Availability and use of information by farmers when making operational decisions

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Introduction

Within the actual context of climate change, environmental footprint awareness, shift of consumers demand and globalization of markets, farmers have to adapt their production and management practices. In the face of today's difficulties of public authorities and advisory profession in supporting farmers in their mutation (for instance, failure in France of the directive Ecophyto to achieve the objective of 50 % of pesticides reduction before 2018, or under-utilization of decisions-support tools), there is a need to analyze farmers days to days needs and drivers for actions. Better understanding of farmers' decision-making process regarding operational choices (*i.e.*, technical operations to perform on the farm) is thus necessary (Daydé et al., 2014). It can be a mean to identify needs and action-levers in order to build new and efficient tools to support farmers.

Information is a necessary component of each step of the decision-making process, from analysis of the situation to evaluation of alternatives and choice (Solano et al., 2003; Sorensen et al., 2010). Farmers can find this information in their environment (from advisory profession, internet, observation…) or derive it from their own knowledge (acquired through experiences). The current trend is towards increasing the amount of row data regarding agricultural practices (e.g., through experimentation, spreading of measurement devices…). Consequently, the amount of information that farmers can use to make operational decisions is growing impressively. But given human limited cognitive capacities, farmers have hard time to exploit this huge body of information in their decision-making process (Öhlmér et al., 1998; Daydé et al., 2014).

The issue of imbalance between the richness of available information and farmers' ability to harness it in their decision-making process has received little attention so far. In this study, a comprehensive approach based on interviews is adopted; it explores the origin (*i.e.*, internal knowledge or external sources) and the nature of information used by farmers in their process of making operational decisions.

Materials and Methods

The challenge of this study is to develop a survey approach: 1) to differentiate information derived from farmers' knowledge, information sought through external sources (from advisory profession, internet, observation…) and information actually used in the decision-making process, and 2) to explore the articulation between information source, information used in the decision-making process and operational choices (as the outcomes of the decision-making process). The survey is inspired from

different disciplines (*eg.*, cognitive psychology, experimental economy, agronomy…); to overcome the deficiencies that are inherent in one method of investigation, we combine methodologies in the study of the same phenomena (Denzin, 1970). The final survey is thus composed of a combination of experiences (*eg.*, role-playing game, situational exercises or lottery games), calendar-based positioning of management operations and questionnaires.

Our analysis focuses on information, decision-making and practices regarding fungal diseases control on soft wheat. It is based on the examination of surveys conducted on 32 farmers by the end of 2015 in southwest France.

Results and Discussion

The analysis is still in progress. However first results shows the high heterogeneity of knowledge among farmers; for instance, farmers' knowledge on the role of different factors on fungal diseases development is different. The quantity and the nature of information used in the decision-making process are also variable among farmers. Particularly, little of the factors classically mentioned for an integrated pest management are used by farmers when making decisions about the number of fungicides treatments, the types of products to be used and the associated doses. Knowing the reasons for this underuse (e.g., lack of knowledge, farmers' preferences…) could lead to interesting consequences regarding farmers' support policies. The goal now is to build typologies of farmers regarding their operational choices and to explore the role of knowledge, of external information availability and of information used in the process of decision-making relatively to the role of others parameters revealed in the survey (*e.g.*, preferences, risk aversion, characteristics of the production situation…).

Conclusions

This study is a first step toward the comprehension of farmers' appropriation and use of the increased amount of information in agricultural sector. Conclusions to be drawn concern the elaboration of different support strategies according to farmers' types revealed by the survey. Next stages are to extend our approach to real situation context and to integrate our results in a general model of farmers' decision-making process.

References

Daydé, C., Couture, S., Garcia, F., & Martin-Clouaire, R. : 2014 : Investigating operational decision making in agriculture. Proceedings of the 7th Int. Congress on Environnemental Modelling and Software.

Denzin, N. K. : 1973: The research act: A theoretical introduction to sociological methods. Transaction publishers.

Öhlmér, B., Olson, K., & Brehmer, B. : 1998: Understanding farmers' decision making processes and improving managerial assistance. Agricultural economics, 18(3), pp.273-290.

Solano, C., Leon, H., Perez, E., & Herrero, M. : 2003 : The role of personal information sources on the decision-making process of Costa Rican dairy farmers. Agricultural systems, 76(1) pp. 3-18.

Sorensen, C. G., Pesonen, L., Fountas, S., Suomi, P., Bochtis, D., Bildsøe, P., & Pedersen, S. M. (2010). A user-centric approach for information modelling in arable farming. Computers and Electronics in Agriculture, 73(1), 44-55.