A Sociological Approach to Determine the Advisers and Stakeholders Requirements for Nitrogen Management and Diagnosis Tools.

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Background and objectives

French agricultural research and technical institutes aim at providing a tool contributing to nitrogen losses evaluation and management improvement in various agricultural systems.

However, the experience showed that scientists did not always provide relevant tools, because they neglected the constraints and requirements of stakeholders and advisers in their job. Elsewhere, current decision support systems (DSS) are not updated enough after 2 decades of high improvement of scientific knowledge.

Objectives of the project:

⇨ to collect and analyse the requirements of people of the French community concerned by nitrogen in agriculture and in the environment,

⇨ in order to define the functional specifications of the tool we wanted to provide.

Strategy and methods

• 28 persons of the Environment and Agriculture areas (working in environmental agencies, in the fertiliser industry or trade, in agricultural extension services, in environmental associations, in Ministries of agriculture and of the environment, and their regional services), interviewed individually according to the sociological method designated as “the comprehensive interview” (Kaufmann, 1996), during 2 hours, based on an interview guide.

• Issues discussed gathered in 4 topics:
- the activity of the interviewed persons and its characteristics,
- the stakes related to N in their activity,
- the means used to assess N losses and their diagnosis,
- the use of tools dealing with environmental assessment (not especially N).

• Synthesis of each interview performed to draw the main conclusions of the interviews, and to build a typology clustering persons having the same expectations on N management and diagnosis DSS, using categorisation (Girard et al, 2001).

• Determining the target users, the main objectives and the functional specifications of the decision support system.

Results and discussion

General results of the interviews

➔ diversity of behaviours and solutions of the persons confronted with N losses evaluation and analysis, obviously related to their missions in their organisms.
➔ lack of tools usable by non scientists and having an actual scientific reliability, enabling the evaluation and management of N in evolving agricultural systems.

Typology of the interviewed persons and their requirements

➔ 5 profiles of potential users of our future DSS:

1. agricultural advisers: they need tools which are complementary to their recommendation tools for fertilisation, notably able to assess the economical and environmental risks related to fertilisation;
2. engineers involved in multi-criteria environmental evaluation: they work on (or with) tools considering numerous criteria (beyond N losses) but could be interested in modules enabling a more accurate evaluation of N losses;
3. stakeholders and advisors involved in water quality actions: they require simple tools enabling to test different agricultural management strategies and their environmental consequences, in order to know which ones they have to favour. Most of them work at regional or watershed scales;
4. stakeholders of environmental agencies and persons involved in fertiliser industry, who are increasingly concerned with gaseous losses: they expect a DSS integrating very recent scientific knowledge, in order to improve regulations and to evaluate their consequences;
5. teachers and professionals involved in training: they need a tool having educational properties but they do not search for a specific educational software, preferring working on DDS used by professionals.

Various and wide requirements observed in these interviews ⇨ need to select target users

➔ types 3 and 4, whose approaches concerning N were consistent to the main initial objectives of the project,

➔ type 1 requirements were also taken into account because these advisers are very active in the agricultural world.

Conclusions

To match the requirements of the target users ⇨ a DSS including a performing dynamic simulator based on N cycle modelling (Cannavo et al, 2007), coupled with climatic, soil and agricultural practices databases, favouring its use by non-specialists. The finale purpose is the building of a database including N losses results associated with data describing the agricultural systems and the pedo-climatic context.

References

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