



*a semantic approach by*

**ALERIE**

## **Boosting Outreach of Research for Innovation in Sustainable Agriculture and Forestry**

*Hein ten Berge et al. – Wageningen Plant Research*

**Valerie** 

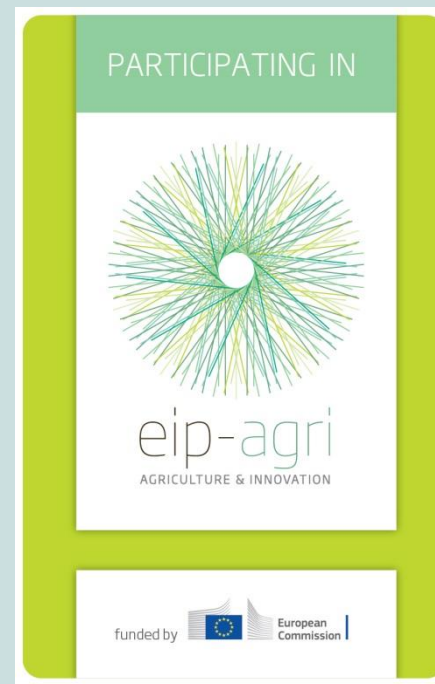
ERDN, Budapest, October 5, 2016

# VALERIE in a Nutshell

## what ? – for whom ? – how ?

Valerie

- Easy access to knowledge for innovation
- Communication platform for practitioners
- Quick access to EU-funded research outcomes
- Stakeholder-driven process (next presentation)
  
- Practitioners in agriculture and forestry (advisers, farmers, foresters)
- Actors in EIP-OG's and Thematic Networks
- *“ask-Valerie.eu”* - accessed via EIP-AGRI portal  
**‘Our Tool’**



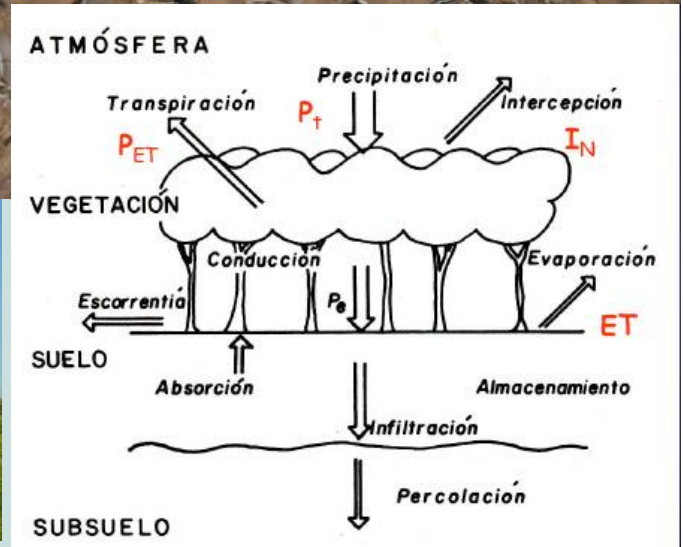
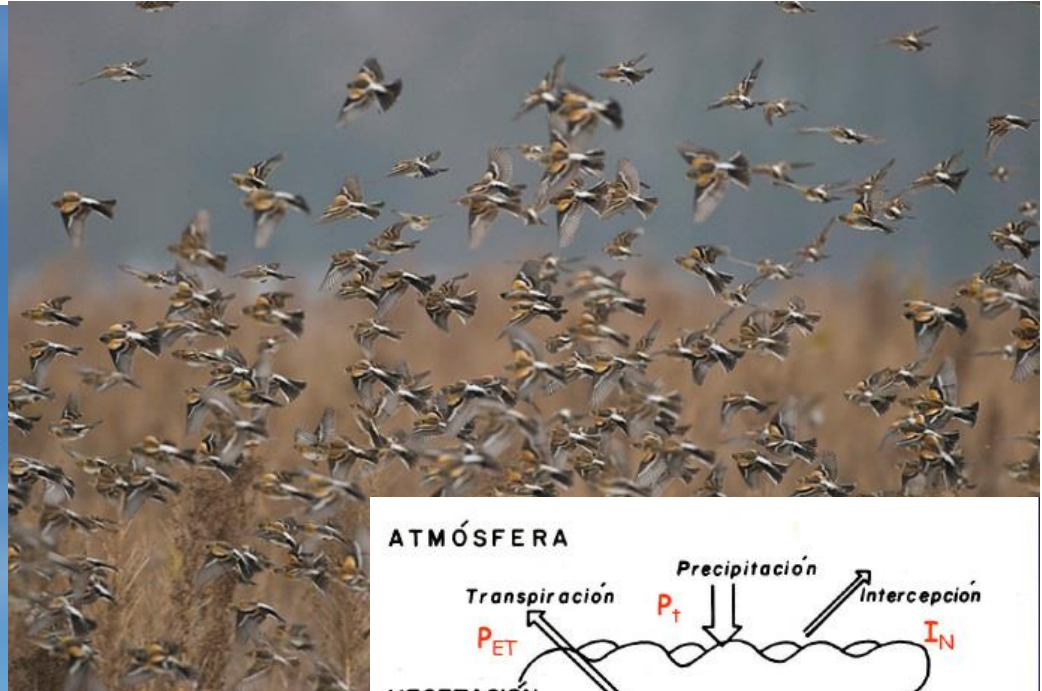
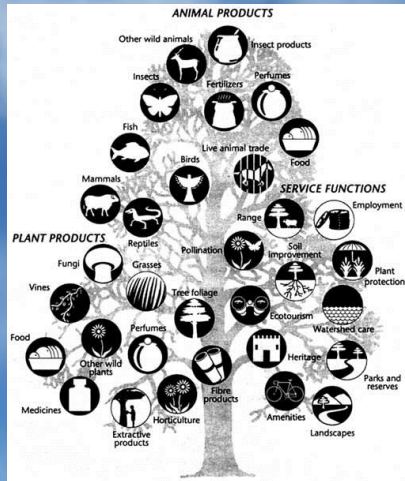
# **Thematic Domains**

