June 2012

"Welcome to the first annual newsletter of the PURE project. We selected the elements of the first project's progress in the best interest of stakeholders. We wish you a pleasant reading and hope that you will share this newsletter with colleagues."

Françoise Lescourret
INRA (France), PURE Coordinator

The overall objective of PURE is to provide practical IPM solutions to reduce dependence on pesticides in selected major farming systems in Europe. The PURE project began in March 2011 in Avignon (France). PURE involves a diversity of researchers and relevant key actors in pest management: farmers, farm advisers, policy advisers, and other stakeholders in the food supply chain. It brings together 24 partners from research, industry, extension and education covering 11 European countries. It is coordinated by INRA (National Institute for Agricultural Research, France).

More details and information regarding the project can be found on the PURE website and in the PURE brochure.

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In this first annual newsletter, we introduce work performed during the first year in the different activities of the project (Cropping systems, Dissemination, Co-innovation). You can find more information on the project website just following the links.

Pesticide Use and Risk Reduction for future IPM in Europe

Pure 1st Congress in 2013

Registration will open on August 15th 2012

The main objective of this congress, that will be held at Riva del Garda from March 19th to 21st, 2013, is to promote knowledge exchange among the different actors, scientists, companies, farmers, advisors, policy makers and supply chain stakeholders, and identify approaches, tools and techniques to meet the future needs of European crop protection.

You can find more details on the ***Project section of the PURE website*** in related file first_circular_final and on the specific Congress website **www.futureIPM.eu.**

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Riva del Garda MICE

Wheat cropping system

In total, six long-term, on-station experiments are being conducted to test IPM solutions in wheat. The experiments are located in Denmark, France (2 experiments), Germany, Poland and Scotland. Four of the six experiments (Denmark, Germany, Poland and Scotland) began in the autumn of 2011 adopting the same general lay-out while the remaining two experiments (France) are continuations of existing long-term experiments.
In all experiments scientists are comparing current practice to two levels of IPM practice: intermediate* and advanced** IPM. The current practice reflects what is considered to be good agricultural practice in the corresponding countries. In the intermediate IPM practice we make use of knowledge and techniques proven to reduce the reliance on pesticides but not widely used in practice (e.g. more diverse crop rotation, resistant cultivars, mechanical weed control) while the advanced IPM practice, besides putting more emphasis on the non-chemical techniques used in intermediate IPM, also seeks to include novel technologies.

** Intermediate IPM is characterised by focusing on the pests individually employing a mix of preventive and control methods to optimise control and minimise risks through a significant reduction in pesticide use and giving preference to selective pesticides where pesticides are still required.*
*** Advanced IPM represents a very innovative level of IPM making use of all tools that can reduce the dependence on pesticide employing a more diversified crop rotation.*

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For more information:
http://www.pure-ipm.eu/publication/27
IPM strategies to be examined in the first year of on-station and on-farm experimentation

Maize cropping systems

Mechanical weed control experiment

To reduce the use of pesticides, crop protection in European maize agriculture should adopt a cropping system approach that considers the cropping sequence and crop protection practices against all important pests, weeds and diseases in the system. The agronomic feasibility as well as the environmental, economic and social sustainability of the innovative systems should be evaluated. Information on critical pests as well as on innovative IPM tools has already been made available for four EU regions (Italy, Spain, Hungary and Denmark/Netherlands) by the ENDURE Maize-based Cropping Systems group (Vasileiadis et al., 2011) and has been updated with information from Germany and Slovenia during the first year of the PURE project.
The PURE activity on maize focuses on southern grain maize systems. The experimental framework is similar to that adopted by the other arable crop (i.e. wheat). Three long-term on-station experiments, each comparing three levels of IPM, have been set up in Italy, Hungary and France. Another smaller on-station experiment dealing with non-chemical weed control tools is being conducted in The Netherlands.

Sesamia borer

Pheromone trap test for Sesamia

In addition, three on-station experiments (in Italy, Germany and Slovenia) investigating the effects of different herbicide treatments sprayed at three different doses on weed biomass are being conducted. These will provide data for the construction of a Decision Support System (DSS) for weed control in maize.
On-farm trials are also being conducted in five countries (Slovenia, Italy, France, Germany and Hungary) to test IPM solutions under real field conditions. IPM tools are tested in 15 experiments against the normal farm procedures (conventional). All protocols and several detailed operative procedures have been agreed and were implemented during the experimental season.

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For more information:
http://www.pure-ipm.eu/publication/28
Updated list of critical pests and innovative IPM tools and solutions in maize grain systems following ENDURE

Vegetable cropping system

Cutworm attack on Chinese cabbage.

The IPM solutions (Biocontrol agents against cabbage root fly, aphids, caterpillars) to be tested as on-station experiments in 2012 was then finalised.
For weed control, a completely herbicide free alternative will be tested which uses a different kind of modern mechanical intra-row weeders including a robotic one.

During the first year of the PURE project a wide range of possible IPM solutions for cruciferous vegetable crops were discussed.
The proposed IPM tools to be tested (intelligent and non-intelligent weed control equipment, DSS for foliar disease control) were evaluated particularly with regard to their potential for pesticide use reduction, the ease of implementation in practise, as well as the associated costs and benefits.

Cabbage aphid infestation of white cabbage

To control three key pests (cabbage root fly, aphids and caterpillars) entomopathogenic nematodes, bacteria and fungi, as well as actions thresholds in combination with selective pesticides, and the impact of trap crops were the IPM tools selected for testing in the first on-station experiments. The on-station trials will be run in 2012 in different European countries: Denmark, France, Germany, Netherland, Scotland and Slovenia.

