

# **CURRICULUM VITAE**

**M. Inés Mínguez-Tudela**

### **Current appointment:**

Director of CEIGRAM (Research Centre for the Management of agricultural and Environmental Risk)  
Full Professor of Crop Ecology and Agronomy  
(Catedrática de Universidad)  
Dept. Producción Agraria  
Escuela Técnica Superior de Ingeniería Agronómica, Alimentaria y de Biosistemas (ETSIAAB)  
Universidad Politécnica de Madrid (UPM)  
Ciudad Universitaria  
28040 Madrid, SPAIN  
Nationality: Spanish

### **II. EDUCATION**

Ingeniera Agrónomo UPM, 1978.  
Doctora Ingeniera Agrónoma, UPM, 1982  
Languages: fluent in French (French Baccalauréat- Bac. C) and English

### **III. RESEARCH AREAS AND PROJECTS**

**Research fields:** agronomy, crop ecology, cropping systems in semi-arid environments, crop simulation modelling; global warming, climate change in agriculture: uncertainty and vulnerability analysis; Yield Gap Analysis.

#### **Director of research in the following projects**

- 1- "Investigación en los sistemas agrícolas de secano de la Meseta Central: utilización de modelos de simulación y del análisis de componentes espectrales". (Crop modelling and remote sensing analysis)  
CICYT: AGF95-0115 Duration: 1995-1997
- 2- "ECLIMAR: Escenarios de cambio climático generados por un modelo regional de clima : Impacto sobre la productividad agrícola y las necesidades de riego en agrosistemas de la Península Ibérica". (climate change impact studies)  
CICYT: CLI95-1818-CO2. Duration: 1996-1998
- 3- "Impacto en el consumo de agua de los regadíos españoles asociado al cambio climático previsible" (General circulation Models in climate change assessments on water use in Spain, I)  
CEDEX: Ministry of Infrastructures: P97-0260-329. Duration: 1997-98
- 4- "Aplicación de los modelos regionales de clima a la predicción de los posibles efectos del cambio climático en las dotaciones de riego" (Application of Regional Climate Models to impact assessment on irrigation requirements in Spain, II)  
CEDEX: P97-0260-329B. Duration: 1998-99.
- 5- "Modelización y visualización 3-D de cultivos con un sistema-L paramétrico" (L-system based crop models)  
Project financed by CICYT: PB97-0569  
Duration: 1998-2001
- 6- "Generación de escenarios regionales de clima futuro y su aplicación para estudios de impacto en la Península Ibérica" (Assessment of climate change impacts, methodology)  
Project financed by CICYT: REN2000-0769-CO2-02 / CLI  
Duration: 2001-2003
- 7- "Prediction of Regional scenarios and uncertainties for defining European Climate change risks and effects" PRUDENCE, EVK2-CT-2001-00132  
Spanish Group Director  
Project financed by the European Union, V Framework Program  
Duration: 2002-2004.
- 8- "MINUNIMAD-CC: Minimising uncertainties in the analyses of climate change impact and adaptation in the agricultural systems of the Iberian Peninsula. Tool for Scientific Support to Policies.  
Project financed by CICYT: AGL2008-00385.  
Duration: January 2009-April 2012.
9. MACSUR Modelling European Agriculture with Climate Change for Food Security. ACS Project financed by the European Union, 7 Framework Programme.  
Duration: 2012-2013.
10. "MULCLIVAR" Multiscale Climate Variability. Agricultural and Economic Impacts.  
Project financed by CICYT: CGL2012-38923-CO2-02.  
Duration: 2013- June 2016

