endure
diversifying crop protection

The ENDURE Project: diversifying crop protection in Europe

Neal Evans – Rothamsted Research, UK

FOOD QUALITY AND SAFETY

SIXTH FRAMEWORK PROGRAMME

AARHUS UNIVERSITET ACTA

Agroscope Changins-Wädenswil Research Station ACW
Agroscope Liebefeld-Posieux Research Station ALP
Agroscope Reckenholz-Tänikon Research Station ART

Consiglio Nazionale delle Ricerche

Danish Agricultural Advisory Service

JKI Julius Kühn-Institute Federal Research Centre for Cultivated Plants

CIRAD

IBMA International Biocontrol agent Manufacturers' Association

IHAR INRA INRA Transfert Filiale de l'INRA

Universitat de Lleida

ROTHAMSTED RESEARCH

Scuola Superiore Sant'Anna di Studi Universitari e di Perfezionamento

Szent István University

WAGENINGEN UR For quality of life

Societal expectations for safe food and environmentally friendly agriculture

Crop protection: fragmented scientific knowledge and R&D community

Area 5.4.6 - Safer and environmentally friendly production methods
and technologies and healthier food stuffs.
Topic 1 - Reducing the use of plant protection products.

EC Contribution
11,2 M €

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European **N**etwork for
DURable **E**xploitation of
crop protection strategies

End-users (farmers & advisers)
+ industry, policy-makers, society at large…

Consortium composition

16 Partners – 10 countries

Research
- INRA – FR
- CIRAD – FR
- Rothamsted - UK
- JKI – D
- CNR – IT
- AGROS – CH
- Wageningen University- NL
- IHAR - PL

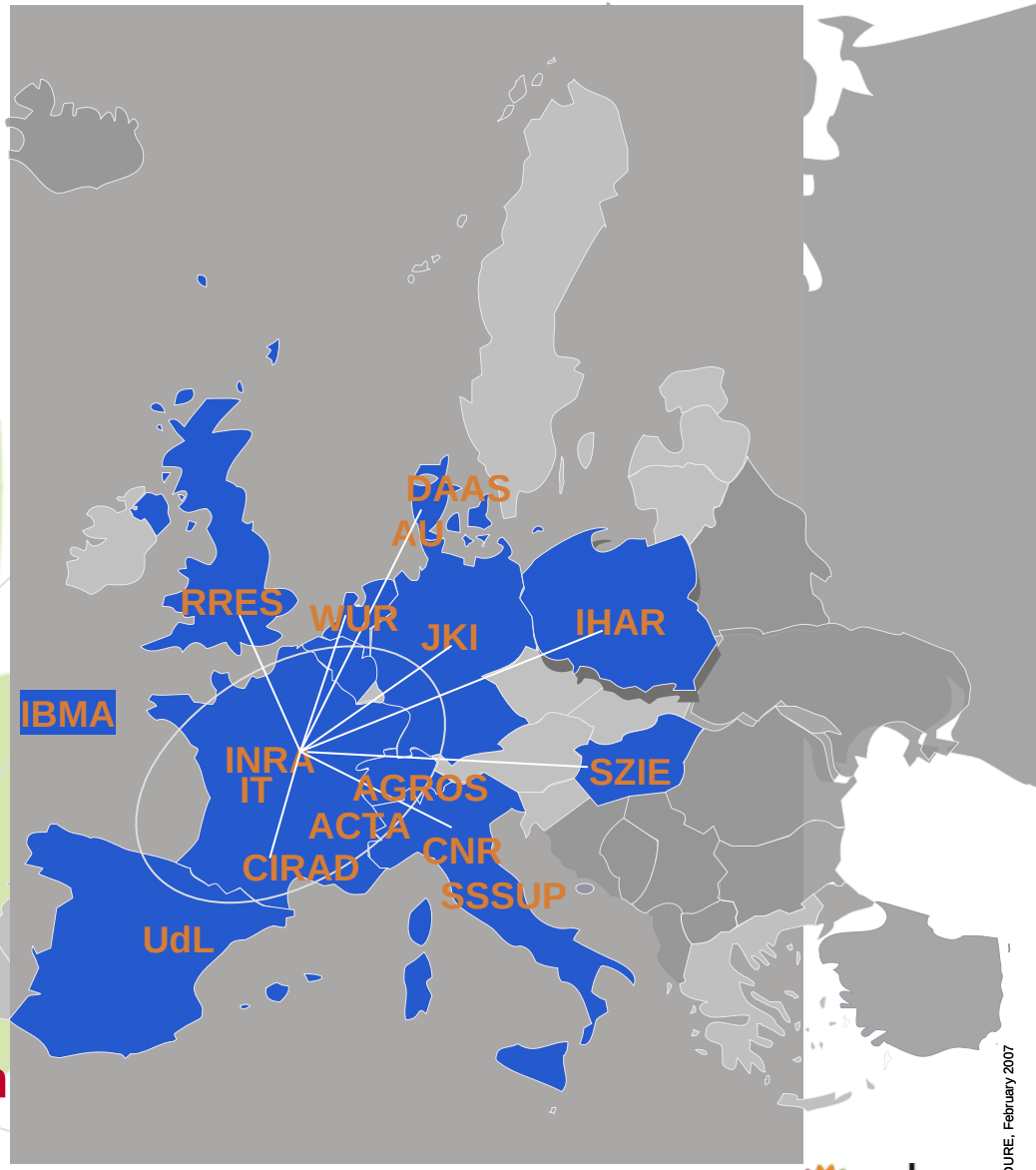
Education & R
- SSSUP - IT
- SZIE - HU
- UdL - SP
- Aarhus University - DK