in productive and sustainable  
agriculture and forestry

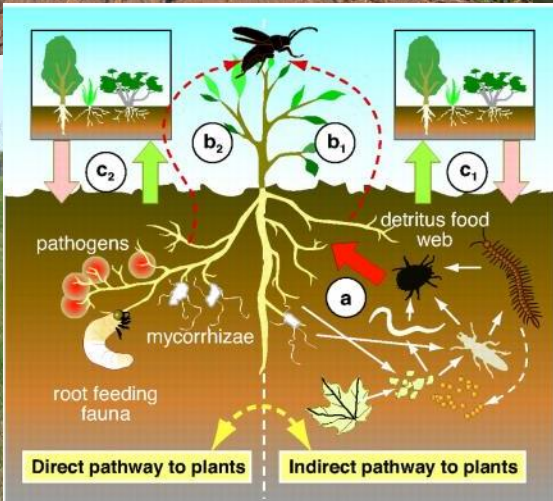
# Crop rotation including soil cover management and integrated pest management (IPM)

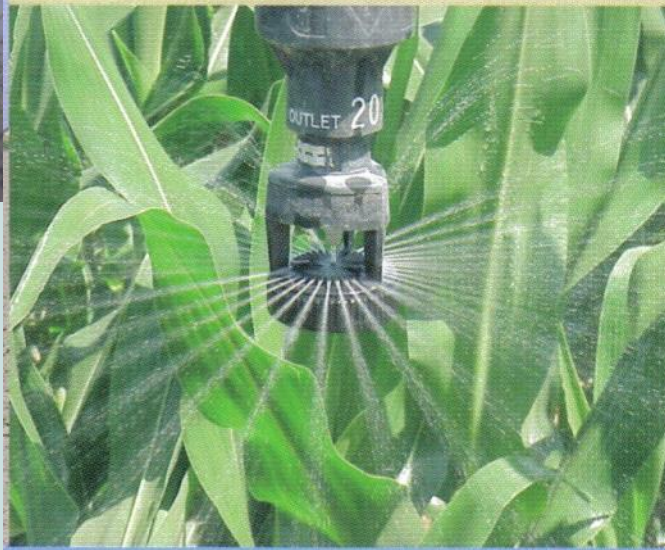


# Eco-system and social services in agriculture and forestry

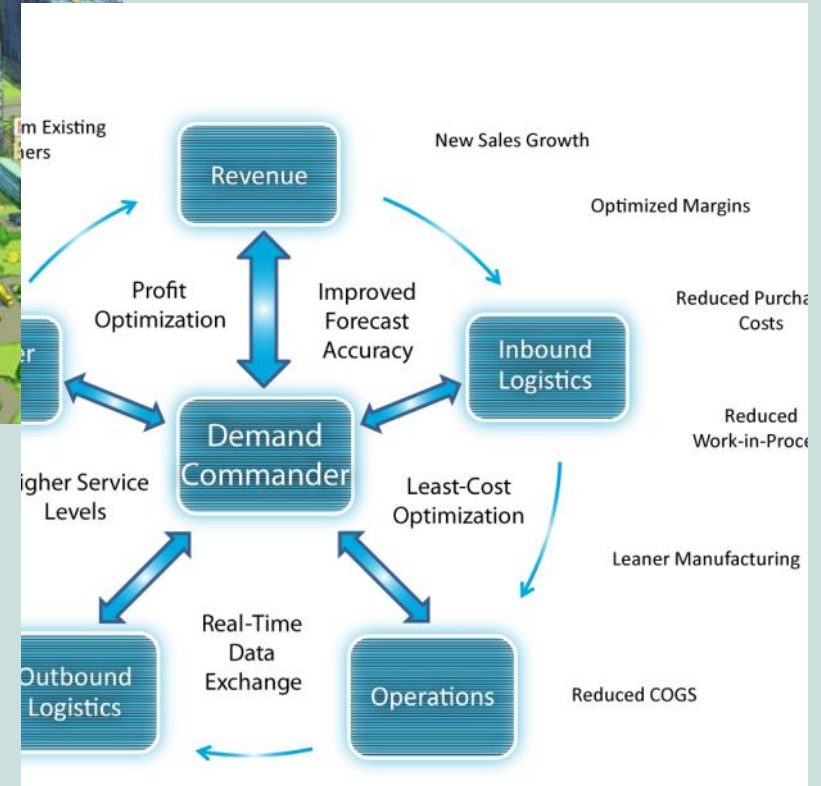


# Soil management as an integrated agro-ecological system





# Sustainable integrated supply chain services and