endure

diversifying crop protection

Presentation of ENDURE to Italian stakeholders

ENDURE tools

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FOOD QUALITY AND SAFETY

SIXTH FRAMEWORK PROGRAMME

ENDURE TOOLS

Research

Extension and policy support

- ENDURE Information Centre
- ENDURE Networks of Experts

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ENDURE
tools for research

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/

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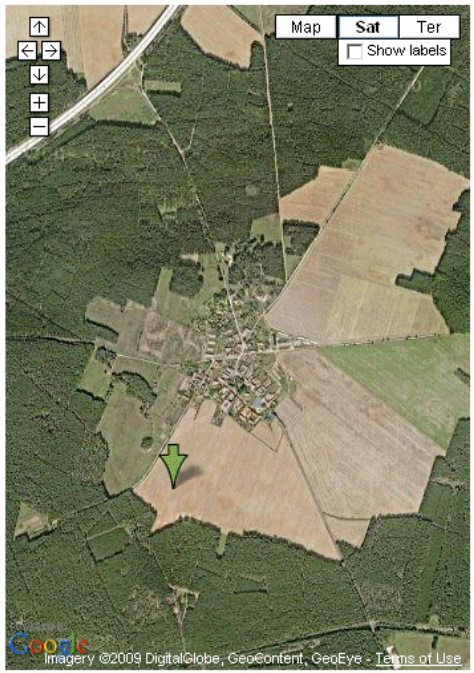

View Larger Map

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

Virtual Laboratory

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VIRTUAL LABORATORY

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

Experimental Sites

Sites for controlled and replicated field experiments

Laboratories

Laboratories for genomics, metabolomics and/or proteomics research

Research Platforms

Click to access Research Platforms

Research Platforms

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SIXTH FRAMEWORK

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ENDURE platforms

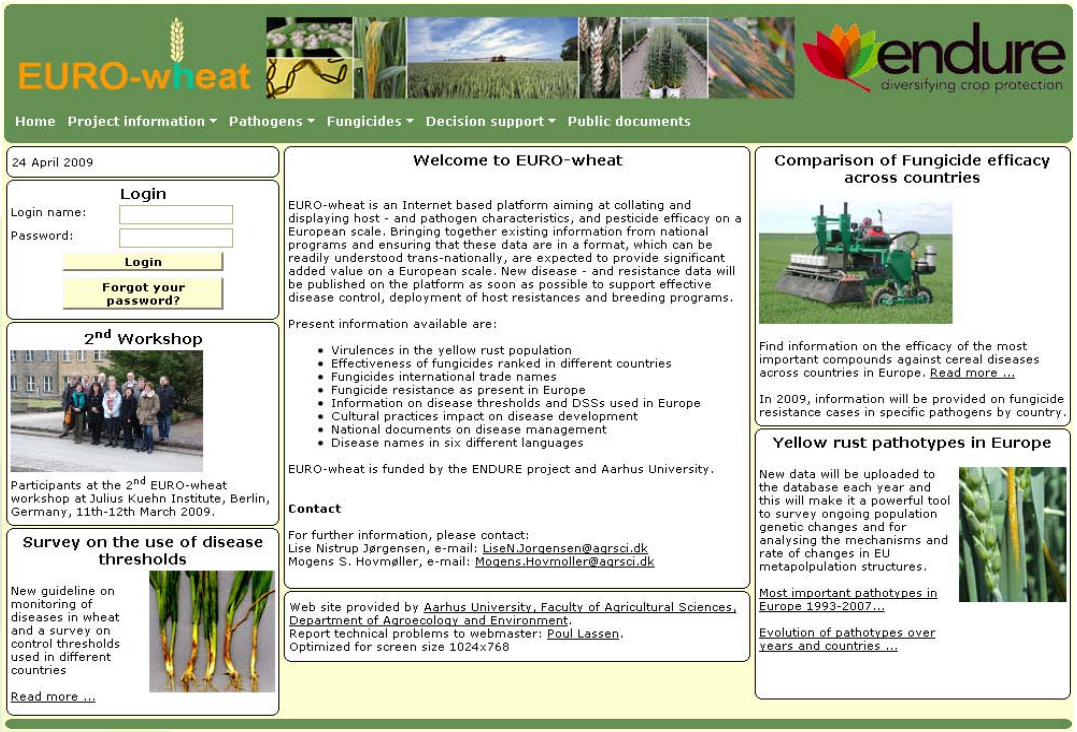
- **Virtual Laboratory** http://vl.endure-network.eu/v4/
- **Platforms**
  - Weed Traits Database
  - EuResist
  - EuroWheat