#### **Member of the research team in the following projects:**

- 1- "Unidad de Evaluación y Producción de Inoculantes". (Subproyecto: Agronomía de Leguminosas).  
Grupo de Investigación del Plan Andaluz de Investigación  
Coordinator of Research: R. Orive Echevarrieta. Depto de Suelos y Riegos. Centro de Investigación y Desarrollo, "Las Torres-Tomejil". Sevilla.  
Duration: 1989-1990.
2. "Productividad y Morfología del Desarrollo de Especies Oleaginosas de Brassica" Financed by Fundación Juan March.  
Cátedra de Fitotecnia I, ETSIA, Universidad de Córdoba and Depto de Cultivos Oleaginosos, INIA/CRIDA, Córdoba.  
Director of Research: E. Fereres.  
Duration: 1981-1982.
3. "El Laboreo Mínimo y el No Cultivo como Alternativas al Laboreo Tradicional": Project financed by CAICYT. (Ref. 474)  
Depto de Suelos y Riegos, INIA, Universidad de Córdoba and Cátedra de Fitotecnia I, ETSIA, Universidad de Córdoba.  
Director of Research: E. Fereres.  
Duration: 1982.
4. "Nitrogen Fixation in Forage Legumes"  
Department of Plant and Crop Physiology, Grassland Research Institute.  
  
Project financed by the Agriculture and Food Research Council.  
Director of Research: F. Minchin.  
Duration: October 1982 - October 1983 and July-August 1985.
5. "Caracterización ecofisiológica de los sistemas de conducción y poda, evaluación de sus posibilidades de mecanización".  
Project financed by Comunidad de Madrid, C025/90  
Director of Research: V. Sotés Ruiz.  
Duration: 1990-1991-1992.
6. "Generación de escenarios probabilísticos de impacto y adaptación al cambio climático en la agricultura de la zona Centro de la Península. Herramienta de Soporte Científico a la toma de decisiones, v. 2" PEII10-0248-5680  
Entidad financiadora: Vice-Consejería de Educación y Ciencia de Castilla-La Mancha  
Duration: April 2010-April 2013  
Director of Research: Margarita Ruiz Ramos.
7. MACSUR 1 and MACSUR 2: Modelling European Agriculture with Climate Change for Food Security.  
ACS Project financed by the European Union, 7 Framework Programme  
Director of Research: M. Ruiz-Ramos  
Duration: 2012-2014 and 2015-2016

#### **IV. POSITIONS IN EU AND NATIONAL ADMINISTRATIONS**

- Associate-Dean for Research and PhD Studies (1999-May 2004) ETSIA-UPM.
- Seconded National Expert at DG-RTD in the European Commission during 2005 (October) to 2007 (October) in the Directorate of International Cooperation is the origin of this collaboration. The involvement in the structuring of Framework Programme 7 (FP7) as well as interaction with other DGs with research funding has provided experience and contacts.
- Participation in the ERANET (FP6) EULANEST: "European – Latin American Network for Science and Technology. Participación en el grupo de coordinación (MICINN) - July 2006-June 2010- and the INCONET EULARINET (FP7): "European Union - Latin American Research and Innovation NETworks" - March 2008-February 2011.
- Member of the "Steering Committee for Human Resources and Mobility" (SG-HRM) or Meetings of Open Method of Coordination (OMC) on International Cooperation (2008-2010).
- Advisor to the Ministry of Science and Innovation for International Programmes and EU Programmes, 2008-2011, Spain
- Spanish representative in the "Standing Committee on Agricultural Research" (SCAR) since April 2009 until December 2011. Representing Spain.
- Deputy Vice-Rector for Research at UPM since May 2008 until December 2012

- Member of the Governing Board of the Joint Programme Initiative for Agriculture, Food Security and Climate Change (FACCE-JPI) since April 2015.

## V. EXPERT APPOINTMENTS

- Member of the Panel of Experts for EU Energy Facility, DG-DEVCO, and Manager of INCO projects in Dg-Research, European Commission, 2005-2007.

- Member of the Editorial Board of Australian Journal of Agricultural Sciences, CSIRO publishing, Australia (2005-2009)

- Member of Scientific Committee for 10th ESA Congress European Society for Agronomy, 2008

- Member of the Editorial Board of the Spanish Journal of Agriculture, INIA, Spain (2000-2004 and from 2014)

## VI. PUBLICATIONS

- Witty, J.F., Minchin, F.R., Sheehy, J.E. and Mínguez, M.I. 1984. Acetylene-induced changes in the oxygen diffusion resistance and nitrogenase activities of legume root nodules. *Annals of Botany* 53, 13-20.

- Minchin, F.R., Sheehy, J.E., Mínguez, M.I. and Witty, J.F. 1985. Characterization of the resistance to oxygen diffusion in legume nodules. *Annals of Botany*, 55, 53-60.