tools, innovative farm management



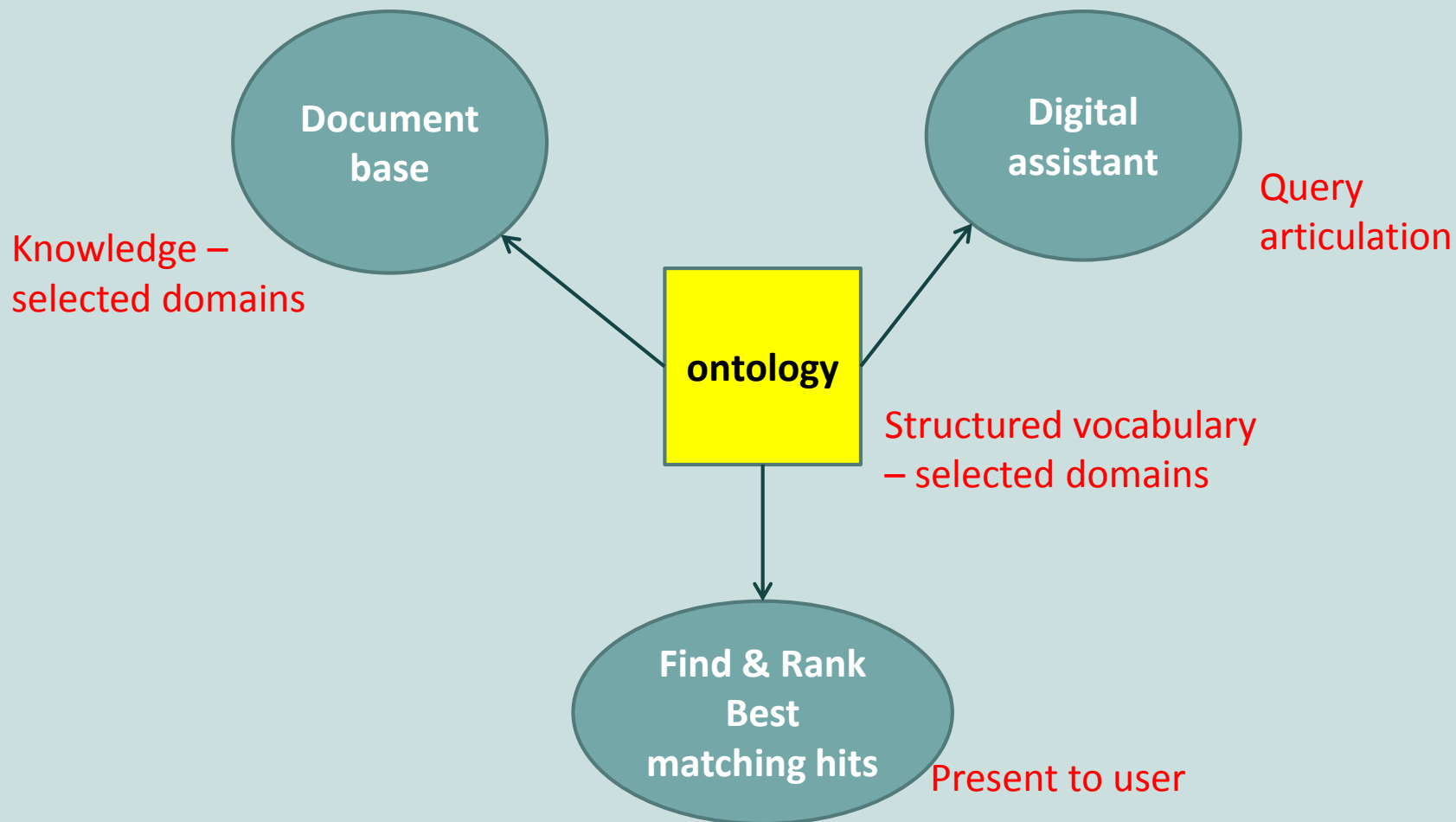


# Recycling and smart use of biomass and food waste: waste generated in primary production



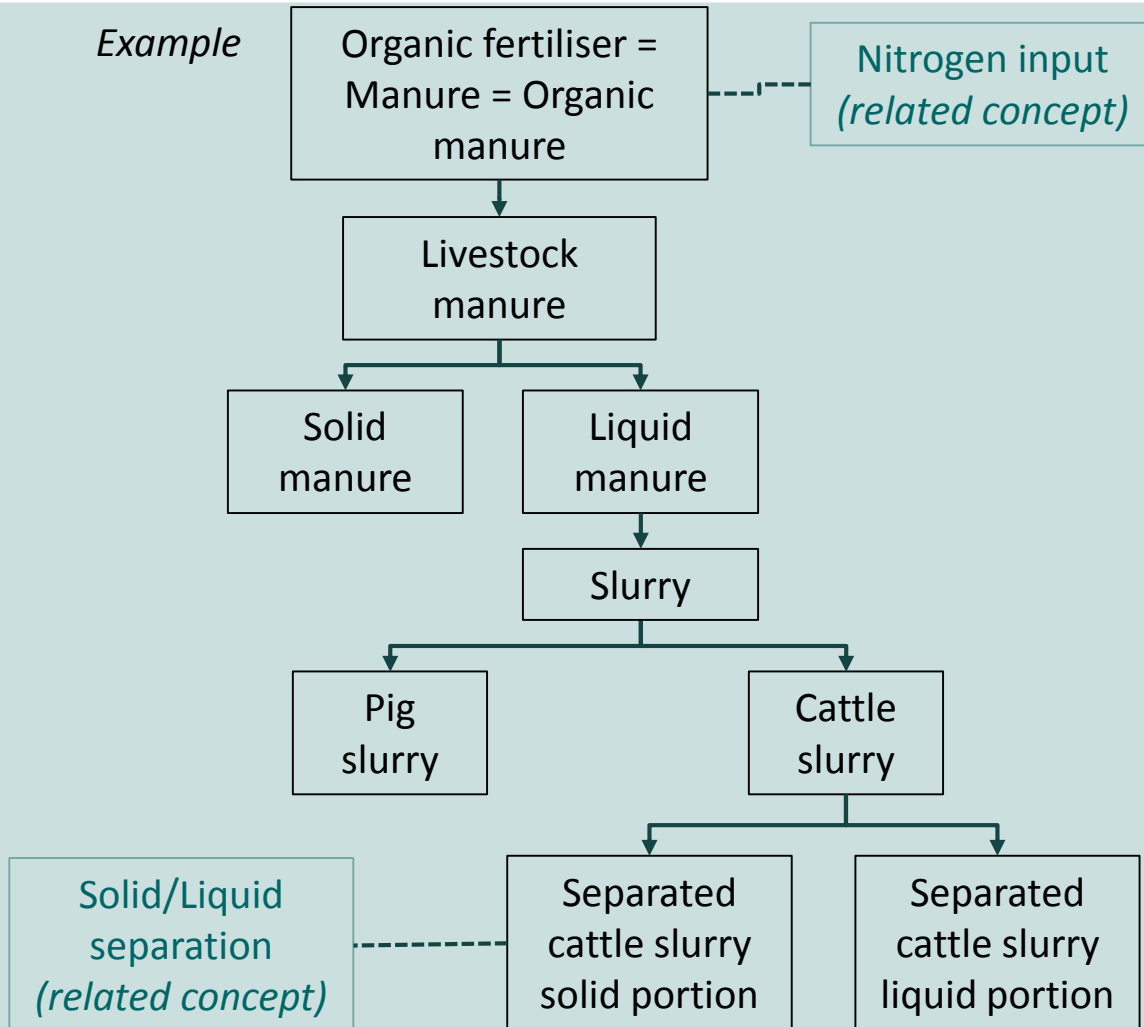
*ask-Valerie.eu*

components  
and intended  
functioning



- **Set of concepts**
- **Built by experts**
- **Hierarchy**
- **Relations**
- **Synonyms**
- **Languages:** English, Finnish, French, Italian, (Polish), Spanish, Dutch

