Valerie

Valorising European Research for Innovation in Agriculture and Forestry

Contents

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Goals of VALERIE in brief

The VALERIE project started in 2014 with the following aims:

- Improve **access** for practitioners and advisers to existing **information for innovation** in agriculture and forestry, from European and national sources

- Build a **'virtual adviser'** tool (*ask-Valerie.eu*) to enable this access; and to support **communication** among practitioners and advisers

- Work with stakeholders in **case studies** to **guide the development** of the tool

- Deliver the **'virtual adviser'** tool for integration in the European Innovation Partnership (EIP) -AGRI Service Point platform to ensure its legacy

The case studies

Consulting stakeholders (advisers, farmers, processors, researchers, decision makers etc.) in case studies is a **key part of the project** particularly in terms of developing *ask-Valerie.eu*. In the process the project has provided the case studies with information on innovations and given them the opportunity to test selected innovations in trials.

Talking to stakeholders we have learned how they identify innovation needs (research needs and gaps), and how they seek, interpret, and integrate new information. Now we are asking them as potential users to test and provide feedback on *ask-Valerie.eu*.

- Catchment scale resource use efficiency, UK
- Soil management in livestock supply chains, UK
- Sustainable forest biomass: recycling of wood ash, Finland
- Agroecology: managing plant protection, France
- Innovative arable cropping, France
- Sustainable forest management and ecosystem services, Navarra and Basque Country, Spain
- Improving milling wheat quality, Italy
- Drip irrigation management in tomatoes and maize, Italy
- Sustainable onion supply chains, Netherlands
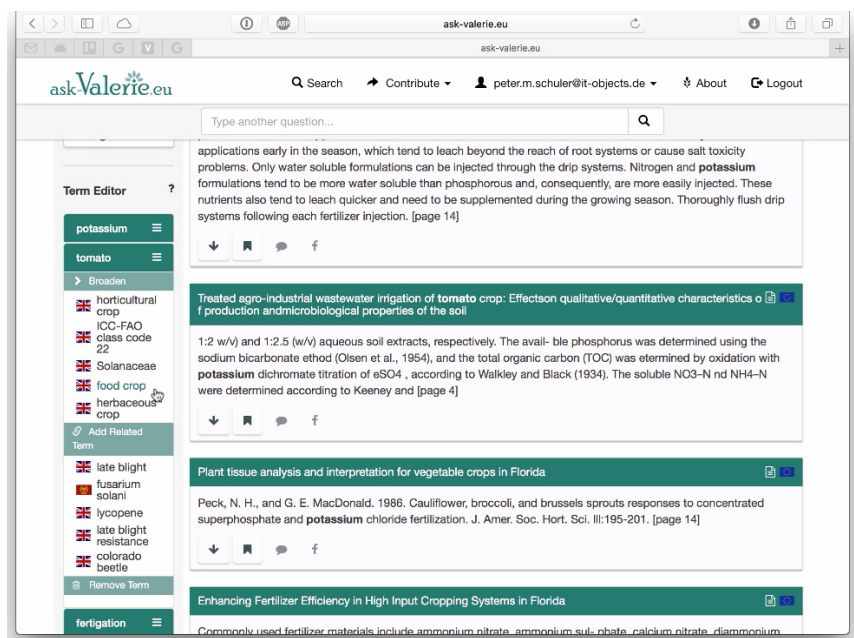- Sustainable potato supply chains, Netherlands/Poland

The 'virtual adviser' *ask-Valerie.eu*

We are developing a highly interactive tool called *ask-Valerie.eu*. The tool uses **web-semantics** technology and core to the approach is a 'built-for-purpose **vocabulary**' of key terms covering agriculture and forestry. The tool integrates this vocabulary with the following components: (1) a selected **document** base; (2) a dedicated **search** tool; (3) an interactive user-interface that helps **articulate** user queries and **present** top ranked documents; and (4) a communication platform enabling stakeholders to **exchange views**, locate advisers or suppliers, etc. We also aim to develop facilities enabling users to contribute documents, terms for the vocabulary, innovations, etc.

When using *ask-Valerie.eu* users can improve the relevance of their search results by filling out the **user profile** and **language preferences**: selecting their preferred language for interaction with *ask-Valerie.eu*, and for retrieving documents.