- Mínguez, M.I. and Sau, F. 1989. Responses of nitrate-fed and nitrogen-fixing soybeans to progressive water stress. *Journal of Experimental Botany*, 40, 497-502.

- Sau, F. & Mínguez, M.I. 1990. Response to water stress and recovery of nitrate-fed and nitrogen-fixing faba bean.

*Journal of Experimental Botany*, 41, 1207-1211.

- Mínguez, M.I., Ruiz Nogueira, B. and Sau, F. 1993. Faba bean productivity and optimum canopy management under a Mediterranean climate. *Field Crops Research*, 33, 435-447.

- Ridao, E., Oliveira, C.F., Conde, J.R. and Mínguez, M.I. 1996. Radiation interception and use, and spectral reflectance of contrasting canopies of autumn sown faba beans and semi-leafless peas. *Agriculture and Forest Meteorology*, 79, 183-203.

-Díaz-Ambrona, C. H.; Tarquis, A. and Mínguez, M.I., 1998. Faba bean canopy modelling with a parametric open L-system: a comparison with the Monsi and Saeki model. *Field Crop Research*, 58, 1-13.

- Ridao, E., Conde, J.R. and Mínguez, M.I. 1998. Estimating fAPAR from nine vegetation indices for irrigated nonirrigated faba bean and semi-leafless pea canopies. *Remote Sensing of Environment*. 66, 87-100.

- Sau, F. and Mínguez, M.I. 2000. Adaptation of indeterminate faba beans to weather and management under a Mediterranean climate. *Field Crops Research*, 66: 81-99.

- Guereña, A., Ruiz-Ramos, M., Díaz-Ambrona, C.H., Conde, J.R. and Mínguez, M.I. 2001. Assessment of climate change and agriculture across geographical areas in Spain using a General and a Regional Climate Model. *Agronomy Journal*, 93: 237-249.

- Díaz-Ambrona, C.H. and Mínguez, M.I. 2001. Cereal-legume rotations in a Mediterranean environment: Biomass and Yield Production. *Field Crops Research*, 70: 139-151.

- Boote, J., Mínguez, M.I. and Sau, F. 2002. Adapting the CROPGRO-legume model to simulate growth of faba bean. *Agronomy Journal*, 94, 743-756.

- Sau, F., Boote, K. J., McNair Bostick, W., Jones, J.W., and Mínguez, M. I. 2004. Testing and improving evapotranspiration and soil water balance of the DSSAT crop models. *Agronomy Journal* 96: 1243-1257

- Mínguez, M.I., Ruiz-Ramos, M., Díaz-Ambrona, C.H. and Quemada, M. 2004. Productivity in agricultural systems under climate change scenarios. *Journal de Physique, IV France*, 121, 269-281.

- Ruiz-Ramos, M. and Mínguez, M.I. 2006. ALAMEDA, A structural-functional model for faba-bean crops: morphological parameterisation and verification. *Annals of Botany*, 97, 377-388.

- Connor, D.J. and Mínguez, M.I. 2006. Looking at Biofuels and Bioenergy. Letter in Science 23 June 2006 on Biofuels. Vol 312 p 1743; [www.sciencemag.org](http://www.sciencemag.org)

- Olesen, J. E., Carter T. R., Díaz-Ambrona, C. H., Fronzek, S., Heidmann, T., Hickler, T., Holt, T., Mínguez, M. I., Morales, P., Palutikof, J. P., Quemada, M., Ruiz-Ramos, M., Rubæk, G.H., Sau, F., Smith, B. and Sykes, M. T. 2007. Uncertainties in projected impacts of climate change on European agriculture and terrestrial ecosystems based on scenarios from regional climate models. *Climatic Change* 81:123-143.

- Connor, D.J. and Mínguez, M.I. 2006. Looking at Biofuels and Bioenergy. Letter in Science 23 June 2006 on Biofuels. Vol 312 p 1743.

- Mínguez, M.I., Ruiz-Ramos, M., Díaz-Ambrona, C. H., Quemada M. and Sau, F. 2007. First-order impacts on winter and summer crops assessed with various high-resolution climate models in the Iberian Peninsula. *Climatic Change* 81: 343-355.

