

Approaches and methods to produce technical references and to support organic rice producers in Camargue

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Introduction

For several years now, rice growing in Camargue has been affected by relative instability due to a stagnation of yields, price fluctuation, an increase of production costs and to regulations limiting the use of cropping practices which impact the environment. In this context, organic rice production has progressively emerged as a possible alternative for a certain number of rice producers. Three major stages can be seen in the evolution dynamics of the development of this type of production. The first stage took place at the end of the 1970s. It happened at the same time as the launch of the recovery plan for French rice production, advocated by the representatives of rice production with the support of the Parc Naturel Régional de Camargue (Camargue regional natural park). The handful of rice growers who developed organic rice back then were the pioneers of this production method. Marginalized for about two decades, they are now recognized and stand as models of reference for part of the Camargue farming sector. In the mid-nineties, the economic downturn and the drop in the prices of conventional rice resulting from the 1994 GATT agreements account for the significant development of surfaces converted to organic farming (OF). This second stage translated into a significant increase in the number of rice producers who partially or fully converted their farm operations. Based on our observations, the third stage is currently in the making and translates into a new development of organic rice farming at the level of the Camargue territory. It relies on the one hand on the incentives and/or regulatory measures proposed by the Grenelle meetings on environment and on the other hand on directives being drafted on the new European agricultural policy. It was during the second stage that the INRA, in collaboration with the Centre Français du Riz (French Center for Rice) and the support of FranceAgriMer, initiated research actions focused on the operation of organic rice production systems. These research actions aim at giving concrete answers to questions raised by the farmers to help them achieve their targets while meeting production specifications and responding to the community's requirements.

Approaches, methods and research programs

The INRA does not have an experimental station dedicated to rice growing. Questions regarding the functioning of organic rice production systems were considered in the framework of a partnership-based research action approach. The research projects are conducted in situ on farms managed by farmers who are de facto partners of actions performed by the research team. This team also relies on professional organizations such as the French Center for Rice and it sets up ad hoc associations with other public (Inra, Cirad, Cemagref) and/or private (Station Biologique de la Tour du Valat / Tour du Valat organic station) research units. Training is also incorporated in each of the phases of the research action whose results subsequently feed the modules of the teaching curriculum. In retrospect, it is possible to define six phases making up the overall research approach implemented over the 2002/2012 decade:

- Phase1- Even if the research team was already deeply involved in the analysis of the functioning of conventional rice production systems, some learning proved necessary to efficiently identify issues implied by the operation of organic rice production systems. This

training was made possible by an agronomic pre-survey based on monitoring of the plots managed by those rice producers who had pioneered the conversion to OF.

- Phase 2- Surveys in organic rice farms, supported by a regional agronomic diagnosis and an analysis of the diversity of agricultural practices made it possible to draw a typology of farms and formalize questions raised by organic rice farmers as well as identify the obstacles, constraints and assets of this production method. This work was carried out in the framework of an interdisciplinary research action formalized in the “Cebioca” project (organic grain farming in Camargue. 2002-2005) [1]
- Phase 3 - Questions on weed control and the management of organic fertilization were researched based on factor-based experiments conducted with the rice producers on their plots.
- Phase 4 - From 2006 to 2008, the "ORPESA" project (Organic Rice Production in Environmentally Sensitive Areas) [2] aimed at setting up pilot groups in each of the rice growing areas of the European countries involved as partners of the project
- Each pilot group was then mobilized in the participative drafting of the specialized modules, learning and vocational training materials.
- Phase 5 - The question of economic opportunity and conservation of soil fertility permitted by a second subsequent cycle of rice cultivation was studied based on the prototyping of the technical method. [3]
- Phase 6 - Last, in relation to the context evolution as described in the 3rd phase of development of Camargue organic rice production (see introduction §), work was carried out on the co-construction and assessment of scenarii related to the development of organic rice production systems, based on models elaborated in partnership with the stakeholders of the territory for the execution of interactive simulations.[4]

In the course of this decade, the various phases of the approach relied on a program made up of a network of plots located in partly or totally organic rice farms. The program fits in the conceptualization of a network-based agro-ecology program proposed by K. Warner in 2007: "A program of voluntary work in a network over several years, between, at least, producers, a producers' organization and one or several farming consultants and researchers to develop agro-ecological knowledge and to protect natural resources using “on-farm” demonstrations at the level of the plot.” [5]

Results and discussion

The learning phase was a determining stage for the research team. It led to the discovery of new technical systems and innovative cropping practices used by farmers who had until then not been referenced at all or very little by development and research organizations. Involvement of the team in the field during that phase fostered the climate of trust necessary to enhance loyalty to the partnership and objectify the data collected in the course of successive surveys. The program's network structure, the base of all the research and training actions conducted during the decade, was achieved thanks to this loyalty and the climate of trust. Factorial experiments carried out on the cover crop management and organic fertilization produced references on the effects of crop rotation and of the fractioning of fertilization [6][7]. The prototyping of the technical method made it possible to test an original weed management technique through the introduction of ducks in the fields. This innovation raises many questions of research and development likely to foster new research actions. Lastly, the Cebioca and Orpesa projects as well as the 1st international conference organized in Montpellier in 2012 were great opportunities for multidisciplinary interactions and encounters between scientists and stakeholders of the sector.

In the evolution path of organic rice production in Camargue, one can now observe a stage of development of these production methods at territorial level. Some farmers have changed

their minds regarding organic rice production and are partly or totally converting their farms to OF. Moreover, outlets and markets are growing and consolidating for products from OF. Co-assessment with local stakeholders of the various scenarii on the development of OF in Camargue must involve helping them in their reflection on the implementation of action plans to make these changes sustainable. The contribution of these research actions to the development of organic rice production in Camargue proves that it is possible to continue approaches for partnership-based research /action and to support farmers and other stakeholders in the transformation of their farming systems toward a more sustainable agriculture.

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