EuroWheat platform

- The EuroWheat platform **http://www.eurowheat.org**

- Informationen about
  - Fungal diseases
  - Resistance management
  - Control thresholds
  - Decision support systems

- Target group
  - Scientists
  - Advisors



EuroWheat content

EuroWheat

Home | Project information | Pathogens | Fungicides | Cultivars | Decision support | Public documents | Links | Data collection

Ranking of wheat cultivars for susceptibility to Fusarium

Select to change information in the right hand info box

- Most resistant cultivars
- Medium susceptible cultivars
- Most susceptible cultivars

Fusarium resistance - Components and ways of measuring the feature

Resistance of wheat to Fusarium head blight is a complex trait. Five resistance components have been characterized. Type I and Type II are the most common ways of measuring Fusarium resistance.

Type I: Resistance to initial infection. Assessed using spray inoculation of heads with *Fusarium* spores or spreading *Fusarium* infected debris (or grain) on the soil and evaluating of number of infected spikes.

Type II: Resistance to spread of *Fusarium* fungus within the spike. Assessed by point inoculation of a middle spikelet in the head and evaluating of extent of symptoms spread from inoculation point. Inoculation methods for type I are also widely applied.

Type III: Resistance to mycotoxins (deoxynivalenol, nivalenol) i.e. nonaccumulation or ability to degrade (or inactivate) mycotoxins. Evaluated by analysis of mycotoxin amount in grain using ELISA tests or chromatographic techniques.

Type IV: Resistance to kernel infection. Assessed by counting of proportion of kernels visibly damaged by Fusarium or analysis of ergosterol amount in grain or *Fusarium* DNA quantity in grain.

Type V: Tolerance to *Fusarium* i.e. tolerant cultivars has lower yield loss than intolerant at the same FHB severity level.

Different testing methods

The screening for susceptibility to *Fusarium* is done differently depending on the country

Country	Metode used for ranking
Denmark	A mixture of spores of *Fusarium culmorun* and *Fusarium gramineirum* is applied 2-3 times during flowering with a densitiy of 10-x 106 spores pr ml. The degree of flowering is assessed for each variety at the time of inoculation.
Germany	**For official ranking:**Carrying out maize stubbles / residues of corn or silage maize in December with a density of 6-8 pieces per m²; **For selection of entries:**Spray inoculation of conidia with a mixture of *Fusarium culmorum* / *Fusarium graminearum* 3-4 times during flowering with a density of 100.000 conidia / ml
Poland	Mixture of *F. culmorum* isolates is applied 2-3 times during flowering by spraying of heads with a spore suspension of density 5 x 105 pr ml.
France	Maize stubbles are spread out on the plots in December. Plots are daily watered by using sprinkler from 15 days before flowering up to 30 days after flowering.
UK	An equal mix of *F. culmorum* and *F. graminearum* spores at 2.5x105 spore ml-1 are spray inoculated onto the ears. The varieties are sown in three beds (with 3 reps in each bed) and the date when each variety flowers is noted. The beds are inoculated at three time points; early, mid and late. Each bed receives one spray inoculation. Only varieties that are in flower when the bed is inoculated are included in the data analysis.

