PhD position in Agronomy, Economics or Statistics

Modelling short term and long term decisions of farmers in water scarcity contexts through agronomic and economic coupling

We are inviting applications for a 3-year PhD position in Agronomy, Economics or Statistics at the mixed research unit AGIR (Agrosystems and agricultures, resources management, innovations & ruralities) in partnership with the mixed research unit LERNA (Laboratory of natural resources economics). The position will be opened mid-2013. Application should be sent before March 10th, 2013.

Description

The objective of the thesis is to develop a framework aiming at combining economic and agronomic modelling of farmer’s decisions into a unified framework. A first originality of the proposed work will be to jointly represent long-term and short term decisions of farmers into this unified framework. Short-term decisions (“tactical decisions”) such as use of fertilizers and irrigation scheduling will be piloted through an agronomic decision model whereas long-term decisions (“strategic decisions”) such as choice of investment will be optimized through an economic model taking into account farmer’s anticipations on markets (crop prices) and on production risks (climate). How to represent interactions between short-term and long-term decision-making process will be a key methodological issue to be investigated. The second originality of the proposed thesis will be to consider a context of water scarcity in which farmer water withdrawals either have an impact on the water supply cost or on the future availability of the water resource. Most of the modelling will be implemented at the farm-level however interactions across farmers through use of water viewed as a common pool resource will be explicitly considered.

The conceptual approach will be based first on previous works conducted by the AGIR and LERNA research teams on use of bio-decisional models for farming system design (Bergez et al., 2010). The second type of literature we will rely on is the one dealing with water use by farmers at various scales (Leenhardt et al., 2012). The empirical implementation of the modelling will be done in a watershed of South India (AICHA project, http://www.ambhas.com/) and/or in a small river catchment area in Southwest of France, which still need to be determined. The empirical implementation will rely on the RECORD platform (http://www4.inra.fr/record_eng/). RECORD (Bergez et al., 2012) is a platform for developing models of cropping systems, including crops, soils, pests, pathogens and farm managers, at different spatial and temporal scales.

The PhD student will be based at the UMR AGIR, in Toulouse. His/her work might include field works in India or in France. He/she will work under the supervision of J-E Bergez (UMR AGIR), but will have close interactions with the other researchers of the AICHA project (in particular A Thomas and A Reynaud, UMR LERNA). He/she will participate to plenary seminars of the AICHA project.

Candidate

The student must have a good training in modelling (agronomics and or economics). Good experience in econometrics or statistics is also appreciated. He/she must be familiar with some modelling languages such as R or Gams and have a good knowledge in systemic agronomy. Fluent English speaking and writing is required.

Contact:

Please send applications to: jbergez@toulouse.inra.fr
Applications should include a CV, a motivation letter, email of two referees and a document arguing the capacities of the candidate within the following domains: 1. agronomy, 2. economics, 3. statistical analyses, 4. modelling.

**Keywords**
Systemic modelling, Water management, Cropping system, Optimisation, Decision making, India

**References**