- Ruiz-Ramos, M. and Mínguez, M.I. 2010. Evaluating uncertainty in climate change impacts on crop

- productivity in the Iberian Peninsula. *Climate Research* 44: 69–82.
- Rey D., Garrido A., Mínguez M.I. and Ruiz-Ramos M. 2011. Impact of climate change on maize's water needs, yields and profitability under various water prices in Spain. *Spanish Journal of Agricultural Research*, 9: 1047-1058. doi: 10.5424/sjar/20110904-026-11.
  - Ruiz-Ramos M., Sánchez E., Gallardo C. and Mínguez M.I. 2011. Impacts of projected maximum temperature extremes for C21 by an ensemble of regional climate models on cereal cropping systems in the Iberian Peninsula. *Natural Hazards and Earth System Sciences Vol 11*: 3275–3291. doi:10.5194/nhess-11-3275-2011.
  - Garrido A., Rey D., Ruiz-Ramos M. and Mínguez M.I. 2011. Climate change and crop adaptation in Spain: consistency of regional climate models. *Climate Research* 49: 211-227.
  - Connor, D.J. and Mínguez, M.I. 2012. Evolution not revolution of farming systems will best feed and green the world. *Global Food Security*. 1: 106-113. <http://dx.doi.org/10.1016/j.gfs.2012.10.004>
  - Castañeda-Vera, A., Barrios, L., Garrido, A., Mínguez, M.I. 2014. Assessment of insurance coverage and claims in rainfall related risks in processing tomato in W Spain. *European J. of Agronomy*, 59: 39–48.
  - Gabaldón-Leal C., Lorite I.J., Mínguez M.I., Lizaso J.I., Dosio A., Sanchez E., and Ruiz-Ramos M., 2015. Local adaptation strategies for maize in Andalusia to cope with climate change and extreme temperature events in the 21st Century. *Climate Research* 65: 159–173.
  - Pirttioja, N et al. 2015. Temperature and precipitation effects on wheat yield across a European transect: a crop model ensemble analysis using impact response surfaces. *Climate Research*, 65: 87–105.
  - Castañeda-Vera, A., Leffelaar, P.A., Álvaro-Fuentes, J., Cantero-Martínez, C., Mínguez, M.I. 2015. Selecting crop models for decision making in wheat insurance. *European J. of Agronomy*, 68: 97–116

#### **Book chapters:**

- Iglesias, A. and Mínguez, M.I. 1995. Perspectives for maize production in Spain under climate change. En: *CLIMATE CHANGE AND AGRICULTURE: ANALYSIS OF POTENTIAL INTERNATIONAL IMPACTS*. Rosenzweig, C., Allen Jr., L.H., Harper, L.A., Hollinger, S.E. y Jones, J.W. . (Eds). Special Publication nº 59.Ch. 13, pp 259-273. American Society of Agronomy. Madison, Wisconsin.
- Mínguez, M.I. and Iglesias, A. 1996. Perspectives of future crop water requirements in Spain: the case of maize as a reference crop. En: *DIACHRONIC CLIMATIC CHANGES IMPACTS ON WATER RESOURCES WITH EMPHASIS ON MEDITERRANEAN REGION*. Angelakis, A. & Issar, A.S.(eds) pp301-317. NATO- Advanced Research Workshops Series. Subseries I: Global Environmental Change. Springer-Verlag, New York.
- Haverkort, A.J., van Keulen, H. and Mínguez, M.I., 1997. The efficient use of solar radiation water and nitrogen in arable farming: matching supply and demand of genotypes. En: *PERSPECTIVES FOR AGRONOMY-ADOPTING ECOLOGICAL PRINCIPLES AND MANAGING RESOURCE USE*. Eds. M.K. van Ittersum & S. van de Geijn. Ch. 18, Vol. 25. Developments in Crop Science Series. Elsevier Scientific.
- Sau, F. y Mínguez, M.I. 2005. Irrigation scheduling services in Spain: objectives and methods. En: *Irrigation and pest and disease models: evaluation in different environments and WEB-based applications* (Eds. G. Maracchi, L. Kajfez Bogataj, S. Orlandini, F. Rossi and M. Barazutti). COST ACTION 718 – Meteorological Applications for Agriculture. pp. 9-14. EU Publications.
- Mínguez, M.I., Ruiz Mantecón, A. y Estrada-Peña, A. 2005. Impactos sobre el sector agrario. En: Moreno J.M. (ed.) 2005. *Evaluación Preliminar de los Impactos en España por Efecto del Cambio Climático*. Ministerio de Medio Ambiente, Madrid, ES, pp 438-467.
- Contribuyentes citados: C.H. Díaz-Ambrona, M.P. Lavín, M. Quemadas, M. Ruiz-Ramos, F. Sau Sau.
- Ruiz-Ramos, M. and Mínguez, M.I. 2007. Functional-structural modelling of faba bean. In: *Functional-Structural Plant Models*. Vos J., Marcelis, L.F.M., de Visser, P.H.B., Struik, P.C. and J.B. Evers (eds), Wageningen UR Frontis Series Vol 38,187-197, Springer, The Netherlands.
- Garrido A., Bielza M., Rey D., Mínguez M.I. and Ruiz-Ramos M. 2011. Insurance as an adaptation to climate variability in agriculture. Chapter 19 in: Dinar A. and Mendelson R. (Eds) *Handbook on Climate Change and Agriculture*, pp 420-445. Edward Elgar Cheltenham, UK, Northampton, MA USA.

