

SPANISH JOURNAL OF AGRICULTURAL RESEARCH

Formerly known as “Investigación Agraria” the SJAR merged in 2003 from two series: “Producción y Protección Vegetales” and “Producción y Sanidad Animales” founded in 1985, the predecessor of which was “Anales del Instituto Nacional de Investigaciones Agronómicas”, first published in 1952

EDITORIAL BOARD

Chief Scientific Editors

Cristina Chueca, Chief Scientific Editor (Plant Science). INIA, Madrid, Spain

Óscar González-Recio, Chief Scientific Editor (Animal Science). INIA, Madrid, Spain

Carmen De Blas, Chief Editor (Agricultural Economics, Engineering, Environment & Ecology). INIA, Madrid, Spain

Managing Editors

M. Victoria Baonza, INIA, Madrid, Spain

Carmen De Blas, INIA, Madrid, Spain

Technical Editor

Gema Pérez-Rivera, INIA, Madrid, Spain

Maria Luisa Cuéllar, INIA, Madrid, Spain. cuellar@inia.es

AGRICULTURAL ECONOMICS

SECTION EDITOR:

Jesús Barreiro, European Commission, Brussels, Belgium

ASSOCIATE EDITORS:

Félix Baquedano, Food and Agriculture Organization of the United Nations (FAO), Roma, Italy

Margarita Brugarolas, Univ. Miguel Hernández (UMH), Orihuela, Alicante, Spain

José A. Gómez-Limón, Univ. Córdoba (UCO), Spain

Maria L. Loureiro, Univ. Santiago de Compostela (USC), La Coruña, Spain

Laura Riesgo, Univ. Pablo de Olavide (UPO), Sevilla, Spain

Baldomero Segura, Univ. Politécnica de Valencia (UPV), Spain

AGRICULTURAL ENGINEERING

SECTION EDITOR:

José M. Peña-Barragán, Ins. Ciencias Agrarias (ICA-CSIC), Madrid, Spain

ASSOCIATE EDITORS:

Dionisio Andújar, Ins. Ciencias Agrarias (ICA-CSIC), Madrid, Spain

Dionysios Bochtis, Ins. Research and Technology Thessaly (IRETETH-CERTH), Thessaloniki, Greece

Ana I. de-Castro, Ins. Agricultura Sostenible (IAS-CSIC), Córdoba, Spain

Alexandre Escolá, Univ. Lleida (UdL), Spain

José V. García-Pérez, Univ. Politécnica de Valencia (UPV), Spain

Javier García-Ramos, Univ. Zaragoza (UNIZAR), Spain

Manuel F. Marey, Univ. Santiago de Compostela (USC), Lugo, Spain

Manuel Pérez-Ruiz, Univ. Sevilla (US), Spain

Antonio Rodríguez-Lizana, Univ. Sevilla (US), Spain

AGRICULTURAL ENVIRONMENT AND ECOLOGY

SECTION EDITOR:

Robert Savé, Investigación y Tecnología Agroalimentarias (IRTA), Caldes de Montbui, Barcelona, Spain

ASSOCIATE EDITORS:

Álvaro Alonso-Fernández, Univ. Alcalá (UAH), Madrid, Spain

Jorge Álvaro-Fuentes, Estación Experimental de Aula Dei (EEAD-CSIC), Zaragoza, Spain

Carmen Biel, Investigación y Tecnología Agroalimentarias (IRTA), Cabriels, Barcelona, Spain

Josep M. Espelta, Centre de Recerca Ecològica i Aplicacions Forestals (CREAF-UAB), Barcelona, Spain

Rosa Mosquera-Losada, Univ. Santiago de Compostela (USC), Lugo, Spain

Sebastián Sánchez-Fortún, Univ. Complutense de Madrid (UCM), Spain

Henrique M. Trindade, Univ. Trás-os-Montes e Alto Douro (UTAD), Vila Real, Portugal

ANIMAL BREEDING, GENETICS AND REPRODUCTION

SECTION EDITOR:

Luis Varona, Univ. Zaragoza (UNIZAR), Spain

ASSOCIATE EDITORS:

Isabel Cervantes, Univ. Complutense de Madrid (UCM), Spain

José M. Folch, Centre de Recerca Agrigenòmica (CRAG-UAB), Barcelona, Spain

Eva Mocé, Ins. Valenciano de Investigaciones Agrarias (IVIA), Valencia, Spain

Julián Santiago-Moreno, INIA, Madrid, Spain

ANIMAL HEALTH AND WELFARE

SECTION EDITOR:

Ramón A. Juste, Servicio Regional de Investigación y Desarrollo Agroalimentario (SERIDA), Villaviciosa, Asturias, Spain

ASSOCIATE EDITORS:

Eduardo Berriatua, Univ. Murcia (UM), Spain

Inma Estévez, Servicio Regional de Investigación y Desarrollo Agroalimentario (SERIDA), Villaviciosa, Asturias, Spain

Raul C. Mainar, Univ. Zaragoza (UNIZAR), Spain

Colin J. McInnes, Moredun Research Institute, Scotland, UK

ANIMAL PRODUCTION

SECTION EDITOR:

Francisco Pérez-Hernández, Univ. Autónoma de Barcelona (UAB), Spain

ASSOCIATE EDITORS:

Mar Campo-Arribas, Univ. Zaragoza (UNIZAR), Spain

Fuensanta Hernández-Ruipérez, Univ. Murcia (UM), Spain

Gonzalo Hervás, Ins. Ganadería de Montaña (IGMCSIC-ULE), León, Spain

Angeles Latorre, Univ. Zaragoza (UNIZAR), Spain

David Menoyo, Univ. Politécnica de Madrid (UPM), Spain

Rosa M. Nieto, Estación Experimental del Zaidín (EEZ-CSIC), Granada, Spain

Ana I. Rey, Univ. Complutense de Madrid (UCM), Spain

David Yáñez-Ruiz, Estación Experimental del Zaidín (EEZ), Granada, Spain

PLANT BREEDING, GENETIC AND GENETIC RESOURCES

SECTION EDITOR:

Ernesto Igartua, Estación Experimental de Aula Dei (EEAD-CSIC), Zaragoza, Spain

ASSOCIATE EDITORS:

Elena Cartea, Misión Biológica de Galicia (MBGCSIC), Pontevedra, Spain

Ana M^a Casas, Estación Experimental de Aula Dei (EEAD-CSIC), Zaragoza, Spain

Nicolás Jouve, Univ. Alcalá (UAH), Madrid, Spain

Antonio J. Monforte, Ins. Biología Molecular y Celular de Plantas (IBMCP-CSIC-UPV), Valencia, Spain

Elena Prats, Ins. Agricultura Sostenible (IAS-CSIC), Córdoba, Spain

David Ruiz-González, Centro de Edafología y Biología Aplicada del Segura (CEBAS-CSIC), Murcia, Spain

Isabel Vales, Washington State University (WSU), USA

Carlota Vaz-Patto, Ins. Tecnología Química e Biológica (ITQB-UNL), Oeiras, Portugal

Santiago Vilanova, Centro de Conservación y Mejora de la Agrodiversidad Valenciana (COMAV-UPV), Valencia, Spain

Dolores Villegas, Investigación y Tecnología Agroalimentarias (IRTA), Lleida, Spain

PLANT PHYSIOLOGY

SECTION EDITOR:

Aurelio Gómez-Cadenas, Univ. Jaume I (UJI), Castellón de la Plana, Spain

ASSOCIATE EDITORS:

José A. Casaretto, Univ. Guelph, Canada

Luis F. García del Moral, Univ. Granada (UGR), Spain

M. Cecilia Rousseaux, Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), Anillaco, La Rioja, Argentina

PLANT PRODUCTION

SECTION EDITOR:

Gustavo Slafer, ICREA/AGROTECNIO/UdL, Lleida, Spain

ASSOCIATE EDITORS:

Gabriela Abeledo, Univ. Buenos Aires (UBA), Argentina

Rossella Albrizio, Ins. Agricultural and Forest Systems in the Mediterranean (ISAFOM), Ercolano, Italy

Tony Fischer, Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia

Iñaki Hormaza, Ins. Hortofruticultura Subtropical y Mediterránea "La Mayora" (IHSM-CSIC), Málaga, Spain

Eric Justes, French National Institute for Agricultural Research (INRA), France

Youssef Roupheal, Univ. Naples Federico II, Portici, Italy

Heidi Webber, Univ. Bonn, Germany

Mark E. Westgate, Iowa State Univ., USA

PLANT PROTECTION

SECTION EDITOR:

Blanca B. Landa, Ins. Agricultura Sostenible (IASCSIC), Córdoba, Spain

ASSOCIATE EDITORS:

Leonardo De La Fuente, Auburn Univ., USA

Aurora Fraile, Univ. Politécnica de Madrid (UPM), Spain

Juan Imperial, Centro de Biotecnología y Genómica de Plantas (UPM-INIA), Madrid, Spain

Inmaculada Larena, INIA, Madrid, Spain

Donato Loddio, Istituto di Biologia Agroambientale e Forestale (IBAF), Legnaro, Italy

Vicente Marco-Mancebón, Univ. Rioja (UNIRIOJA), Logroño, Spain

Juan A. Navas-Cortés, Ins. Agricultura Sostenible (IAS-CSIC), Córdoba, Spain

Enrique Quesada, Univ. Córdoba (UCO), Spain

Jordi Recasens, Associate Editor. Univ. Lleida (UdL), Spain

SOIL SCIENCE

SECTION EDITOR:

José Torrent, Univ. Córdoba (UCO), Spain

ASSOCIATE EDITORS:

Fernando Gil-Sotres, Univ. Santiago de Compostela (USC), La Coruña, Spain

Juan V. Giráldez, Univ. Córdoba (UCO), Spain

Chiquinquirá Hontoria, Univ. Politécnica de Madrid (UPM), Spain

Angeles Prieto-Fernández, Ins. Investigaciones Agrobiológicas de Galicia (IIAG-CSIC), Santiago de Compostela, La Coruña, Spain

Tomás Undabeytia, Ins. Recursos Naturales y Agrobiología de Sevilla (IRNAS-CSIC), Spain

Tom Vanwallegem, Univ. Córdoba (UCO), Spain

WATER MANAGEMENT

SECTION EDITOR:

Luis Juana-Sirgado, Univ. Politécnica de Madrid (UPM), Spain

ASSOCIATE EDITORS:

Alfonso Domínguez, Univ. Castilla-La Mancha (UCLM), Ciudad Real, Spain

Gregorio Egea, Univ. Sevilla (US), Spain

Daniel Isidoro, Univ. Zaragoza (UNIZAR), Spain

José-Francisco Maestre, Univ. Politécnica de Cartagena (UPCT), Murcia, Spain

Luciano Mateos, Ins. Agricultura Sostenible (IAS-CSIC), Córdoba, Spain

Juan Reca, Univ. Almería (UAL), Spain