List of cultivars in selected countries

Most resistant cultivars

Skalmeje, Asano, Naturastar, Olivin, Skagen, Petrus (resistant standard cultivar)

Panorama, Ketchum, Claire, Istabraq

Apache, Graindor, Galibier, Hymack, Ephoros, Hysun

Akratos; Astardo, Aszita, Atlantis, Batis, Bussard, Butaro, Discus, Enorm, Esket, Hermann, Impression, Lahertis, Lucius, Magister, Meteor, Mythos, Naturastar, Pamier, Petrus, Skalmeje, Sobi, Sokrates, Solitär, SW Maxi, Toras

Anthus, Dorota, Finezja, Fregata, Hermann*, Legenda, Mewa, Muza, Nutka, Olivin, Petrus*, Skalmeje*, Smuga, Solitär*, Turnia, TonacjaEnorm*

Sources:
Mesterhazy A. 1995. Types and components of resistance to Fusarium head blight of wheat. Plant Breeding 114: 377-386.
Mesterhazy A. Bartok T., Mirocha C.G., Komoroczy R. 1999. Nature of wheat resistance to Fusarium head blight and the role of deoxynivalenol for breeding. Plant Breeding 118: 97-110.
Miedaner T. 1997. Breeding wheat and rye for resistance to Fusarium diseases. Plant Breeding 116: 201-220.
Miller J.D., Young J.C., Sampson D.R. 1985. Deoxynivalenol and FHB resistance in spring cereals. Phytopath Z.113: 248-256.
Schroeder H.W., Christensen J.J. 1963. Factors affecting resistance of wheat to scab caused by Gibberella zeae. Phytopathology 53: 831-838.

- Fungicides efficacy, resistance, tradenames
- Yellow rust pathotypes, distribution across years and countries
- Fusarium risk and cultivar ranking

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EuroWheat IPM element

EuroWheat

Home | Project information | Pathogens | Fungicides | Cultivars | Decision support | Public documents | Links | Data collection

Cultural Practices

Help

Non-chemical control of wheat diseases

Select to change information in the right hand info box

- Eyespot
- Yellow rust
- Brown rust
- Powdery mildew
- Septoria leaf blotch
- Tan spot
- Fusarium species
- Take-all

Integrated pest management (IPM) are closely linked to adaptation of cultural methods. This practise is often regarded as a sustainable and more enviromentally friendly method. Application of IPM can help to minimize the need for application of fungicides. IPM principles have been defined and promoted by several organisation like IOBC and FAO.

In relation to minimizing disease risk the following elements are known to be of major importance:

- Diversification of crop rotations.
- Use of resistant cultivars and/or variety mixture.
- Removal of debris.
- Reduced use of nitrogen.
- Optimal sowing conditions and timing.

Important links

HGCA:
The Encyclopaedia of Cereal Diseases

Wheat Disease Encyclopaedia

References

To find references indicated in the hard brackets, please select the Help Icon in upper right corner.

Cultural practices impact on disease development

Fusarium Head Blight (Fusarium spp)
HGCA photos

Resistance genes	Varieties with good resistance are known, and may help to reduce disease levels. Several non-specific genes are used and described e.g. Fhb1 from Chinese spring wheat. Different types of resistance are described: Resistance to initial infection (type I), resistance to pathogen (type II), ability to degrade mycotoxins (type III and IV), or resistance to grain infection (type V). Tall cultivars are often seen to be less susceptible (longer distance for inoculum to spread). Compact heads are known to increase the risk of attack. Open flowering increase the risk of infection. [1,7,8,22,32,36,41]
Previous cropFrequency in rotation	Maize as previous crop has been found to increase the risk of fusarium head blight. Wheat has also been found to potentially increase the risk in some regions. [14,36]
Sowing date	Not found to be of specific importance
Tillage	Ploughing decreases the risk by removing inoculum. Minimal tillage significantly increases the risk when wheat follows maize or wheat. [3,31]
Debris	Crop debris on the surface increases the risk of disease development. [3,27,36,39,42]
Nitrogen amounts	Literature describes the risk to increase following high N -levels. Practical importance unclear. [10,21,29]
Nitrogen strategy	No information available.
Crop densityRow spacing	No information available.
Landscape	No information available.
Soil type	No information available.
Weather	Wet and humid conditions during heading and flowering stimulate attack (GS 51-69). [36,42]

New text will come

- Control thresholds used in different countries
- Cultural practices impact on disease development

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ENDURE
Tools for extension

- ENDURE Information Centre
  http://eic.endure-network.eu:8080/webui/search.xhtml

