

The ENDURE Project: diversifying crop protection in Europe

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FOOD
QUALITY
AND
SAFETY





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 €

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



Consortium composition



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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

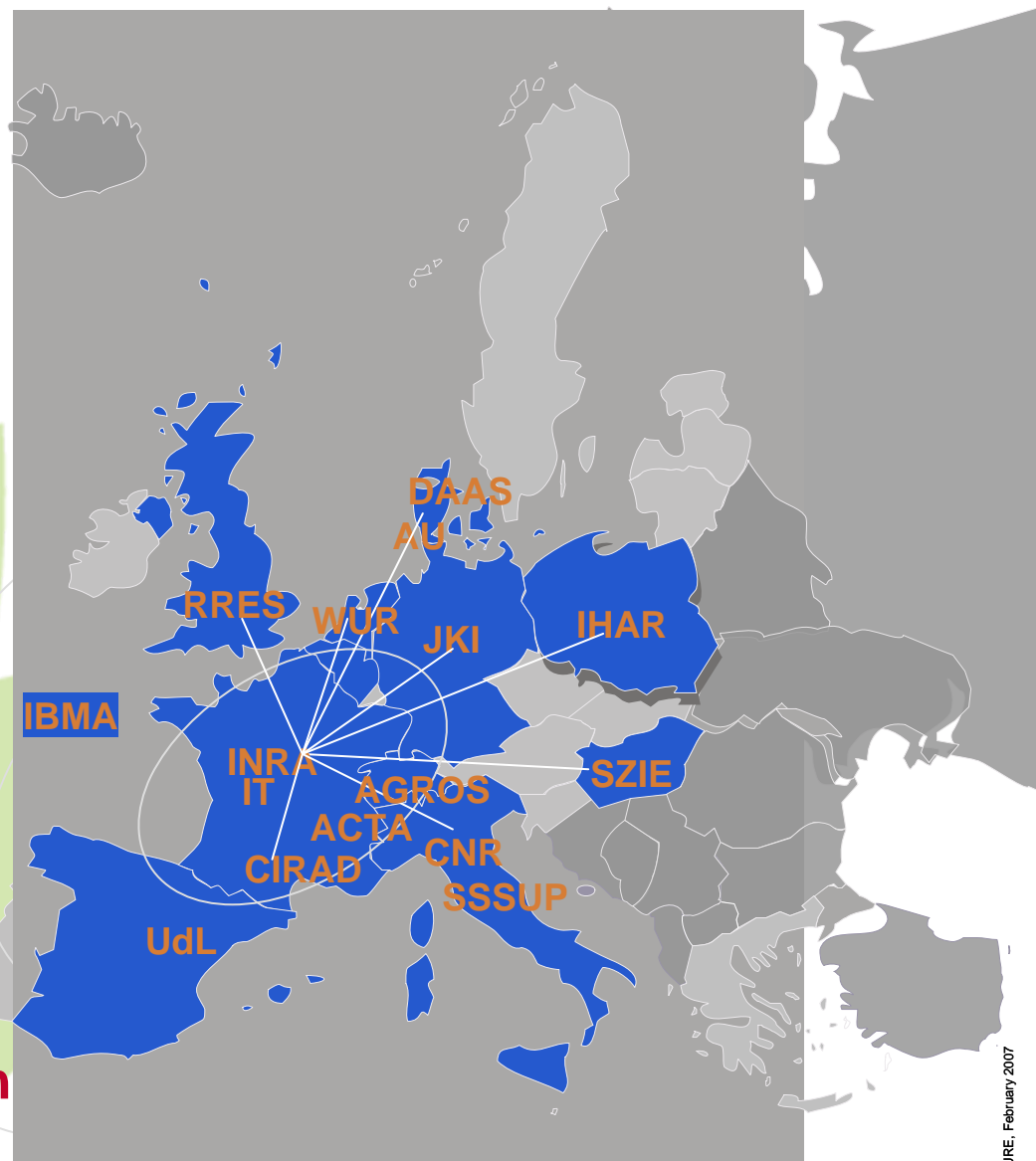
- **IT – FR**

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:

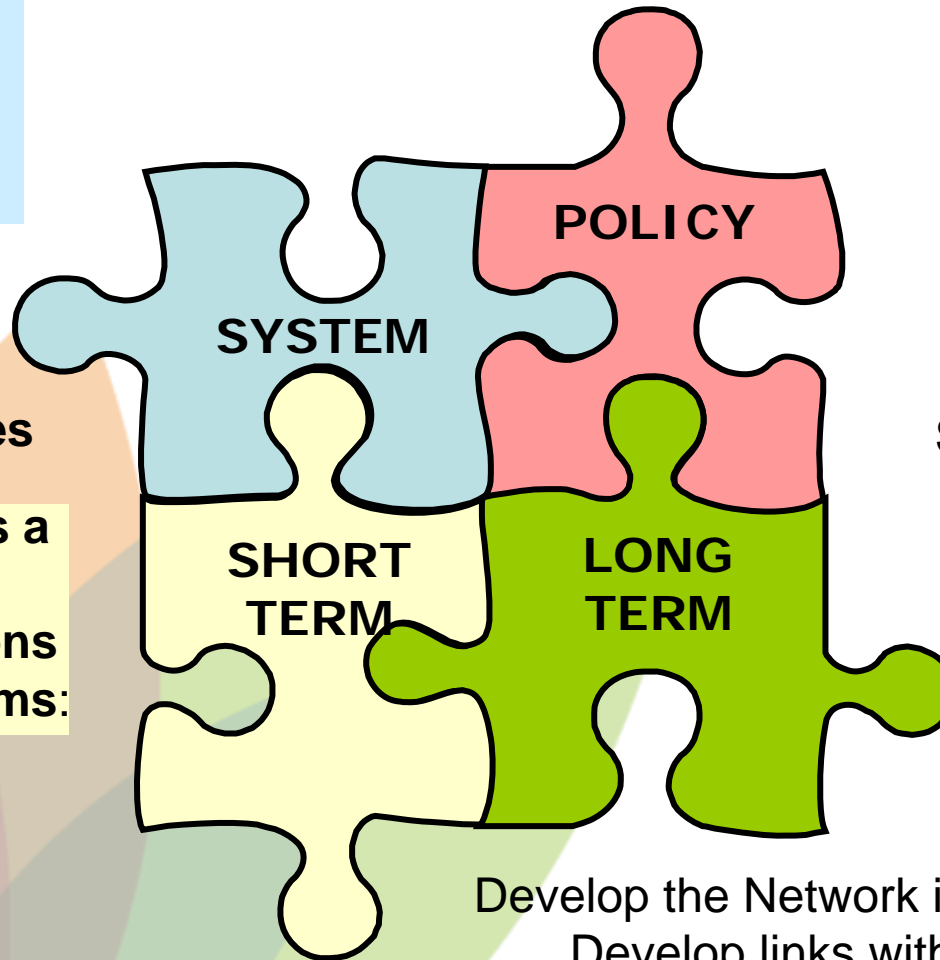
In the long-term, optimising existing systems.

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




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](#)

Welcome to the ENDURE Virtual Laboratory [V4]

Please note that *this is an incomplete, development version* of the virtual laboratory (VL) and does not fully represent the final product. We welcome feedback, corrections and suggestions from all ENDURE participants. Please send any feedback you may have to Neal Evans of Rothamsted Research (neal.evans@bbsrc.ac.uk).

<div style="border: 1px solid orange; padding: 5px; margin-bottom: 5px;">  <p>Analytical Equipment</p> <p>Laboratory analytical equipment (NMR, mass spec, electron microscopy molecular detection)</p> </div> <div style="border: 1px solid orange; padding: 5px; margin-bottom: 5px;">  <p>Controlled Environment</p> <p>Sophisticated CE/glasshouse facilities</p> </div> <div style="border: 1px solid orange; padding: 5px; margin-bottom: 5px;">  <p>Decision Support Systems</p> <p>Decision Support Systems for crop protection in Europe, status per 15th August 2006</p> </div> <div style="border: 1px solid orange; padding: 5px; margin-bottom: 5px;">  <p>Knowledge Sharing</p> <p>External Dissemination Plan Information and the Competence Map of Knowledge Resources</p> </div> <div style="border: 1px solid orange; padding: 5px;">  <p>Methods and Protocols</p> <p>Methods and Protocols</p> </div>	<div style="border: 1px solid orange; padding: 5px; margin-bottom: 5px;">  <p>Collections</p> <p>Reference collections of arthropods, nematodes, weeds or plant pathogens. DNA/RNA libraries. Germplasm/crops expressing pest resistance traits</p> </div> <div style="border: 1px solid orange; padding: 5px; margin-bottom: 5px;">  <p>Datasets</p> <p>Long-term experiments and data-sets</p> </div> <div style="border: 1px solid orange; padding: 5px; margin-bottom: 5px;">  <p>Experimental Sites</p> <p>Sites for controlled and replicated field experiments</p> </div> <div style="border: 1px solid orange; padding: 5px; margin-bottom: 5px;">  <p>Laboratories</p> <p>Laboratories for genomics, metabolomics and/or proteomics research</p> </div> <div style="border: 1px solid orange; padding: 5px;">  <p>Research Platforms</p> <p>Research Platforms</p> </div>
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Year