Extension
- DAAS - DK
- ACTA - FR

Management
- IT - FR

Industry
- IBMA - Int.

In collaboration with
- INCO countries



Main objectives of the Network

bring together — available research capacity and resources
Programme, facilities, mobility

enhance — the research-to-R&D innovation process
Researchers → extension, practitioners

bring in — other stakeholders: industry, policy makers, civil society

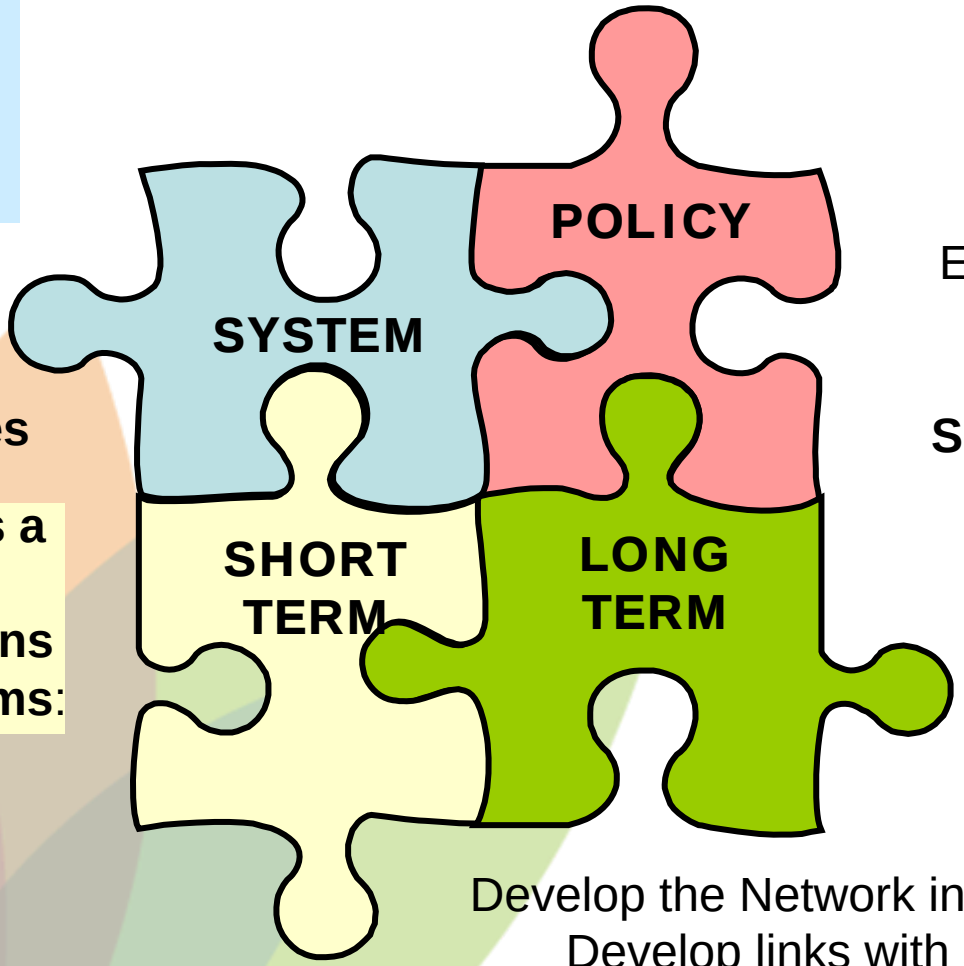
pass on — knowledge, know-how and resources through training and education