Example



## Ontology

- Structured knowledge
- Collection of '**Concepts**' (vocabulary)

## Automated annotation of documents

- Identifies terms from ontology
- Identifies relevant text fragments

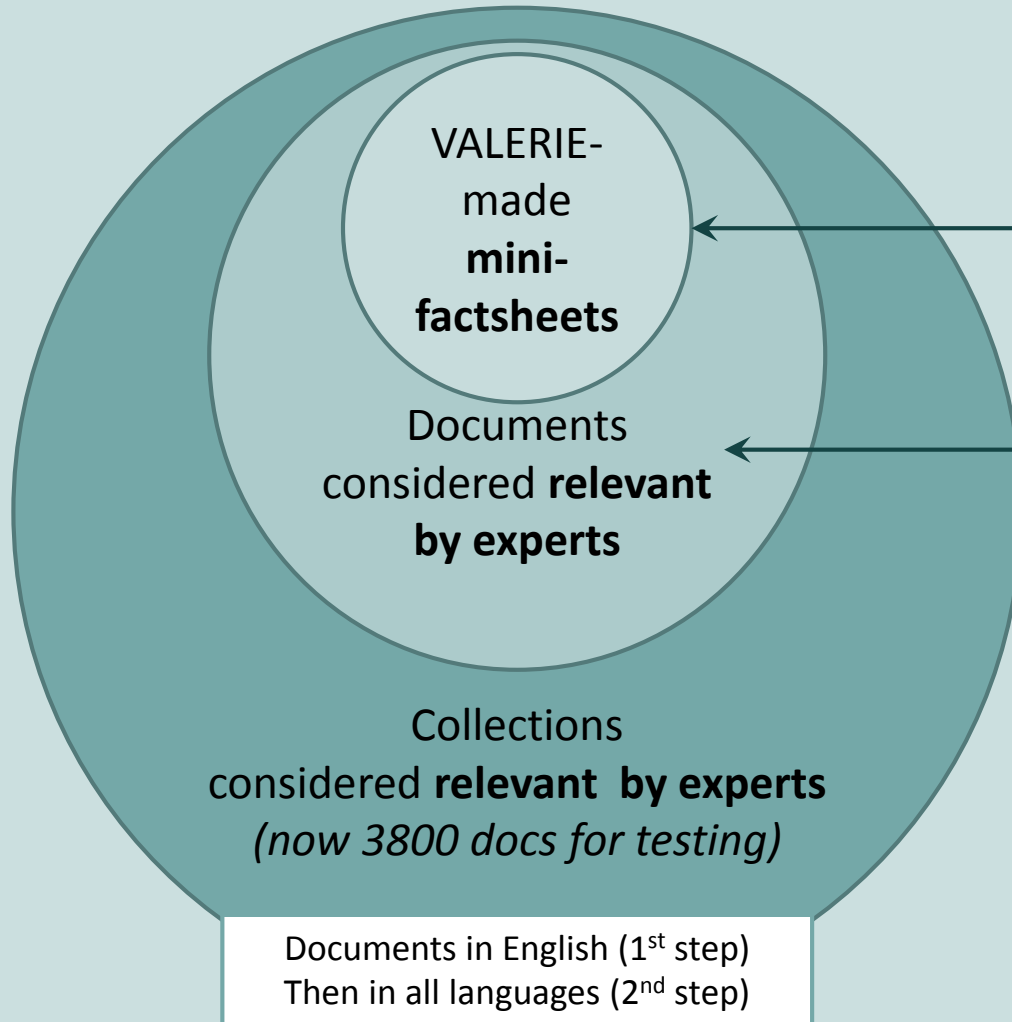


## Query articulation

- Enrichment
- Expansion / restriction
- User profiles

# Document base

## Three layers of documents



Each **mini-factsheet**  
describes one innovation

- Link to 6-8 documents
- Link to projects

*Documents* = scientific papers,  
technical papers, fact sheets,  
project reports, ...

Collections taken from existing  
repositories, e.g. *CORDIS*, *Teagasc*,  
*AHDB*, and many more

### Mini-factsheets describe innovations for farmers and foresters

- Each mini-factsheet focuses on **one innovation**
- A mini-factsheet contains:
  - A **description** of the innovation (50-200 words)
  - **Challenge** that the innovation aims to solve
  - **References** to few key (practical / scientific) documents
  - Links to **EU projects** and National projects
  - Links to the VALERIE **ontology**