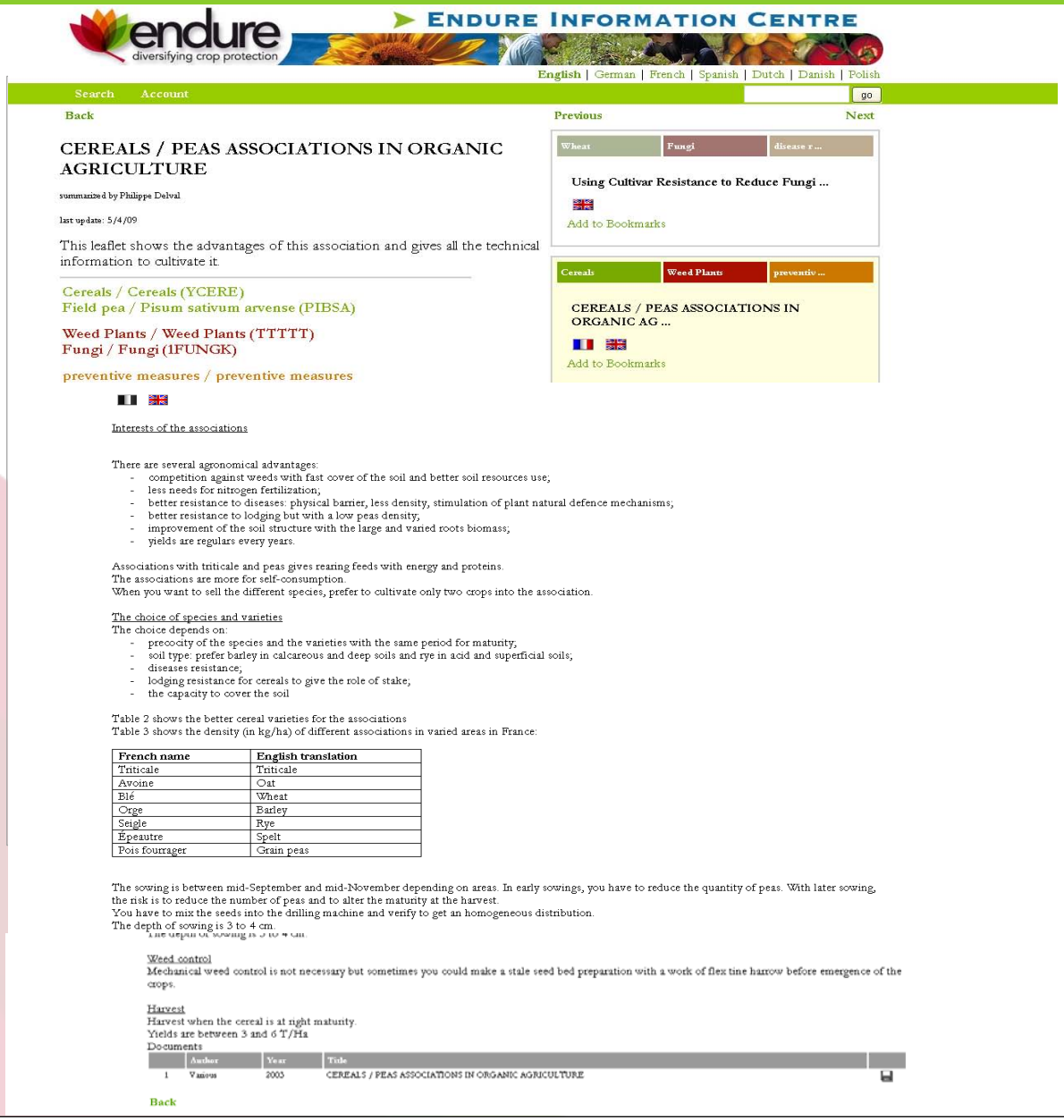
- Target group
  advisors,
  extension service

ENDURE Information Centre

- Extending expert knowledge, recommendations on IPM and non chemical alternatives in Europe
- Linking between crop protection advisors and researchers in Europe
- Research delivers content to extension and farmers

  aiming to result in less input and less dependency on chemical inputs
- Sources: Endure and national sources

EIC Search



- Search

  crop–pest/disease–combination and region

- Results

  best available IPM practices

  across different regions

  in Europe

Scientific support to policies

- **Facilitating exchange across EU**
- **Creating a dialogue between policy makers and researchers**

European policy seminar

SUSTAINABLE AGRICULTURE AND PESTICIDES: What is at stake? What are the options?

