de Investigación |
| Rosales Sánchez, Antonio | Ayudante de Investigación |

| **Personal Laboral Contratado** | **Categoría** |
|---|---|
| Arambarri Cazalis, Pablo | Prof. Ad Honorem |
| Castillo Lorente, Valeria | Tit. Técnico / II (D. De la Rosa) |
| Girón Moreno, Ignacio Francisco | Tit. Técnico / II (F. Moreno) |
| Mayol Rodríguez, Francisco José | Programador / III (D. de la Rosa) |
| Alvarez Castaño, Ana Mª | Aux. Laboratorio (P. Arambarri) |

| **Personal Becario** | **Categoría** |
|---|---|
| Burgos Domenech, Mª Pilar | FPI MEC (F. Cabrera) |
| Díaz Espejo, Antonio | FPI MEC (J.E. Fernández) |

| | |
|---|---|
| Madrid Díaz, Fernando | Predoctoral (F. Cabrera) |
| Moreno Caro, David | Predoctoral (D. De la Rosa) |
| Palomo García, Mª José | Predoctoral J.A. (J.E. Fernández) |

# DPTO. 5: BIOLOGIA VEGETAL

| **Personal Funcionario** | **Categoría** |
|---|---|
| Troncoso de Arce, Antonio | Profesor de Investigación |
| Pintor Toro, José Antonio | Investigador Científico |
| Almoguera Antolínez, Concepción | Colaborador Científico |
| Jordano Fraga, Juan Bautista | Colaborador Científico |
| Leidi Montes, Eduardo Oscar | Colaborador Científico |
| Pardo Prieto, José Manuel | Colaborador Científico |
| Sarmiento Solís, Rafael | Colaborador Científico |
| Cantos Barragán, Manuel | Titulado Técnico Especializado |
| Liñán Benjumea, Juana | Titulado Técnico Especializado |
| García Fernández, José Luis | Ayudante de Investigación |
| Grande Crespo, Mª Carmen | Ayudante de Investigación |
| Parra Alejandre, Mª del Mar | Ayudante de Investigación |
| Villalón Martín, Mª Carmen | Ayudante de Investigación |
| Mendoza Baisas, Imelda | Auxiliar de Investigación |

| **Personal Laboral Contratado** | **Categoría** |
|---|---|
| Quintero Toscano, Francisco Javier | Inv. Cont. / I (J.M.Pardo) |
| Ramos Morales, Francisco | Inv. Cont. / I (J. A. Pintor) |
| Gutiérrez Ruiz, Mª Victoria | Ayte. Laboratorio (E.O. Leidi) |
| De Castro Pérez, Asunción | Ayte. T. Lab. / III (A. Troncoso) |

| **Personal Becario** | **Categoría** |
|---|---|
| Hernández López, Agustín | Postdoctoral (J.M. Pardo) |
| Luna Varo, Rosa María | Postdoctoral (J.A. Pintor) |
| Carranco Galán, Raul | Predoctoral (J.B. Jordano) |
| Dana Jiménez, Mercedes | Predoctoral CSIC (Pintor) |
| Barroso Ceballos, Sonia Inés | FPI MEC (J.A. Pintor) |
| Rodríguez Galán, José Manuel | FPI MEC (J.M. Pardo) |
| Rojas González, Ana Isabel | FPI MEC (J. B. Jordano) |

# ASISTENCIA TECNICA

| **Personal Funcionario** | **Categoría** |
|---|---|
| López Núñez, Rafael | Titulado Superior Especializado |
| García Aguilar, Mercedes | Ayudante de Investigación |
| Japón Navarro-Pingarrón, Humberto | Ayudante de Investigación |
| Suárez López, Mª Carmen | Ayudante de Investigación |
| Romero Marqués, Martín | Ayudante de Laboratorio |

# FINCA EXPERIMENTAL

| **Personal Funcionario** | **Categoría** |
|---|---|
| Fernández Ruiz, Manuel | Titulado Técnico Especializado |

| **Personal Laboral** | **Categoría** |
|---|---|
| Sánchez Peña, Fernando | Capataz |
| Antúnez García, José Antonio | Obrero Especialista Agrario |

| **Personal Laboral Contratado** | **Categoría** |
|---|---|
| Sánchez García, Fernando | Obr. Agr. no Esp. / IX (Int.) |

# GERENCIA

| **Personal Funcionario** | **Categoría** |
|---|---|
| Prieto Alcántara, Jesús | Titulado Técnico Especializado |

# ADMINISTRACION, BIBLIOTECA E INFORMATICA

| **Personal Funcionario** | **Categoría** |
|---|---|
| Parra Bernárdez, Carlos | Habilitado – Pagador |
| García Orgaz, Mª Mercedes | Ayudante de Investigación |
| Sabido Corro, Adela | Ayudante de Investigación |
| Moreno Sánchez, Francisco | Programador 2ª |
| Candau Lancha, Luisa | Auxiliar Administrativo |
| López Fernández, Mª Luz | Auxiliar Administrativo |

| **Personal Contratado** | **Categoría/ Nivel** |
|---|---|
| Morales Martínez, Pedro | Aux. Advo. / VI (J. Prieto) |