## We have compiled a list of about 480 innovations

- **Examples:**

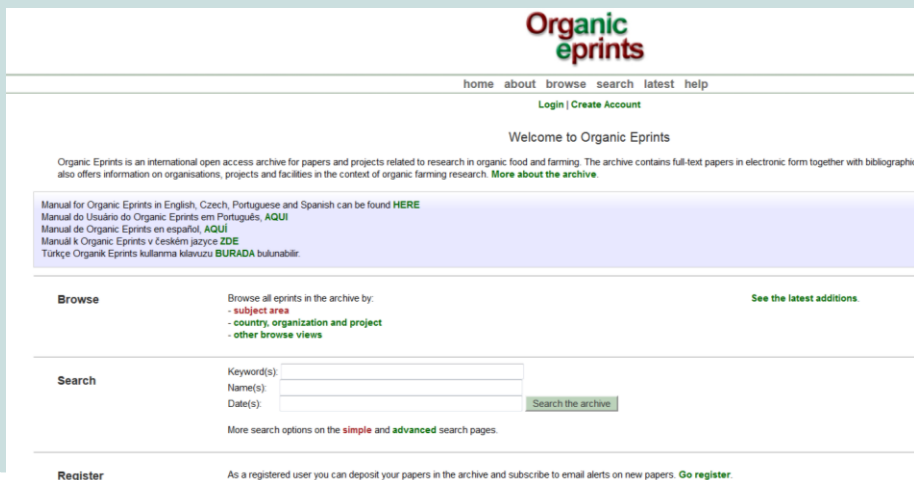
- *Applications of zeolites to crop protection*
- *Impact of wood ash fertilisation on carbon sequestration*
- *Hand-held sensor to improve N fertilisation management*
- *Constructed wetland for the treatment of agriculture wastewater*
- *Use of LIDAR to improve forest management*
- *Fertilizer made from bone meal*



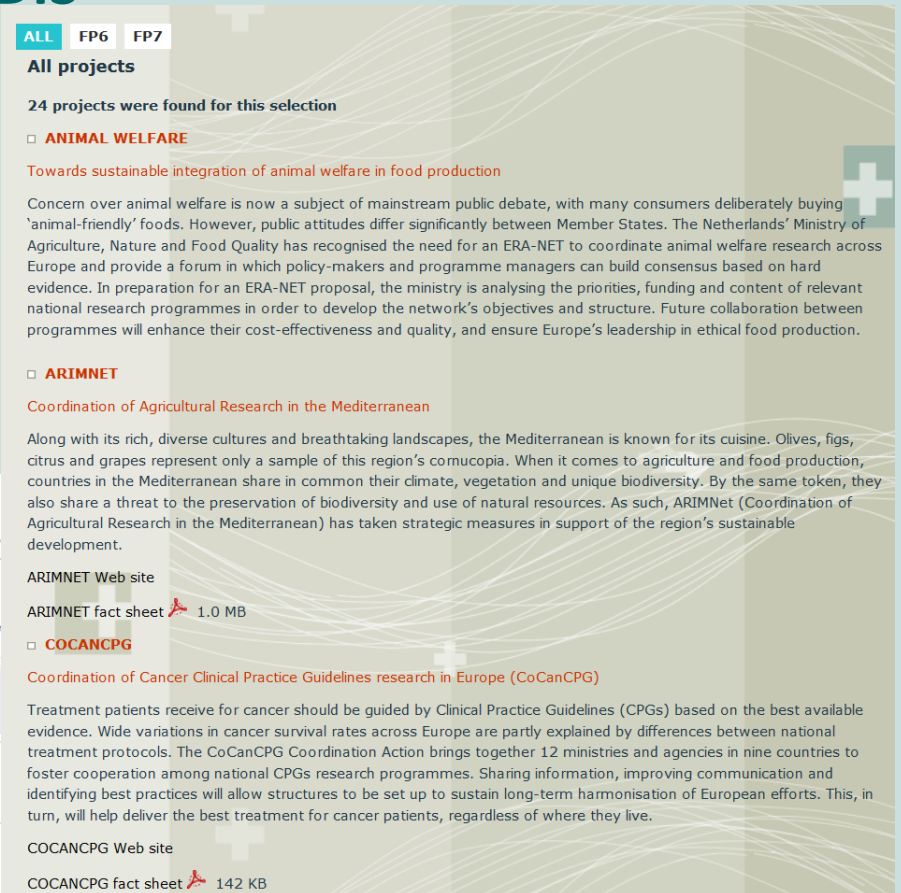


## Documents not accessed via CORDIS

- ERA-NET: 24 agricultural and forestry projects
- FACCE-JPI
- OrgPrints (18,422 documents)



The screenshot shows the homepage of the Organic Eprints archive. At the top, the logo "Organic eprints" is displayed. Below it are navigation links: "home", "about", "browse", "search", "latest", "help". There are also links for "Login" and "Create Account". A welcome message reads "Welcome to Organic Eprints". A paragraph describes the archive as an international open access archive for papers and projects related to research in organic food and farming. Below this, there are links to manuals in various languages: English, Czech, Portuguese, Spanish, and German. A "Browse" section lists filters: "subject area", "country, organization and project", and "other browse views". A "Search" section includes input fields for "Keyword(s)", "Name(s)", and "Date(s)", along with a "Search the archive" button. At the bottom, there is a "Register" section with a link to "Go register".



The screenshot shows a search results page for "All projects" in the ERA-NET. At the top, there are tabs for "ALL", "FP6", and "FP7". The page indicates that "24 projects were found for this selection". The first project listed is "ANIMAL WELFARE" with the title "Towards sustainable integration of animal welfare in food production". The abstract discusses the need for an ERA-NET to coordinate animal welfare research across Europe. The second project listed is "ARIMNET" with the title "Coordination of Agricultural Research in the Mediterranean". The abstract discusses the Mediterranean region's rich culture and biodiversity. The third project listed is "COCANCPG" with the title "Coordination of Cancer Clinical Practice Guidelines research in Europe (CoCanCPG)". The abstract discusses the need for Clinical Practice Guidelines (CPGs) based on the best available evidence. Each project entry includes a link to the project's web site and a fact sheet.