"The Role of Governance and Actor Networks in Mainstreaming IPM"

PARIS
25 - 26 November 2008

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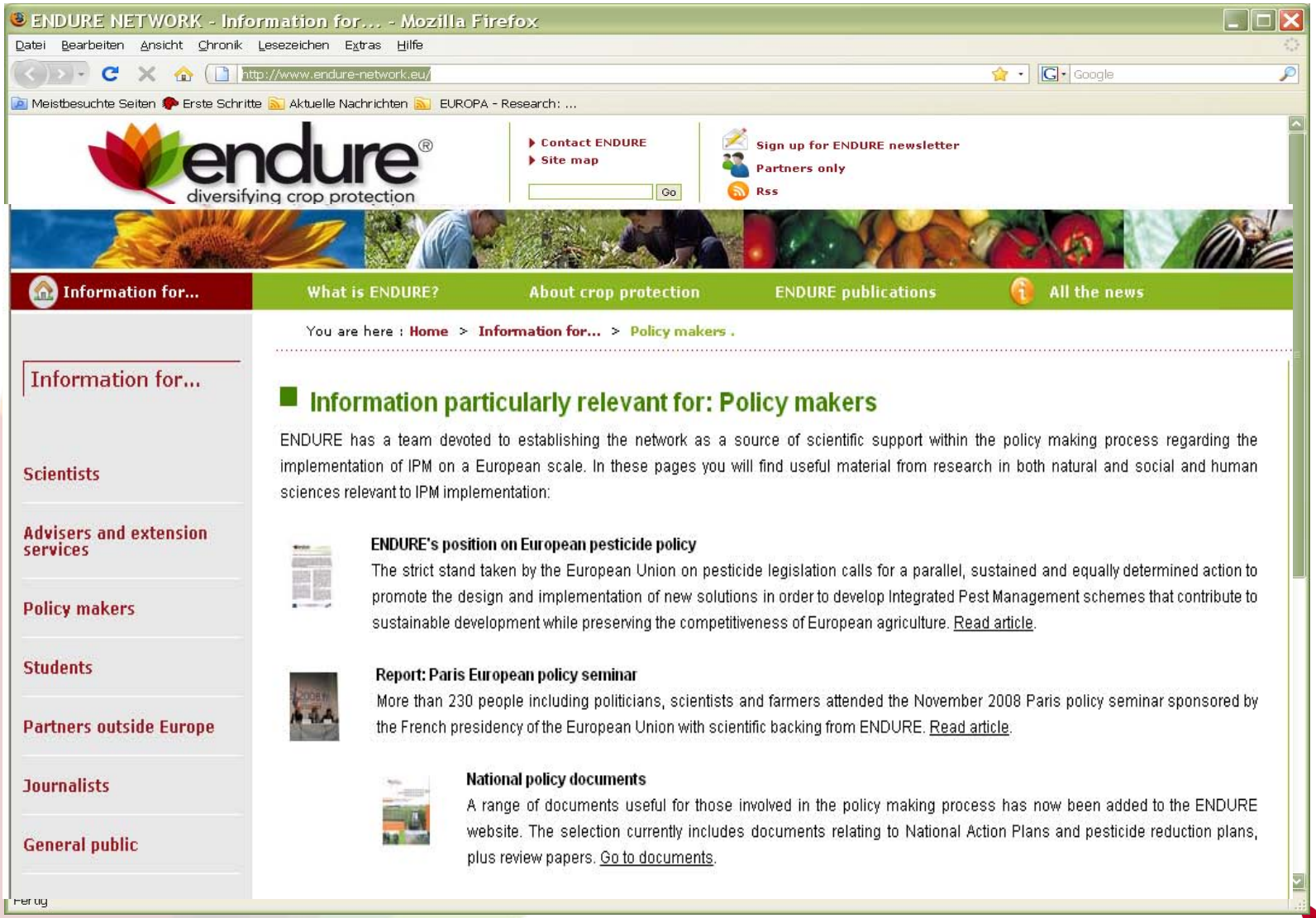
ENDURE Website

- Website **http://www.endure-network.eu/**



Thank you for your attention.

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