# SERVICIOS GENERALES

| **Personal Laboral** | **Categoría** |
|---|---|
| Roldán Pérez, Luis | Encargado de Almacén Central |
| García Pérez, Antonio | Encargado de Mantenimiento |
| Cordero Asencio, Serafín | Oficial Segunda de Oficio |
| Fernández Carrasco, Marina | Telefonista |
| Vidal Martín, Francisca | Ordenanza |
| Escobar Delgado, Carlos | Conserje |
| Rodríguez Montes, Vicenta | Limpiador Especializado |
| Sánchez García, Manuel | Oficial de Mantenimiento |

| **Personal Contratado** | **Categoría/ Nivel** |
|---|---|
| Prieto García, Elisa | Conserje / VII (Int.) |
| Fernández Sánchez, Aurora | Limp. Esp. / VIII (Int.) |

## *CONVENIO C.S.I.C. – I.N.E.M. Junio a Octubre 1.998*

**Titulado Superior (Opción Biología)**
Caballero Guerrero, Belén

**Titulado Superior (Opción Química)**
Cuenca Martín, Rosa Mª

**Programador**
Ruiz Redondo, Francisco Javier

**Operador de Ordenador**
Algaba Gil, Francisco Manuel

**Auxiliares Administrativos**
Carrión Bermúdez, Mª Dolores

Rodríguez Caro, Ana Rosa

**Ayudante de Laboratorio**
Cardo García, Mª Isabel
García-Cuervo Alvarez, Agustín
Gutiérrez Suárez, Eduardo
Tallón Arjona, Carlos M.

**Auxiliar de Laboratorio**
Guerle González, Francisco Javier
Hidalgo García, María
López Salvador, Ana Isabel
Rosado Escribano, Ana Mª

**Oficial de Mantenimiento**
Saura Maguillo, Severiano Manuel

## 7.2. Junta de Instituto

**Componentes**

**Presidente:** Dr. D. Juan Cornejo Suero
**Vicepresidente:** Dr. D. Francisco Cabrera Capitán
**Vicepresidente:** Dr. D. José Carlos del Río Andrade
**Secretario:** Ing. D. Jesús Prieto Alcántara
**Jefe de Departamento:** Dr. D. Luis Clemente Salas
**Jefe de Departamento:** Dr. D. Luis Madrid Sánchez del Villar
**Jefe de Departamento:** Dr. D. Felix Moreno Lucas
**Jefe de Departamento:** Dr. D. José Manuel Pardo Prieto
**Jefe de Departamento:** Dr. D. Cesáreo Sáiz Jiménez
**Repr. Personal:** Dra. Dª. Esmeralda Morillo González
**Repr. Personal**: D. Luis Roldán Pérez
**Repr. Personal**: D. Carlos Parra Bernárdez
**Repr. Personal**: D. Antonio Rosales Sánchez

# 7.3. Claustro Científico

**Componentes**

**Presidente:** Dr. D. Juan Cornejo Suero
**Secretario:** Dr. D. José Enrique Fernández Luque
**Vocales:**
Dr. D. Pablo Arambarri Cazalis
Dra. Dª. Concepción Almoguera Antolínez
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Dr. D. Antonio Troncoso de Arce

## 8.1 Presupuesto Ordinario (en miles de pesetas)

Reparación, mantenimiento y conservación de edificios..... 2.258
Reparación, mantenimiento y conservación de maquinaria..... 2.700
Material ordinario no iventariable..... 1.553
Suscripción a revistas..... 4.000
Energía eléctrica..... 9.500
Agua..... 255
Gas..... 15
Combustible..... 750
Vestuario..... 175
Finca experimental..... 1.000
Teléfono..... 1.206
Primas de seguros..... 154
Congresos y reuniones..... 231
Limpieza de edificios y jardines..... 2.502
Vigilancia y seguridad..... 6.778
Dietas..... 97
Locomoción..... 388
Infraestructura científica..... 13.000
Programación científica..... 10.131

## 8.2 Operaciones de Capital (en miles de pesetas)

Apoyo a las bibliotecas del CSIC..... 818

## 8.3 Operaciones Comerciales (en miles de pesetas)

Asistencia técnica..... 865
Productos de fincas y otros..... 1.128
Proyectos de investigación, convenios o contratos..... 7.246
Programación científica del CSIC..... 83.437
Programas financiados por la UE..... 59.548
Programa de apoyo a la infraestructura..... 37.932

## 8.4 Gastos de Personal (en miles de pesetas)

Contratos del personal..... 43.348

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