

**IRTA**

**INSTITUT DE RECERCA I TECNOLOGIA AGROALIMENTÀRIES**

**OFFERS A PHD CANDIDATE CONTRACT**

**SPONSORED FELLOWSHIP – SCIENTIFIC INITIATIVES**

Among other duties (Act 4/2009), IRTA is responsible for organising scientific and technical training programmes within the scope of its strategy, alone or in collaboration with other entities and bodies, in particular with Catalan universities, professional agricultural organisations and sector groups or associations.

Given that within the framework of the research activities of the IRTA (Programme of Efficient Use of Water in Agriculture (IRTA Fruitcentre - Lleida)) there exists a specific budget provision, a decision have been taken to train researchers in the area of Plant Production.

As a result, it has been agreed:

1. To offer a PhD Candidate contract Sponsored Fellowship to participate in the project: “Advances in agricultural drought mitigation through evapotranspiration drought indices and weather forecast in a scenario of climate change”.
2. To approve the terms of employment attached as a schedule.
3. To manage this offer and to resolve any disputes which might arise, and administering the resources allocated.

Mrs. Montserrat Satorra  
Human Resources Manager - IRTA

## SCHEDULE

### CONDITIONS FOR THE OFFER OF A PHD CANDIDATE CONTRACT SPONSORED FELLOWSHIP – SCIENTIFIC INITIATIVES-, FOR THE AREA OF EFFICIENT USE OF WATER

Ref.: CPI1022

#### 1. Scope of application

Research into: Advances in agricultural drought mitigation through evapotranspiration drought indices and weather forecast in a scenario of climate change

In the coming decades, world food production will have to coexist with water's growing scarcity, extreme climatic events such as droughts, limited availability of arable land or unpredictable fixed costs, among others, while meeting the needs of a world population that is expected to increase around 70% by 2050. Drought, as an extreme climatic event with an increasing world-wide occurrence, plays an important role in agriculture, especially in the Mediterranean areas and has become an important topic for many management and policy decisions. Therefore, water management is a global challenge that must be addressed by society and even more so in the current context of climate change. In this scenario, the global challenge for agriculture of the XXI century will be based on how to mitigate extreme climatic events that will allow satisfying the expected food demand, with the foreseeable limitation of water resources. In the last decades, research in early drought detection and mapping has advanced using climate-based modelling data. However, existing climate-based drought indices may be inadequate for detecting the early onset and end of drought, as they do not entirely explain the real physiological state of vegetation, which is the most important variable that is required to understand the vulnerabilities of agrosystems to droughts. Moreover, water stress indicators based on remote sensing estimates of evapotranspiration (ET) showed superior capabilities for early drought assessment, although they still need to be refined for row crops. Thus, to increase the efficiency of early drought detection from an agricultural perspective and its assessment at regional scales, a time series analysis of drought indices including remote sensing of ET estimates are needed. Nonetheless, once a drought event is detected there is knowledge gap on how to mitigate its effects in agriculture. Currently, irrigation management is largely based on historical weather data. However, weather variability within an irrigation campaign implies a high margin of uncertainty when planning irrigation, especially when facing drought episodes. This, however, would be reduced if crop water needs could be applied based on a reasonably accurate long-range forecast of weather conditions (> 3 days).

**Goals and expected impact:** The main objective of this PhD will be to evaluate an early warning drought system focused on agriculture at regional scales based on ET drought indices as well as to assess crop's water demand based on long-range weather forecasts to mitigate its effects. Specific objectives are:

1. To evaluate different techniques to improve remote sensing ET estimates, especially for row crops.
2. To improve, evaluate and implement an early warning agricultural drought system through climate-based and remote sensing-based ET drought indices and its further intercomparison.
3. To anticipate crop irrigation water needs for drought event mitigation by assessing the inclusion of long-term accurate weather predictions.

Supervisor: Dr Jordi Cristóbal Rosselló.

Contact: For informal queries please contact Jordi Cristóbal at [Jordi.Cristobal@irta.cat](mailto:Jordi.Cristobal@irta.cat)

Place where the PhD candidate contract will be carried out: Fruitcentre (Lleida)

## 2. Requisites for applicants

The fellowship may be requested by candidates meeting the following requisites:

- 2.1.** Candidates must hold one of the following degrees: Environmental Sciences, Meteorology, Biology, Hydrology, Agronomic Sciences, Physical Geography (or related discipline)
- 2.2.** A Master's in Remote Sensing, Meteorology or Hydrology (or related)
- 2.3.** Not to have a PhD.
- 2.4.** Any prior experience in matters of computing (Python or similar), field work (demonstrable) or eddy-covariance data processing will be viewed positively.
- 2.5.** Candidates must provide a signed letter declaring their undertaking to register on a doctorate programme within the Catalan university system.
- 2.6.** Candidates who have been chosen for an interview with the Selection Committee, should bring –for the interview- a certified copy of the degree and/or master, as well as the academic record showing the marks of all subjects studied.
- 2.7.** Foreign candidates who have been chosen for an interview with the Selection Committee should bring –for the interview- a certified copy and certified translation of the degree and/or master obtained at a foreign university, as well as an academic record showing the marks of all subjects studied.

### 3. Duration

Notwithstanding the provisions of Point Nine of this offer, IRTA will subscribe with training research staff holding the Master's a temporary employment agreement linked to a specific service by virtue of which the researcher will be employed by the IRTA, with both parties assuming the contractual obligations arising therefrom and which, in any case, will be in line with the content of the application.

The duration of the PhD Candidate contract will be for one year, extendible by yearly periods, subject to the issuance by the doctoral candidate of the report corresponding (from the Candidate and from the Doctoral School) to the yearly period completed. Under no circumstances may the accumulated duration of the initial PhD Candidate contract plus the extensions exceed three (3) years.