### Here local languages are important

- Examples in **French**
  - Institut Technique de l'Agriculture Biologique (ITAB)  
<http://www.itab.asso.fr>
  - Chambres d'Agriculture, e.g.  
<http://www.poitou-charentes.chambagri.fr>
  - <http://agriculture-de-conservation.com/>
- Examples in **Italian**
  - Centro Ricerche Produzioni Animali (CRPA)
  - Veneto Agricoltura
  - Condifesa Lombardia Nord-Est



PER ALIMENTARE L'AUTOSUFFICIENZA FORAGGERA

### Come valorizzare la qualità dei fieni aziendali

L'uso di foraggi aziendali può ridurre il ricorso ai mangimi acquistati, migliorando la competitività dell'allevamento. Si deve curare la loro qualità, per consentirne il massimo utilizzo, assicurando la loro freschezza, l'assenza di micotossine, basso contenuto di nitrati e spore di clostridi, e quella dei fieni nella conservazione e somministrazione all'animale.

**di Marco Ligabue, Elena Bertolazzo, Roberto Devotto**

La qualità elevata dei foraggi rappresenta un fattore fondamentale per consentire la produzione di latte ad alto livello qualitativo, in particolare lattine e latte sterile. Il Parmigiano-Reggiano, per il quale il foraggio aziendale rappresenta una qualità molto importante della razione delle bovine.

In riferimento a questo aspetto è necessario ricordare che il quesito genera la definitiva approvazione da parte del

L'Unione Europea del nuovo disciplinare di produzione che, tra le altre modifiche, garantisce al consumatore, innanzi tutto, la provenienza dei singoli allevamenti dal 15 al 50%, secondo un quote medio ancora più stretto il legame del Parmigiano-Reggiano con il territorio di produzione.

La valorizzazione del foraggio all'interno della razione è quindi necessario al fine di aumentare l'autosufficienza foraggera dell'azienda zootecnica e, in tal modo,

**GLOSSARIO**

**Clostridi batterici:** batteri che hanno il loro habitat naturale nel terreno e possono compromettere la qualità dei foraggi a lunga stagionatura.

**Fitone:** fitone derivati in grado di aggraverare in condizioni avverse.

**Alimenti:** insieme prodotti da fieno del genere *Aspergillus* che, se presenti negli alimenti zootecnici, possono nel latte, costituendo un grave rischio per la salute umana.

**Nitrati:** forma dell'azoto che può diventare tossica per gli animali se presente in quantità rilevanti nei foraggi.

do diminuire la dipendenza del mercato per l'acquisto dei mangimi e dei foraggi extra aziendali, va rilevato a tal proposito che questo voce rappresenta circa il 30% del costo di produzione del latte e che il prezzo delle materie prime è soggetto, e di fenomeno è stato particolarmente evidente negli anni recenti, a forti fluttuazioni. Numerose sono le evidenze che dimostrano come sia possibile, anzitutto, nella razione di bovine da latte per la produzione di Parmigiano-Reggiano, le proteine forate con la soia con qualità di un fieno di alta qualità di elevata qualità. In particolare, un lavoro recentemente condotto ha dimostrato che, con opportuni accorgimenti, l'utilizzazione di fieno di pregio può compensare l'apporto di proteine da soia, senza compromettere le caratteristiche organoleptiche del latte e le rese in foraggio, anche a fronte di una loro diminuzione della quantità di latte prodotto.

La valorizzazione del foraggio all'interno della razione ha come condizione necessaria che le tecniche di coltivazione e di raccolta consentano un'alta qualità, messa sia come salubrità, cioè assenza e presenza critici (in)giusti contenuti di sostanze che possano influire negativamente e compromettere la qualità del latte e la salute delle bovine, sia come qualità nutrizionale.

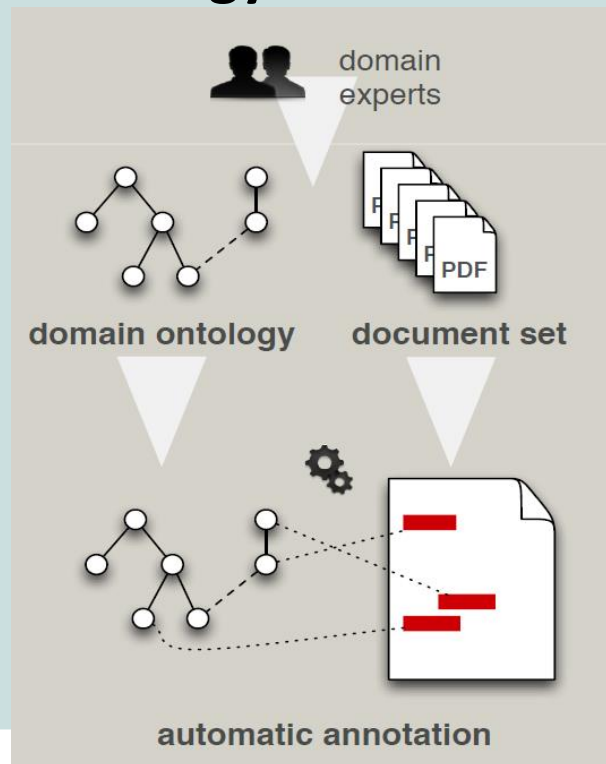
La condizione necessaria per valorizzare il foraggio nella razione è che le tecniche di coltivazione, raccolta e conservazione mantengano elevate le qualità di qualità.

