1. LIST OF PEOPLE WHO MAKE UP THE RESEARCH TEAM

The Geospatial and Precision Technologies for Sustainable Agriculture Group (tec4AGR0) has the qualification of research group by CSIC, and it belongs to Institute of Agricultural Sciences. Our scientific objectives are focused on three areas: 1) Development of tools for obtaining and processing spatial information on crops and their major pests, such as monitoring technologies, proximity sensors, remote sensors/drones, and management zones; 2) Application of new monitoring technologies and Decision Support Systems (DDS) to smart weed control; 3) Study of biotic (pests) and abiotic (water, nutrients) factors affecting their spatial and temporal impacts in Mediterranean crops using geospatial technologies in combination with environmental and agronomic data (crop development, site conditions, climate, soil) on diverse scales.

In recent years we have been assessing the agronomic, economic and environmental consequences of using different types of cropping systems in rainfed agriculture, focusing particularly on their effects on the vegetation dynamics, crop productivity and environmental footprint. We have developed tools (e.g., customized algorithms for remotely-sensed data and image analysis) for obtaining and processing spatial information on several herbaceous and woody crops and retrieving their main features related to crop production (e.g., 3D canopy architecture) and protection (e.g., weed infestations). The group has also recently open a new research line on water use efficiency and precision irrigation using both remote and on-ground sensing.

The current members of the Research Team are:

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
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<tbody>
<tr>
<td>José Manuel Peña Barragán</td>
<td>Tenured Scientist (IP of this project)</td>
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<tr>
<td>José Dorado Gómez</td>
<td>Tenured Scientist</td>
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<tr>
<td>Héctor Nieto Solana</td>
<td>Scientific Researcher (co-IP)</td>
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<td>Irene Borra Serrano</td>
<td>Post-doc “Juan de la Cierva” granted</td>
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<tr>
<td>Vicente Burchard Levine</td>
<td>Post-doc “Juan de la Cierva” granted</td>
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<tr>
<td>Benjamin Mari</td>
<td>Post-doc hired</td>
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<tr>
<td>Gustavo Adolfo Mesías Ruiz</td>
<td>PhD Fellow</td>
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<tr>
<td>Juan Diego Mena Castillo</td>
<td>PhD Fellow</td>
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<tr>
<td>Miguel Ángel Herrezuelo Bermúdez</td>
<td>PhD Fellow</td>
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<tr>
<td>David Campos López</td>
<td>Research assistant</td>
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<tr>
<td>José Manuel Martín Fernández</td>
<td>Research assistant</td>
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2. SCIENTIFIC-TECHNICAL ACHIEVEMENTS AND CONTRIBUTIONS TO SOCIETY

Activity of the Research Team (abbreviated, last 5 years):

- 4 Research contracts obtained as services to companies.
- 2 Innovation & Transference Projects
- 5 patent, software or methods developed and registered as intellectual properties in the past that are still active.
- Research projects: 4 International RTD, 5 National RTD program, 3 by CSIC (all under public competition).
- 82 articles in JCR journals.
- 1 books edited, 11 book chapters and 14 contributions in technical journals.
- 25 chapters in multi-authored volumes.
- 3 PhD thesis (+3 in progress) and 5 Master thesis (+3 in progress).
- 51 contributions to international and national congress.


3. **DOCTORAL TRAINING CAPACITY OF THE RESEARCH GROUP**

**PhD Thesis presented in the last 5 years**

Associated to the project “Desarrollo y validación de nuevas tecnologías de teledetección y aprendizaje automático aplicadas al control inteligente de malas hierbas”

  - **Student:** Juan Diego Mena Castillo  
  - **Supervisors:** J. Dorado and J. Borra  
  - **University:** Universidad Politécnica de Madrid

Associated to the project “New technological, agronomic and computer tools for weed management”

  - **Student:** Gustavo Adolfo Mesías Ruiz  
  - **Supervisors:** J. Dorado and J.M. Peña  
  - **University:** Universidad Politécnica de Madrid

Development of a monitoring system for forest health in the Autonomous Region of Madrid using remote sensing techniques.

  - **Student:** Pablo Jesús Torres Hernández  
  - **Supervisors:** M. García and H. Nieto  
  - **University:** Universidad de Alcalá

Evaluation and optimization of methodologies to estimate crop evapotranspiration in woody crops throughout remote sensing.

  - **Student:** Christian Cekalovic  
  - **Supervisors:** J. Bellvert and H. Nieto  
  - **University:** Universidad de Lleida

Desarrollo de nuevas herramientas tecnológicas y conceptuales para la implantación de sistemas de Gestión Integrada de Malas hierbas en viña.

  - **Student:** José García Guerra  
  - **Supervisors:** J. Dorado and F. Cabello  
  - **University:** Universidad Politécnica de Madrid

Monitoring Water Fluxes in Complex Landscapes: Improving remote sensing-based evapotranspiration models for tree-grass ecosystems.

  - **Student:** Vicente Felipe Burchard Levine  
  - **Supervisors:** M.P. Martín Isabel, H. Nieto and D. Riaño  
  - **University:** Universidad de Alcalá

Development and application of innovative remote sensing techniques for early-season monitoring of crop vigor and vegetative stress in Mediterranean agro-ecosystems

  - **Student:** Gaetano Messina  
  - **Supervisors:** G. Modica and J.M. Peña  
  - **University:** Università degli Studi Mediterranea di Reggio Calabria

The tec4AGRO group is integrated in the Doctorate Programs in Agro-environmental Technology for a Sustainable Agriculture (UPM, Madrid); in Agricultural Engineering, Food, Forestry, and Sustainable Rural Development (UCO, Cordoba); and in Remote Sensing, GIS and Cartography (UAH Alcalá de Henares). The group is active member of the Interdisciplinary Thematic Platform TELEDETECT, which integrates all CSIC research groups actively working on remote sensing. Therefore, the candidate will also benefit from the expertise and experience of TELEDETECT participants in diverse disciplines of interest.