



ENDURE

European Network for Durable Exploitation of crop protection strategies

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Prototype of Eurowheat with at least two wheat pathosystems operational

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Dissemination Level	
PU Public	X
PP Restricted to other programme participants (including the Commission Services)	
RE Restricted to a group specified by the consortium (including the Commission Services)	
CO Confidential, only for members of the consortium (including the Commission Services)	

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Glossary

HGCA: Home Grown Cereal Authority
DSS: Decision support systems

Summary

A first version of EURO-Wheat, which is an Internet-based platform accessible through VL, has been created during the first 12 month of the 2nd JPA (www.eurowheat.org). The EUROBLIGHT platform on potato late blight developed by Aarhus University has served as useful inspiration to the platform, <http://www.euroblight.net/EuroBlight.asp>. The vision is to facilitate a platform containing the most important information about wheat disease management in an IPM context. Information can be accessed in different ways, e.g. through a specific PATHOSYSTEM, through a host CULTIVAR, through DSS and THRESHOLDS or through a FUNGICIDE. The platform is an integrated platform in the virtual lab.

7 partners and 5 countries have been taking part in the activity. The group had a workshop at Flakkebjerg, DK in spring 2008. At this workshop the framework for the activity was defined. During the rest of the year the partners have exchanged information or met at different events (Grand Motte, Extension meetings etc).

EURO-Wheat includes today:

- 1) Information on pathotypes and virulence of yellow rust using data from 3 countries including an interactive analysis tool.
- 2) Information on fungicide efficacy on 6 diseases has been collected from 5 countries - including an interactive tool for designing a table with selected data (one or more countries, and, one or more diseases and, groups or selected fungicides)
- 3) Existing DSSs dealing with wheat diseases have been described briefly including links to the original systems
- 4) Information on disease monitoring and control thresholds developed in 6 countries has been shared and can be compared in a searchable manner.
- 5) Information on available reports from Endure (wheat case study) and different national brochures can be downloaded from the platform. The platform also contains links to an encyclopaedia of cereal diseases.

The group is in the process of collecting further information on varieties including disease ranking and fungicide responses. Also information on Fusarium species present on the grain as well as cultivar susceptibility to Fusarium is under preparation.

The present information in EURO-Wheat is to some extent based on information collected in the first 12M of the wheat case study as well as previous European networks such as COST817 and the existing FP6 project BIOEXPLOIT (<http://www.bioexploit.net/>).

The goal is to combine existing and new information about IPM-based disease control in wheat, which is the most important arable crop in Europe. We believe that EURO-Wheat will provide significant and immediate added value for European agriculture.

Definitions

The screenshot shows the EURO-wheat website with the following content:

- Header:** EURO-wheat logo and navigation menu: Home, Participants, Pathogens, Fungicides, Cultivars, DSS, Events, My profile, Upload/download, Public documents, Links.
- Left Column:**
 - Date: 23 January 2009. Welcome Lise Nistrup Jørgensen (LNI).
 - Logout button.
 - Kick-Off Workshop:** Photo of participants at a workshop. Text: "Participants at the EURO-wheat workshop at Research Centre Flakkebjerg, University of Aarhus, Denmark, 14th-16th May 2008."
 - Survey on the use of disease thresholds:** Text: "New guideline on monitoring of diseases in wheat and a survey on control." Includes a small image of wheat.
- Center Column:**
 - Welcome to EURO-wheat:** Text: "EURO-wheat is an Internet based platform aiming at collating and displaying host - and pathogen characteristics, and pesticide efficacy on a European scale. Bringing together existing information from national programs and ensuring that these data are in a format, which can be readily understood trans-nationally, are expected to provide significant added value on a European scale. New disease - and resistance data will be published on the platform as soon as possible to support effective disease control, deployment of host resistances and breeding programs. Present information available are:
 - Virulences in the yellow rust population
 - Effectiveness of fungicides ranked in different countries
 - Information on disease thresholds and DSSs used in Europe
 - National documents on disease management
 EURO-wheat is funded by the ENDURE project and Aarhus University.

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- Right Column:**
 - Comparison of Fungicide efficacy across countries:** Includes a photo of a tractor in a field. Text: "Find information on the efficacy of the most important compounds against cereal diseases across countries in Europe. [Read more...](#)"
 - Yellow rust pathotypes in Europe:** Includes a photo of wheat with rust. Text: "New data will be uploaded to the database each year and this will make it a powerful tool to survey ongoing population genetic changes and for analysing the mechanisms and rate of changes in EU metapopulation structures."

1. Creating the platform

1.1. Technical issues

The Eurowheat research platform (www.eurowheat.org) consists of a MS SQL database server and a MS Web server, hosted by University of Aarhus. The disease and fungicide efficacy data are stored in one big relational database in same format as data for potato late blight that relates to a similar research platform, Euroblight (www.euroblight.net). For Eurowheat key words are sustainability and added value i.e. the database can easily be expanded with more diseases and more fungicides. Applications developed for potato late blight can immediately be used for wheat when relevant and vice versa. Data are harmonised and national data can be analysed in a pan-European context. This will stimulate partners continuously to upload new data. The system is prepared to provide results in different language as this might be an important barrier for dissemination to advisors and farmers. Relevant results and applications can be integrated and disseminated via the Virtual lab i.e. information from Endure are collated and disseminated on a few dedicated web sites.