57

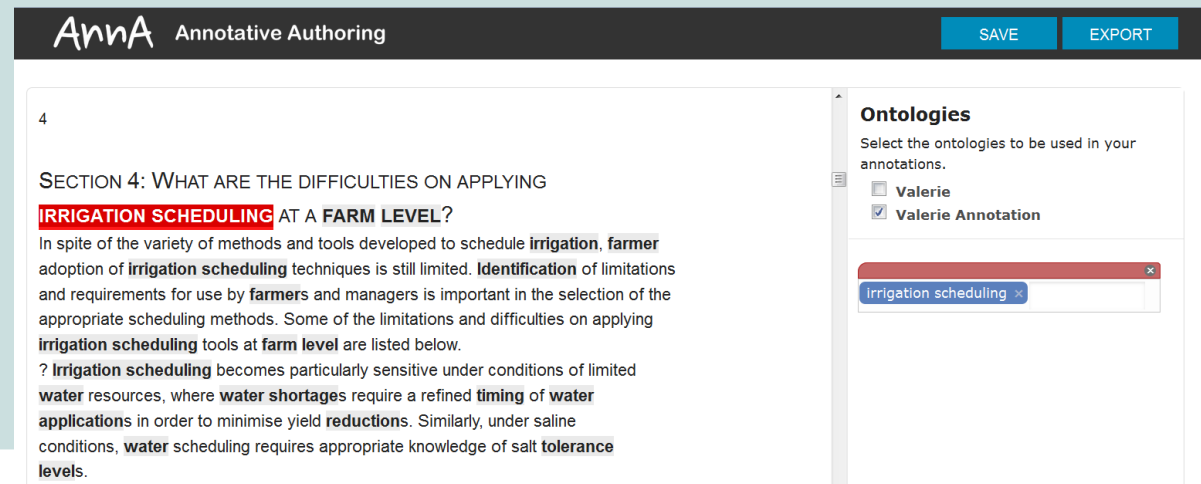
- **Scientific papers** from agricultural and forestry journals exploring with **publishers** (abstracts, snippets, full)
- Exploring collaboration with **Agricola** database (USDA National Agricultural Library)

*Before the user accesses the documents:*

A computer program **automatically annotates** documents, by identifying **phrases in the documents** that match **concepts in the ontology**



Annotation allows the user to find relevant documents and relevant parts of text within each document



Anna Annotative Authoring

SAVE EXPORT

4

SECTION 4: WHAT ARE THE DIFFICULTIES ON APPLYING **IRRIGATION SCHEDULING** AT A FARM LEVEL?

In spite of the variety of methods and tools developed to schedule irrigation, farmer adoption of irrigation scheduling techniques is still limited. Identification of limitations and requirements for use by farmers and managers is important in the selection of the appropriate scheduling methods. Some of the limitations and difficulties on applying irrigation scheduling tools at farm level are listed below.

? Irrigation scheduling becomes particularly sensitive under conditions of limited water resources, where water shortages require a refined timing of water applications in order to minimise yield reductions. Similarly, under saline conditions, water scheduling requires appropriate knowledge of salt tolerance levels.

Ontologies

Select the ontologies to be used in your annotations.

- Valerie
- Valerie Annotation

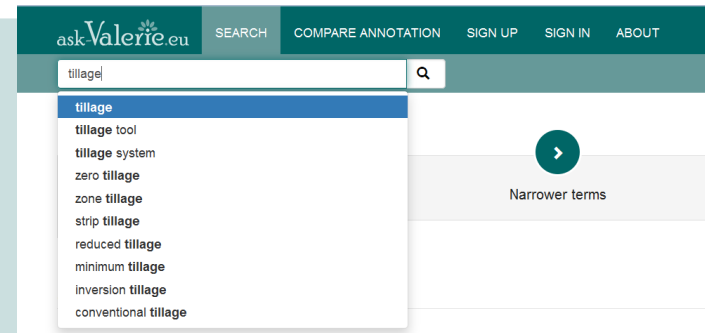
Irrigation scheduling

# Interaction with the user

## *ask-Valerie.eu* helps formulating queries

Valerie

- *ask-Valerie.eu* uses the ontology to **assist users in query articulation**
  - Autocomplete
  - Suggest related terms
  - Suggest narrower or broader terms
- **Finds more** documents based on **synonyms**, and expansion
- ⇒ Annotated documents are **retrieved** for the user

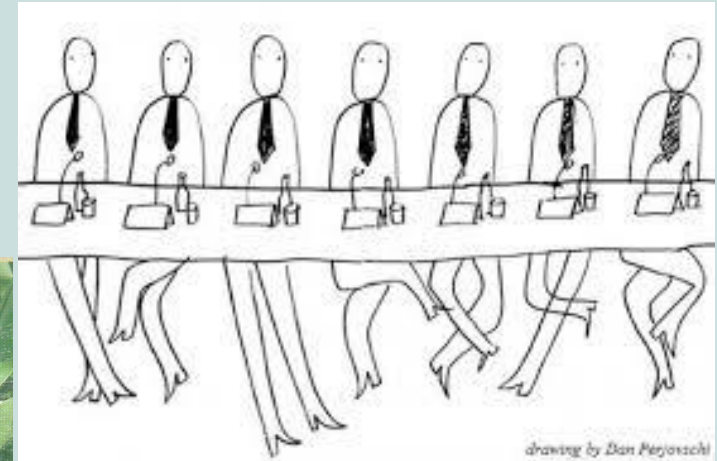
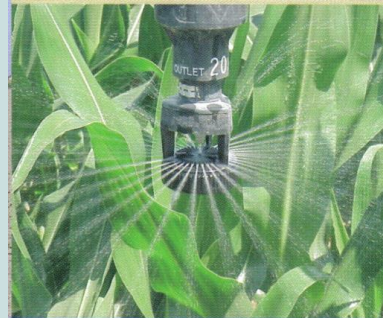


The screenshot shows the search results page for the query 'zero tillage'. The top navigation bar is the same as in the previous screenshot. Below the search bar, there are three buttons: 'Broader terms' with a left-pointing arrow and the text 'tillage system', 'Narrower terms' with a right-pointing arrow, and 'Related terms' with a minus sign and the text 'direct seeding | cover crop | tillage | conservation tillage | non-inversion tillage'. Below these buttons, the search results are displayed. The first result is titled 'Evaluation of monocropped and intercropped grain legumes for cover cropping in no-tillage and reduced tillage organic agriculture'. The snippet below the title reads: '[p.9] By contrast, the large dry matter production in the no-till system at K- in 2010 shows that with a suf?cient N2 ?xa- tion and without high weed pressure, the narrow-leaved lupin can be well suited for an organic no-till system. ... [p.9] These characteristics rec- ommend the normal leaved ?eld pea for use in no-till systems with moderate weed abundance in years with low precipitation prior to any other tested legumes. ... [p.1] whether certain legume cover crops could be equally successful... Read More'. Below the snippet are tags: 'no-tillage | no-till | innovation | weed | production | Fabaceae | pea | rainfall | innovation challenge | minimum tillage More Concepts' and a 'Download' button. The second result is titled 'Layout 1'. The snippet below the title reads: '[p.1] No-till and factors affecting no-till practice No-till, also known as direct drilling or zero tillage (conservation tillage in the USA and Australia), means sowing directly into the residues of the previous crop without any prior topsoil loosening. The objective of no-till is to reduce production costs while maintaining or increasing yields with possible added environmental benefits. Climatic, soil and cropping differences markedly influence farm suitability for no-till. Advantages of no-t... Read More'. Below the snippet are tags: 'no-till | zero tillage | innovation | no-tillage | cereal crop | field operation | direct seeding | conservation tillage | sowing | crop More' and a 'Download' button. At the bottom of the page, the text 'MF2902 No-till Wheat Management' is visible.