#### **Translation to Spanish:**

“Crop Ecology. Productivity and Management in Agricultural Systems”. Loomis R.S. and Connor D.J. (1996). Cambridge University Press. 538 pp  
 Ecología de Cultivos. Productividad y Manejo en Sistemas Agrarios 2002, Editorial Mundi Prensa  
 translated by Conde J.R., Mínguez, M.I. y Cantero, C. Coordinated and edited by Mínguez M.I.

#### **VII. PATENTS AND REGISTERED MODELS**

- Within the Decision Support System for Agrotechnology Transfer (DSSAT) the crop simulation model for fababean was generated by Boote, Mínguez and Sau.
- ALAMEDA v.3 ·D Model for the simulation of a legume crop. Ruiz-Ramos, M. Mínguez, M.I.  
 Type: Lindenmayer system's model  
 Registration number: M-002925/2004  
 Owner: Universidad Politécnica de Madrid, Spain

## **VIII. TEACHING AND RESEARCH APPOINTMENTS**

- Lecturer in Agronomy, ETSIA, Universidad de Córdoba. November 1980- April 1991.
- Visiting Research Worker, The Grassland Research Institute, Berkshire, UK, October 1982- September 1983, and July-August 1985.
- Lecturer (Profesor Titular) in Agronomy, ETSIA, UPM. April 1991- October 1991
- Full Professor of Agronomy, ETSIA, UPM. October 1991 - Present
- Visiting Professor, Joint Centre for Crop Innovation, The University of Melbourne, Australia June 2004 to May 2005

## **IX. OTHER ACTIVITIES**

- 1- Ph.D. dissertations supervised: 7
- 2- Coordinator of the PhD programme on: "Producción, Protección y Manejo Sostenible de Sistemas Agrarios" of the Universidad Politécnica de Madrid, 1992-2000.
- 3- Research Impact (excluding self-citations)  
Sources: Science Citation Index: over 350 citations.
- 5- Other recent Scientific Involvements:
  - Expert reviewer for the EC during 2004; 2010, 2013, 2015
  - Topic Coordinator (Water and Nutrient Limitations), IV Congress of the European Society for Agronomy, (ESA 96), Veldhoven-Wageningen, 1996)
  - Scientific Committee of the International Symposium on Modelling Cropping Systems, Division 2 of the European Society for Agronomy, Lérida 1999, Spain.
  - Member of the UPM Research Committee (2007-2012)
- 6- National Representative of the European Society for Agronomy in Spain from 1994 until October 2003.
- 7- Academic and Scientific Positions:
  - Member of the Academic Committee and the Staff Selection (1996-1998) and Appointment Committee (1996- May 2004). ETSIA-UPM.
  - Member of the Research Committee of the UPM, since 2007 till April 2008.