1.2. Development of features on the platform

The specialists and key persons from the activity interact closely with the system development group to ensure access to and compatibility with formats of national data, e.g. pathogen virulence, pathogen resistance to fungicides, host plant resistance and/or pesticide efficacy as well as the technical formats of other VL activities. This should ensure sustainability throughout ENDURE and in the years thereafter.

1.3. Updating information

Several of the features on the platform need to be updated yearly in order be valid to the public. This is e.g. the case for fungicide efficacy and virulence data. Each partner needs therefore to dedicate persons who are prepared to help with the yearly update. In most cases the information needs to be updated at the national level yearly anyway and therefore the effort to provide the information to the platform should only be a minor issue.

The database relies to a great extent on already existing networks, which meet regularly.

1.4. Other elements

Further, partners outside ENDURE will be invited to add information to the platform (e.g. from Sweden, Austria, Switzerland, The Czech Republic) in order to reach a broader end-user audience. National organizations (extension etc.) have been and will also in the future be invited to give feedback on the usefulness of the platform and to suggest improvements and priorities for new developments.

2. Content on platform

Inspired by the experiences, which potato-blight people have achieved from the Eucablight platform and the results from the wheat case study, it was decided to propose and develop a platform for wheat diseases. More precisely the discussion at the first workshop led to the final decisions on which issues we initially should include on the platform.

2.1. Introduction information

The front page of the web page aims at giving a quick overview of the content of the platform. All partners and persons involved in creating the platform are presented in order to understand who is contributing and responsible for the activity.

2.2. Information on pathosystems

At present the section contains only information about yellow rust. In order to be able to give an updated situation on the development of pathotypes of yellow rust, which can potentially attack cultivars, the page provides information on the findings from different countries.

Data on different pathotypes of yellow rust from 1993-2007 is presented for 3 countries. The data can be selected for specific countries and years and the ranked frequencies of pathotypes, number of different pathotypes etc. are shown in graphics. Indications on the pathotypes potential for attacking specific key varieties are also included

It is a wish to include information on other diseases. At present the group works on collecting information about Fusarium.

It is hoped that more general information on mildew, septoria and brown rust will also be made available when time permits.

2.3. Information on fungicides

One section on the platform deals with fungicides. Many countries have a national ranking of the fungicides' efficacy based on national testing of the products' performance. The different countries use either star-rating or colours to illustrate the level of efficacy. The system varies from 3-5 star systems and therefore the information can not directly be translated from one system to the other. The following ratings have been decided for the categories.

- White: Not registered
- Red: Problems with resistance
- Light green: Low efficacy
- Medium green: Moderate efficacy
- Dark green: Good efficacy

Efficacy is characterized for 6 diseases

Powdery mildew, Septoria leaf blotch, Yellow rust, Brown rust, Tan spot, Eyespot
Fusarium head blight

Fungicides have been divided into 4 groups: triazoles, strobilurins, others, mixtures.
So far data have been provided from UK, DK, F, DE, NL, S,

It is possible to select specific information among diseases, countries and fungicide groups.

A special section under fungicides deals with fungicide resistance. This includes national information on resistance situations and recommendations as well as a links to web pages dealing with fungicide resistance.

2.4. Information on varieties

This part is not developed yet, but information is currently being collected in order to share information on cultivar susceptibility to relevant diseases, known resistance genes as well as responses to fungicides.

2.5. Information on DSS and thresholds

Based on information from other ENDURE activities dealing with DSS, all systems dealing with disease management in wheat have been extracted and described briefly. Links to contact persons are given along with direct web links. At present 7 links are included.

Another section deals with monitoring and assessments for diseases. It is described how monitoring should be done for specific diseases including information on specific control thresholds for 6 diseases: Powdery mildew, Yellow rust, Brown rust, Eyespot, Septoria leaf blotch, Tan spot.

Thresholds from 6 different countries are uploaded.

The aim is to extend this part with descriptions of how the risk of diseases can be reduced using alternative, non-chemical means of control. This activity will be developed in collaboration with the system case study for arable winter crops, which focus on how risk can be minimized using a system approach.

2.6. Information on public documents

This part contains relevant documents on disease management in wheat. Papers originate from national programme. At present there is a dominance of information coming from UK. HGCA has a major production of leaflets to UK farmers and much of this information, since it is written in English, is also easily accessible to other countries.

All relevant papers produced within ENDURE on wheat disease can also be linked to from this part.

3. Users of the platform

The platform aims at being a place where advisors and scientists around Europe can exchange information on disease management in wheat. Extension services from DK and France are involved in the project and expected to contribute with proposals to stimulate a user friendly version of the platform.

At the moment most elements are publicly accessible on the platform.

Parts which are still under development are only available to a close audience.

4. Future activities

This project will continue under JPA3 and the project plans to have the next workshop in March. At this meeting the present content will be evaluated and new elements will be discussed and structured for the next period.