Other tool components include algorithms for automated annotation of documents (i.e. taking document indices or **digital fingerprints**, based on the vocabulary used); and for **ranking** and presenting documents, or **text fragments** thereof, that best-match the user query. A novel feature is the '**query editor**' that allows the user to verify which subset (terms in the query) was actually used to identify matching documents, and to tailor the query using this feedback along with the documents retrieved.

Feedback so far

Over the last two years we have **developed** and **tested** *ask-Valerie.eu* and collected suggestions for improvement from advisers and experts involved in the project (Oakham, January 2015; Helsinki, June 2015; Turin, January 2016; Amsterdam, June 2016). We have also sought feedback from representatives of farming, forestry and extension organisations at the European level, the SCAR (the EC Standing Committee on Agricultural Research), and other actors in the 'knowledge and innovation systems' at initial and mid-term meetings. We convened twice at the Copa-Cogeca offices in Brussels (June 2015; June 2016), to present the project with a focus on the *ask-Valerie.eu* tool and its intended use. Both meetings were well attended.

This feedback has helped us develop and improve the tool by highlighting the importance of **multiple languages**; of **separating scientific** information from practical guidelines (**fact sheets**, **manuals**); and of connecting to **existing national repositories** of practical documents. The workshops also confirmed the importance of linking to what's going on in the national regions; of connecting to *ask-Valerie.eu* from Rural Development Programme national pages; and of cross-border interaction among advisers.

Unique features of *ask-Valerie.eu*

With the unique features of the tool (above and below) and the stakeholder and expert input into its development, we believe *ask-Valerie.eu* has the potential to provide a more tailored, smarter and interactive tool than other search engines for agriculture and forestry. With a year of the project left, we are now asking stakeholders to test the prototype tool and help us realise this potential.

Multiple-languages

We have translated the vocabulary in a selected set of languages. Since late summer 2016, *ask-Valerie.eu* is available (for testing) in **English, Italian, French, Spanish, Finnish, Polish,** and **Dutch**. In October 2016, we established contacts to help translation into Czech, Romanian and Hungarian. We will seek assistance from the national contact points of the European Rural Development Network, to expand our language portfolio for maximum outreach.

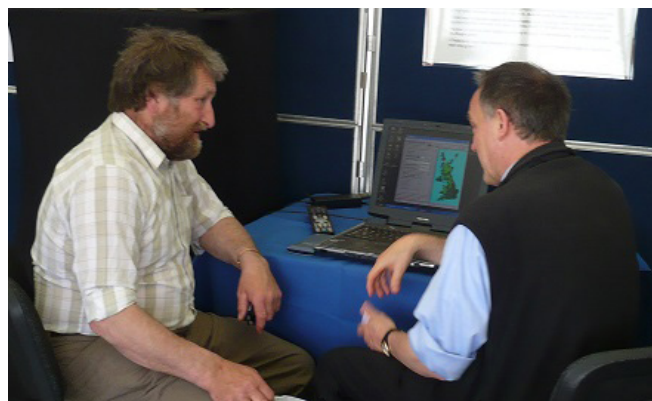## *Vocabulary: key concepts relevant to sustainable agriculture and forestry*

With the help of case study partners, we started by collecting terms from the case studies, both **scientific** and **colloquial**, and then expanded these with the help of domain experts. Topics include crops and cropping systems; soil, water and nutrient management; integrated pest management; supply chains; waste recycling; ecosystem services and climate; and many of its underlying principles and components such as management tools, techniques and machinery; field operations; species of crop, weeds, pests, diseases and other organisms; soil and crop processes; infection mechanisms; control strategies, etc. Such a vocabulary – also called **ontology** – is never complete. Nevertheless, with over 6,000 terms we are now at a stage where the vocabulary can be effectively used and tested in *ask-Valerie.eu*.

While existing ontologies were used from the start for inspiration and the copying of useful elements, we aim to engage more actively now in consortia that work on ontology **unification**, notably GACS (the Global Agricultural Concept Scheme).

The VALERIE ontology was built with the help of ROC+, a tool designed for organizing terms into a structured vocabulary, with defined synonyms, and hierarchical and functional relationships. In the process, we improved the ROC+ tool.

Content management

Up to summer 2016, *ask-Valerie.eu* was developed using a very limited collection of documents, sufficient to evaluate functionalities of the tool. From then onwards, we started contacting national or regional holders of **repositories** (large collections of documents written in the local language) with the aim of formalizing collaboration with a few major repositories per country. These represent a small fraction of some 50 relevant repositories we identified.