endure — by building a sustainable and trans-national institution → become an International reference

Project structure: Four integrating themes

Develop a holistic approach to sustainable pest management:
In the long-term, optimising existing systems.
Research Activities

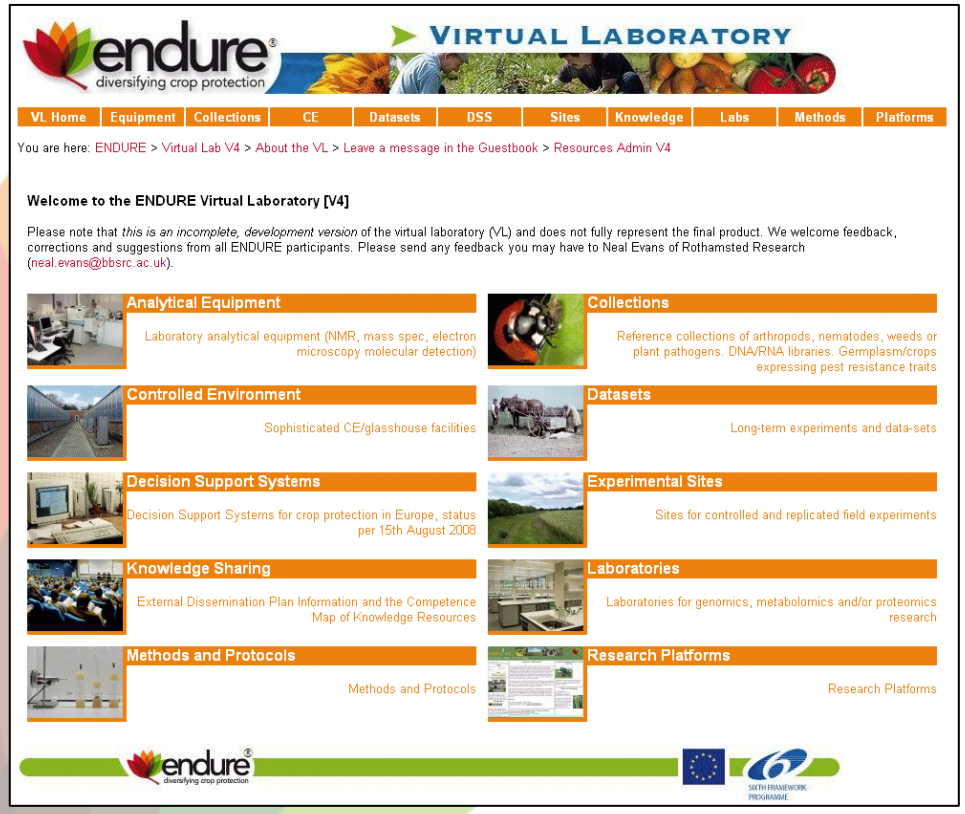
Provide end-users a broader range of short-term solutions to specific problems:
Allow farmers to respond to the new demands while maintaining competitiveness.
Research and Spreading Activities