### 4. Suspension of the PhD Candidate contract

The suspension of the PhD Candidate contract on the grounds established under articles 45 *et seq.* of the Workers' Statute will not imply any extension to the duration of the PhD Candidate contract except for situations of temporary incapacity, risk during pregnancy, maternity, adoption or fostering, risk while breastfeeding and paternity during the duration of the PhD Candidate contract, which will interrupt the calculation, pursuant to the provisions of Article 11.1.b) of the Consolidated Text of the Workers' Statute Act.

### 5. Financial remuneration<sup>(1)</sup>

The financial remuneration for the PhD Candidate contract will be €1,247.52/gross per month (€17,465.28/gross per annum) for the first and second years. For the third year, it will be €1,336.63/gross per month (€18,712.82/gross per annum) which will be subject to the corresponding withholdings, pursuant to prevailing regulations, and to the collective employment agreement of IRTA.

IRTA will also pay the annual fees of the doctoral school when receiving the enrolment.

### 6. Applications

Interested parties should be registered at the Employment Service's website of IRTA <http://www.irta.es/en/work-at-irta/> adding his/her *Curriculum vitae*

### 7. Application period

The period for submitting applications opens as of the date of the offer and ends on June 2<sup>nd</sup> 2022.

## 8. Assessment and selection

The selecting of candidates will be carried out by an *ad hoc* committee consisting of the Head of the Program and two researchers (level D or higher) appointed by him/her.

## 9. Acceptance of PhD Candidate contract and payment

When accepted, the applicant must sign a document undertaking to comply with all the conditions of the PhD Candidate contract established in these terms, and in particular, with the following:

**(a)** To join the centre within one month of notification and to have exclusive dedication to the training programme proposed, in accordance with the internal rules of the centre. Failure to join could be considered to be a waiver of the right to financial aid.

**(b)** To present to the tutor appointed by the IRTA and HR, each year, 30 days before the renewal date of the agreement, a report on the work carried out to date in accordance with the model to be provided by the HR Department.

**(c)** To send to the tutor appointed by the IRTA a copy of any publications, articles and studies which might arise from the training programme carried out and the results obtained.

**(d)** To refer, in any written production arising from the training programme carried out, to the present PhD Candidate grant.

The non-fulfilment of any of the conditions of these terms without justification may imply the revocation of the PhD Candidate contract.

## 10. Assessment and continuity of the PhD Candidate contract

Based on the report drawn up by the interested party (mentioned in Point 9 (b) of this offer), the tutor(s) must prepare therein a report based on the tasks performed by the doctoral candidate and recommend the continuity or revocation of the PhD Candidate contract for the forthcoming yearly period. In the event of a negative assessment, grounds must be given.

To proceed with the continuity of the contract it will be necessary as well to present a copy of the registration to a pertinent PhD course and the corresponding evaluation report from the Academic Committee of the PhD program or from the PhD School.

## **11. Intellectual property**

The IRTA is exclusive holder of the intellectual and industrial property rights which might arise as a result of the activity carried out by the candidate or technologist during the training programme, notwithstanding recognition of authorship when necessary.

The publicising of any information obtained by the candidate in the form of scientific or informative articles, presentations for meetings and conferences or any other means or format may be carried out where necessary at the initiative and with the consent of the director(s) assigned by the IRTA to each of them.

## **12. Incompatibilities**

This PhD Candidate contract will be incompatible with any other activity related to the research and training purpose of the same.

## **13. Waiver of the PhD Candidate contract**

In the event the beneficiary should waive their right to the PhD Candidate contract, they must provide IRTA with a report on the tasks performed up to the time of their experimental waiver, notwithstanding the prior notice established by legal regulations. All data obtained during the training programme will be returned to IRTA.

## **14. Confidentiality undertaking**

The beneficiary of this contract agrees to keep any data or information to which it might have access as a result of their relationship with IRTA strictly confidential, whatever the form of access to such data or information and the format in which they appear, it being totally prohibited to make copies without prior consent.

The access to and processing of data of a personal nature as a result of the relationship established with the IRTA will be carried out in accordance with the purposes established in the agreement, with the duty of secrecy continuing even after such relationship has concluded.

## **15. Data protection**

Any data provided by candidates will be recorded in a file of IRTA in order to manage the process.

Pursuant to the provisions of the Spanish Organic Law 15/1999, of 13 December, on the protection of data of a personal nature, any interested parties may exercise their rights to and rectification before the Human Resource Department of the IRTA.

<b>TIMING PHD CANDIDATE CONTRACT: (CPI1022)</b>	
<b>Deadline: <i>June 2nd 2022</i></b>	<b>Process</b>
30 days	Publication and diffusion of the job advertisement on IRTA's website, EURAXESS Jobs, social networks and other specific recruitment places.
2 following working days	To send, for its study, the pre-selected CV which match eligibility criteria to the Selection Committee. To send an automated e-mail for those who have not been pre-selected and cannot continue the process.
10-15 following working days	Selection Committee: .Interview with preselected candidates. .To send an e-mail for those who have not been selected by the Selection Committee. .Committee Selection Agreement with the selected candidate, giving reasons for the rest to be excluded. . Notification by e-mail to the candidates who have been interviewed but not selected.
12-16 following working days	To send to HR all the needed official documentation in order to make the work contract and co-ordination for establishing the start of the employment.
July	Start of employment.

(1) The financial remuneration of the PhD Candidate contract may not be less than 56% of the salary established for the category of Research Collaborator F of the Collective Agreement of the IRTA during the first two years, 60% in the third year and 75% in the fourth (Act 14/2011 of 1 June).