1

2

3

4

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



 **VIRTUAL LABORATORY**

diversifying crop protection

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

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

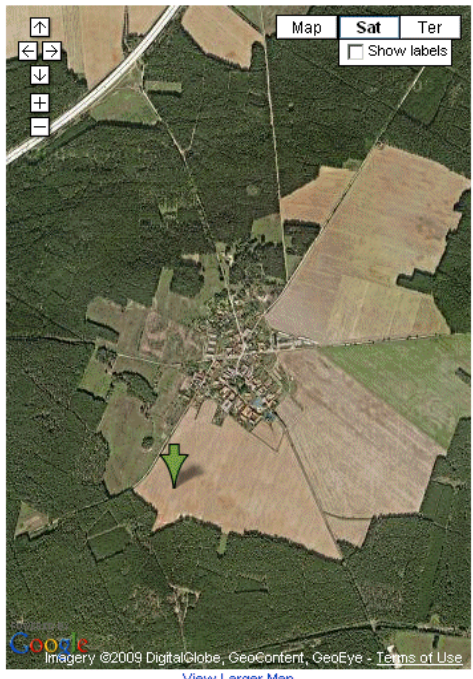
Long-term experiments to determine the minimum necessary PPP use

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

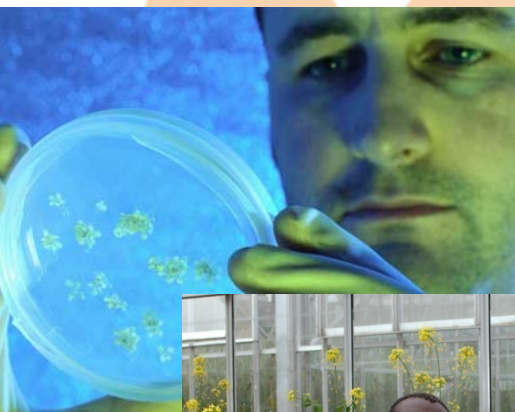


Training

- 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





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ENDURE Information Centre (EIC)

Reports (55), Projects (8) found

Reports Projects

55 Reports

first Previous 1 2 3 4 5 6 Next last

Crop	Pest	Measure	Region
Winter rape	Light leaf spot	decision support/ control	UK
Wheat	Fungi	decision support/ control	UK
Winter wheat	Striperust	winter ha...	DK
Winter wheat	Animalia	Tolerant ...	DK
Winter wheat	Animalia	Tolerant ...	DK

Light leaf spot forecasting for winter oilseed rape

summarised by Susannah Bolton
last update: 19/05/09

This website provides an interactive crop-specific forecast of the risk to winter oilseed rape crops from light leaf spot.

Winter rape / Brassica napus napus (winter) (BRSNW)
Light leaf spot of rape / Pyrenopeziza brassicae (PYRPBR)
decision support/ control / decision support/ control

United Kingdom

The light leaf spot forecast has been developed using the Defra-funded Winter Oilseed Rape Pest and Disease Survey results. The forecast is based on weather data and weather factors. At the start of the season, a prediction is made for each region which takes account of the average weather conditions for that region. This forecast is then updated periodically to take account of deviations in actual weather away from the expected values.

The factors important in predicting spring light leaf spot are:

- The amount of pod disease the previous summer.
It is thought that the summer pod disease produces inoculum to start the autumn epidemic.

Light leaf spot forecasting in winter oilseed rape

Welcome to the light leaf spot forecast website 2009/10.

- Risk forecast
- Epidemiology
- Forecast explained
- Historical risk
- Recognising lls
- Register for updates
- Project participants
- Offline forecast
- Phoma canker incidence forecast
- New - Phoma leaf spot forecast

This website provides an interactive crop-specific forecast of the risk to winter oilseed rape crops from light leaf spot.

The **preliminary forecast** (current) is usually issued in September/October of each year. This uses previous season pod incidence data, deviation from 30 year mean summer temperature data and 30 year mean rainfall temperature data to produce regional risk forecasts. The forecast was updated on 30/09/09. The forecast is then updated again in **spring** to:

The **final forecast** which includes deviation of actual winter rainfall data from the 30 year mean.

You can **register** to be notified, by e-mail, fax or SMS, when an updated forecast is released.

Use the navigation buttons on the left to access the interactive forecast pages or to explore the site.

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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**
- ❁ **Most common current rotation:**
 - winter wheat - winter wheat - winter oilseed rape
 - Mean annual TFI = 6.2



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



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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 maintenance of grass weeds.
IV	IS1	4	WW	S Beans	S Barley / SW / Fallow	WOSR		Fallow to manage severe grass weed problems

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)**