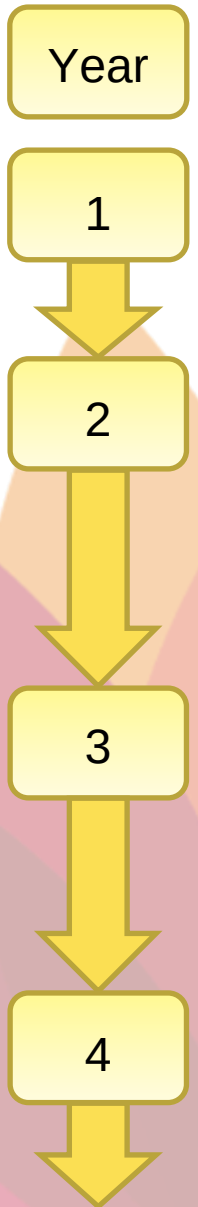
Take stock of and inform plant protection policy changes:
ENDURE will provide scientific support to policy makers.
Spreading Activities

Build a lasting crop protection community of research:
Create a coherent research strategy,
Develop the Network internal structure, and
Develop links with scientific community
Research, Integration and Spreading Activities

ENDURE Virtual Laboratory



ENDURE Virtual Laboratory



- **Information gathering**
  - Designed to “underpin” research within ENDURE
  - Originally, a central “repository” for:
    - Collections, Equipment, Knowledge/experience
- **Developed a “facilitating role”**
  - Compilation of relevant datasets
    - RA2.6C – meta-analysis of data held by partners
- **Now developed a modular approach to include “Research Platforms”**
  - EuroWheat – Lise Jorgensen presentation to follow
  - EUResist – Europe-wide platform on pesticide resistance
  - QuantiPest – Platform for field experimentation and pest quantification

ENDURE Virtual Laboratory

endure diversifying crop protection — VIRTUAL LABORATORY

VL Home | Equipment | Collections | CE | Datasets | DSS | Sites | Knowledge | Labs | Methods | Platforms

You are here: ENDURE > Virtual Lab V4 > About the VL > Leave a message in the Guestbook > Resources Admin V4

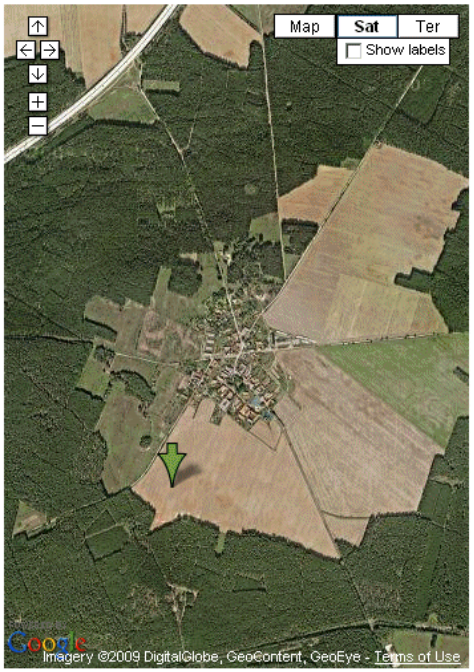
Experimental Field Sites [V4]

> Field Sites > View Map > Browse sites > Sites admin (private)

Dahnsdorf (BB)

JKI Institute for Strategies and Technology Assessment in Plant Protection: http://www.jki.bund.de/

Contact: bernd.hommel@jki.bund.de



View Larger Map

Main Activities

Strategies to decrease the intensity of pesticide use: strategies in plant protection concerning appropriate dosages

Pedoclimatic Data

Sandy Loess. . The dominant soil type is loamy sand and the average soil characteristics are 579 g kg-1 sand, 375 g kg-1 silt, 46.0 g kg-1 clay, 14.2 g kg-1 organic matter, and a pH of 5.8.