Repository holders include levy boards, farmer cooperatives and unions, extension bodies, universities and (regional) governments. Their documents will be **better searchable** – and by a wider community - based on prior annotation with the VALERIE ontology, and they will receive *ask-Valerie.eu* users on their own, **original webpages**. Examples are the repositories from Emilia Romagna and from Veneto Agricoltura in Italy (already annotated), and the Groen Kennis Net repository for 'green education' in the Netherlands (processing to start soon). Such aggregators may also include selected papers from trade journals.

The second major category are **scientific** documents: journal papers and book chapters. Some are **Open Access** sources, others give access-on-**payment**-**only**, and such conditions will be maintained in *ask-Valerie.eu*. Elseviers Publishers have made selected journals within the VALERIE domain available for experimentation within the project. A large aggregator of scientific documents is the **AGRICOLA** database by the USDA National Agricultural Library in the US; we obtained their permission to grant access to their documents through *ask-Valerie.eu*, but are still processing this immense collection. From the European CORDIS database, we were able to annotate some 1300 documents that are now accessible via *ask-Valerie.eu*.

Inventory of Innovations and research gaps

The VALERIE project is also developing an **inventory of innovations** in the domains of sustainable agriculture and forestry (see above topics under Vocabulary), and to chart areas where more research is necessary to make progress in the field (**research gaps**).

In 2015 we produced a provisional list of almost 500 innovations, including: applications of zeolites to crop protection; impact of wood ash fertilisation on carbon sequestration in forests; the use of hand-held sensors to improve N fertilisation management in wheat; constructed wetlands for the treatment of agriculture wastewater; use of LIDAR to improve forest management; and fertilisers made from bone meal. Innovations are described in **fact sheets**, where the purpose and principles of the innovation are explained and key references are provided. Where relevant, these fact sheets also list European projects that contributed to the development of the innovation. The fact sheets and associated literature are part of the *ask-Valerie.eu* document base, but innovations are also documented in the InnoVal database, for use within the project. (Over 200 fact sheets were completed by late 2016.)

In 2016, the first version of a list of major research gaps was produced by the same teams that are involved in producing the list of innovations and the associated fact sheets.

Interactions with EC services and related partners

Foremost among EC contacts for VALERIE is the **EIP-AGRI Service Point**, through our Joint Technical Committee where experts from both groups plan the integration of the *ask-Valerie.eu* tool into the Service Point platform.

Project staff are also regular attendees at **SCAR** Strategic Working Group on AKIS SWG meetings, through which we contributed a chapter on e-Science to the 3rd Foresight Report.

We work with the **CORDIS** Unit (Publications Office of the EU Directorate C - Dissemination and Reuse, EU Bookshop and, Luxembourg) to annotate all materials held in CORDIS from the FP5, FP6, FP7 and Horizon2020 research programmes, in order to enable access via *ask-Valerie.eu*.

Other relevant connections are with the Secretariat of the Joint Programming Initiative on Agriculture, Food Security and Climate Change (**FACCE-JPI**); and with selected **Thematic Networks** under **H2020**.

Aims for 2017

Important aims and activities for the final year of the project are:

- Thorough **validation** of *ask-Valerie.eu* with 'communities of practice' in the project case studies
- Evaluation and validation of the tool (test version) by the public **beyond the project** boundaries
- Expanding the document base by adding **more repositories** from partner countries
- Connecting to (more) **aggregators of scientific** documents, national and international
- Expanding the VALERIE **ontology** and its **translations** (terms; languages; Thematic Networks)
- Exploring the options for **unification** with existing international ontologies, notably GACS
- **Summarizing** existing **knowledge** for innovation in the form of more 'innovation fact sheets'
- Expanding the **communication** dimension of *ask-Valerie.eu*
- Implement functionalities for **users to contribute** to *ask-Valerie.eu* (ontology, fact sheets, and document base)
- Exploring with EC units and European projects – including H2020 Thematic Networks – a possible role for *ask-Valerie.eu* as a **shared gateway** to European information for sustainable agriculture and forestry
- Further design and implementation of mechanisms with the EIP-Service Point for **embedding** and **sustaining** *ask-Valerie.eu* beyond 2017

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