## Two axes

- **Theme-driven approach.**  
**Six thematic domains** charted by experts

- vocabulary
- innovations
- summarize as fact sheets
- expert panels



- **Stakeholder-driven approach**

## 10 case studies

- stakeholder communities
- innovation needs



- Initial query for a **specific** term, results for a **broader** or **narrower** terms
  - E.g. for query "wheat fertilisation", results for "small grain fertilisation"
- **Inter-language** search
  - E.g. query in French, results in English
- **Role of experts and stakeholders in organising knowledge**
  - Dedicated Document Base (Choosing document collections)
  - Building the ontology

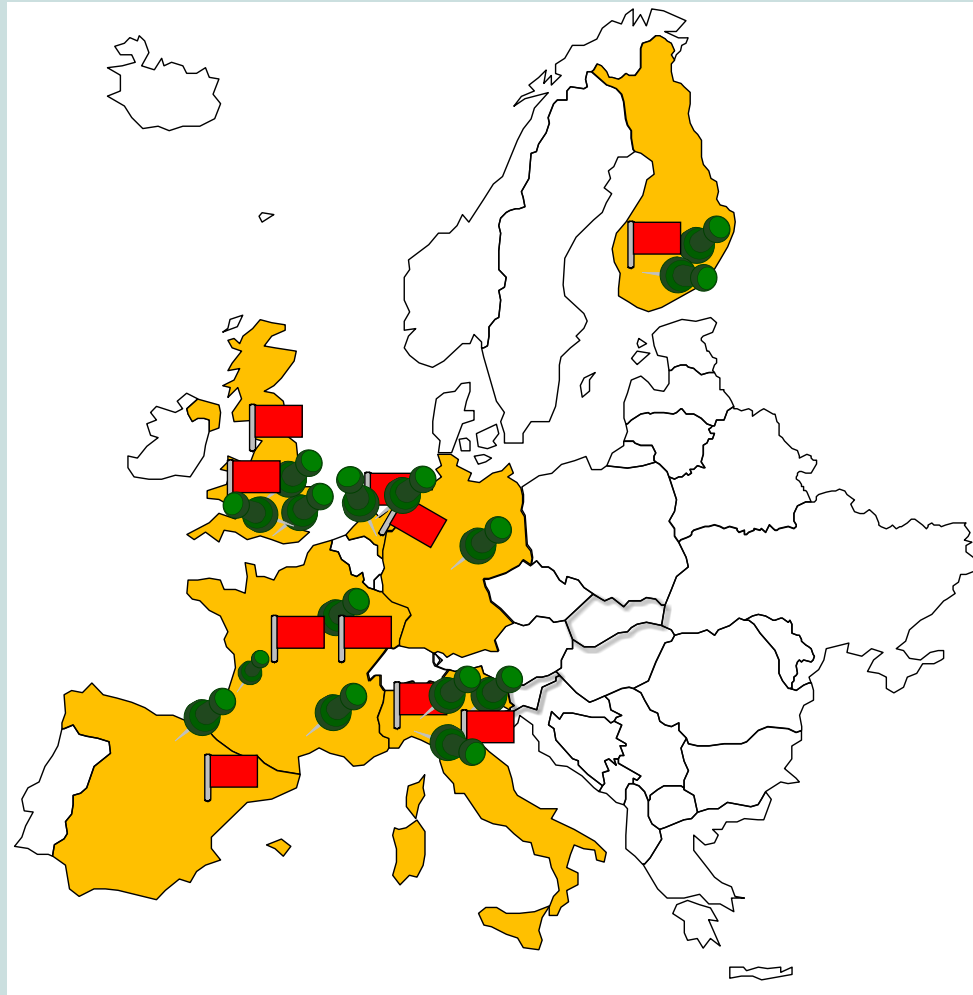
# Interactions and perspective



- **EIP-AGRI** Service Point – Joint Technical Committee
- **SCAR AKIS SWG** – contribution to 3<sup>rd</sup> Foresight Report (e-science)
- Publications Office of the EU Directorate C - Dissemination and Reuse, EU Bookshop and **CORDIS Unit, LUXEMBOURG**
- Secretariat of the Joint Programming Initiative on Agriculture, Food Security and Climate Change (**FACCE-JPI**)
- **EC Staff** at DG-Agric.&Rur.Dev. and DG-Res.&Innov.
- Other EU projects – incl. **H2020 networks**



- **Document base by end 2017:** large but **still limited**
- **Ontology:** thematic domains covered, but need continued **updating** / expansion
- Ontology: align (partly) with **other large ontologies:** Global Agricultural Concept Scheme (“GACS” by FAO, CABI, NAL);
- Expansion by **users: functionalities for uploading** new concept names, documents, mini-fact sheets
- Interacting with **other document bases**, knowledge systems (e.g., Open Aire), and knowledge providers (advisers; publishers)
- **Joint Portal** for **EC** funded programmes ?



[www.valerie.eu](http://www.valerie.eu)

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- The content of this presentation does not represent the official position of the European Commission and is entirely under the responsibility of the authors.

Thank you for your attention

Valerie