Mean annual temperature: 8.5°C and mean annual rainfall:526 mm with prolonged dry periods at the end of spring and early summer

Experiments in Progress

Long-term experiments to determine the minimum necessary PPP use

Crops Grown

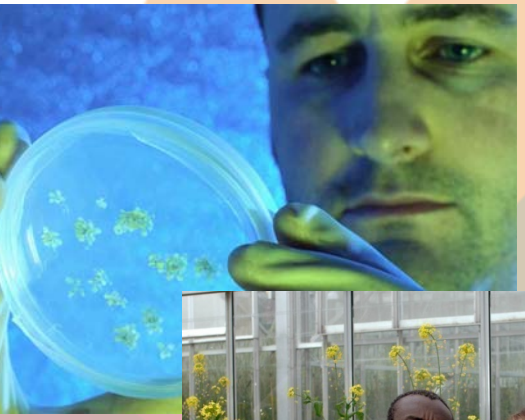
Pea, Winter barley, Winter oilseed rape, Winter rye, Winter wheat

Weeds studied

Apera spica-venti, Centaurea cyanus, Chenopodium album, Fagopyrum esculentum, Matricaria, Viola arvensis

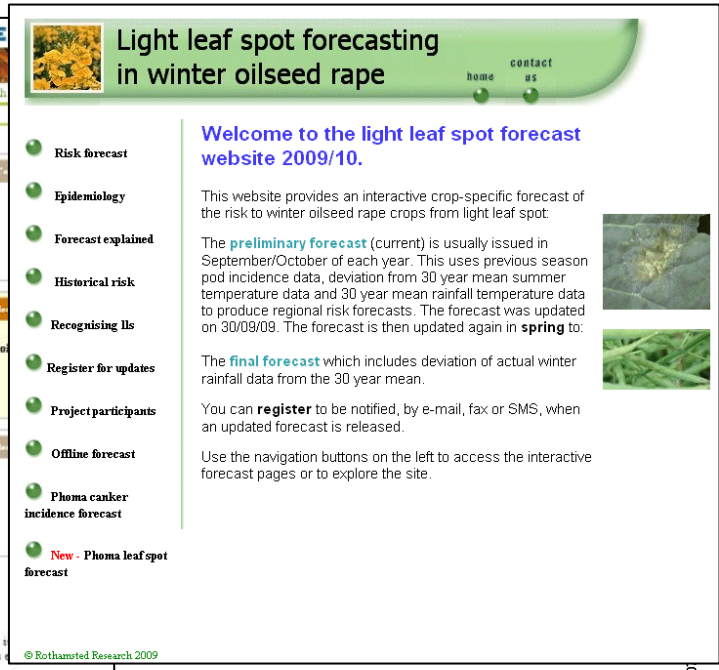
- Drill down into the database
- Find species specific information (EPPO codes)
- Detailed information for sites
- Contact person, access to facilities, knowledge and expertise

Training / Mobility



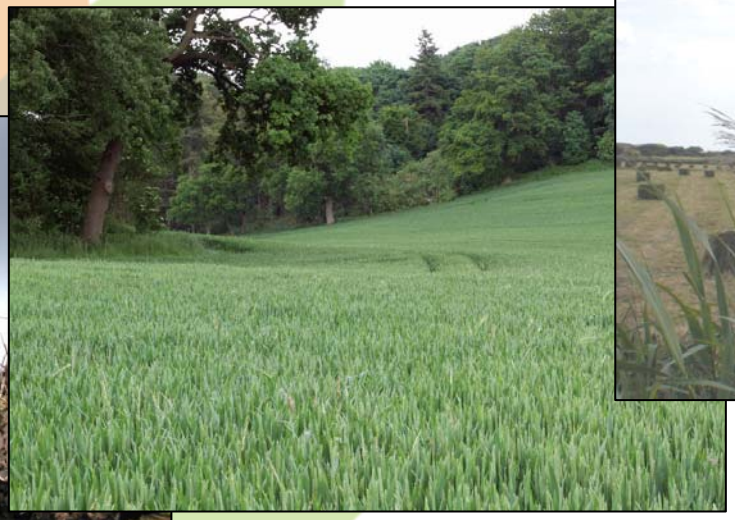
- **Training**
  - PhD Summer Schools (Volterra, Italy
    - 2007 - Biodiversity supporting crop protection
    - 2009 - Modelling approaches to support IPM
- **Mobility scheme**
  - Within the network
    - 2-3 months study periods
    - 48 Scientists within ENDURE network
    - Latest scheme closed last week
  - “Partners Outside Europe”
    - 2 scientists from Africa funded to date

ENDURE Information Centre (EIC)



Research – Desk Study

Designing Innovative crop protection strategies in arable crops – Winter crops based cropping systems



Winter crops based cropping systems

- **Main aim: To manipulate rotations to minimise inputs, whilst maximising outputs.**
- **Reduction in pesticide dose units or 'TFI' (Treatment Frequency Index)**
- **UK: main predominantly arable area of England**
- **<u>Most common</u> current rotation:**
  - winter wheat - winter wheat - winter oilseed rape
  - Mean annual TFI = 6.2

Design of AS & IS to improve environmental sustainability of UK rotations

- **Alternative Strategies**
  - Technologies developed but not yet **widely** implemented
  - Looking ahead 5-10 years
- **Innovative Strategies**
  - Innovative technologies currently being developed
  - Looking ahead 10-15 years
- **Main priorities:**
  - black grass containment
  - disease control in WOSR - more years between crops
  - pesticide targeting and stewardship
  - optimise value of natural enemies
  - spread the workload
  - maintain yield

Some tools for pesticide reduction in the AS system for the UK

- Crop sequence: Introduction of spring crops and greater taxonomic variety of cropping for pest management particularly containment of grass weeds.
- Lengthening the rotation: more years between OSR crops to help disease control
- Pesticide targeting and resistance management: ensure effective use of pesticides strictly according to need, using economic thresholds and decision support systems.
- Minimise tillage and chop straw wherever possible to conserve natural enemies and energy
- Spot mapping and targeting of weeds
- Use of resistant cultivars
- Conservation biological control: providing non-crop refuges and resources for natural enemies

Design of AS & IS to improve environmental sustainability of UK rotations

Rotation no.	System	No. years	Year 1	Year 2	Year 3	Year 4	Year 5	Comments
-	Current	3	WW	WW	WOSR			
I	AS	4	WW	S Beans	WW	WOSR		Heavier soils
II	AS	5	WW	S Beans	WW		WOSR	Lighter soils
III	IS1	5	WW	S Beans	WW	S Barley / SW / Fallow		Spring crops for reduced TFI and containment of grass weeds. Fallow to manage severe grass weed problems
IV	IS1	4	WW	S Beans	S Barley / SW /		SR	

Estimate up to 39% reduction in TFI

Estimate up to 57% reduction in TFI

After ENDURE?

- **First EU-funded NoE to have a legacy**
  - ENDURE now a brand!
- **Tools developed (VL, EIC) will be maintained**
- **Considerable commitment from the main partners of ENDURE**
- **Development of the European Arable Group (EAG)**

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