Field visit and discussion with cabbage grower at Marne (Germany).

Robovator weeder
(http://www.kress-landtechnik.de/)

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For more information:
http://www.pure-ipm.eu/publication/29
First selection of the IPM solutions to be tested on-station

Pome fruit cropping system

Future pest strategies must match the demands of lower environmental and health risk for workers and economically sustainable fruit productivity and quality. The solution is keeping the frequency and dose of chemical pesticide application at a low level by:
i) precision farming in space and most of all in time using decision support systems (DSS),
ii)replacing chemical pesticides by more ecologically benign and biological control with natural enemies,
iii) reducing the pest pressure with cultural methods as sanitation and
iv) making the crop less susceptible to the pest with cultural methods that strengthen their robustness and the choice of the resistant or tolerant cultivars.

Apple scab (B.Heijne – DLO)

A comprehensive overview on IPM tools with a focus on their practical application is available on the website. However, further tools are required and the individual tools have to be combined in "toolboxes" with strategies for optimizing IPM. The first objectives were to collate both the existing and innovative non-chemical tools for key pests and diseases of pomefruit and to give a brief overview of the major pests in apple and pear orchards for the five European regions in the context of their climatic and common cultivation conditions.

A report was produced which can be used as a guide within the frame of the PURE project for the identification of innovative IPM tools and for assembling IPM solutions for pest control in pomefruit, i.e. developing for each key pest and region specific toolboxes, consisting of a set of complementary, promising tools and strategies for pest management. In order to achieve this aim and to ease the data collation a database was developed.
In a later step the database will be linked to assessment tools for ecological and economical evaluation of the various defined pest strategies.

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For more information:

http://www.pure-ipm.eu/publication/30
Descriptions of most important innovative non-chemical methods to control pests in apple and pear orchards

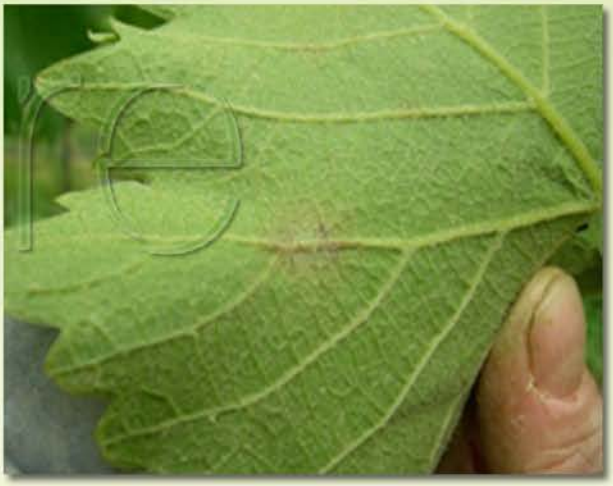
Fireblight (G.Bantleon)

Grapevine cropping system

Botrytis cinerea on bunches. (Photo: Gessler, ETH)

The first objective was to assess the relative importance of the most critical grapevine pest and pathogen problems in the different areas studied in the project. For this, four study areas, representative of the most relevant grape growing areas in Europe were selected and were addressed by the corresponding partners: Atlantic (Western France, ACTA, INRA), continental - North of the Alps (Northern France INRA, ACTA and Germany, JKI), continental-like - South of the Alps (Northern Italy, FEM) and Mediterranean (Southern France, INRA; Central Italy, CNR).

In each study area, a typology of farming systems was established and the relative importance of the most critical grapevine pest problems in each was assessed by the use of questionnaires, interviews, focus groups and already available statistics depending on the specific situation.
You can see the results on all the diagrams in Annex 1 of the document ***Assessment of the relative weights of the most critical grapevine pest problems.***



Powdery mildew infections (Photo: Pertot, FEM)

More information and details regarding Grapevine on-station and on-farm experiments implemented in 2011 are given in the document ***IPM solutions tested in experimental station and compared to the conventional strategy and referred to an untreated control plot and in farms*** (available on PURE website).

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For more information:
http://www.pure-ipm.eu/publication/31

Protected crops cropping system

Six complementary, on-station experiments are being carried out. The general objective is to assess direct performance and side-effects of IPM packages in greenhouse experimental conditions and to optimize the potential levers provided by greenhouse technology.
The expected outcomes are:
• Stable, efficient and complementary Bio Control Agents associations targeted to multi-pest control issues.
• Knowledge on synergistic properties and/or incompatibilities among IPM tools.
• Defining scenarios allowing the highest efficacy of pest control.

Tomato damaged by Tuta absoluta

The selection of trial locations results from a combination of local team know-how, experimental facilities, and pest presence in the area: INRA-Sophia and INRA-Alénya (France), WUR-Wageningen (The Netherlands), CNR-Naples (Italy), IVIA-Valencia (Spain).

Tuta absoluta pheromone trap (Photo: IVIA)

• INRA Sophia evaluates the impact of the new greenhouse technologies on biological control and implements new levers to enhance pest and disease control. Energy-saving innovations and climate control optimization are the major focuses.
• INRA Alenya assesses the impact of innovative fertilization and climate management on pest and disease dynamics.
• CNR Naples focuses on the performance and side effects of new ***Trichoderma strains.***
• IVIA Valencia develops innovative biological control methods against ***Tuta absoluta*** and studies the impact of endemic natural enemies on the different biotic components.
• WUR Wageningen focuses on the latest emerging pest to occur on tomato crops, tomato russet mite, and its potential indirect effect on whitefly control.

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Dissemination

Within the PURE project, farm field visits will be organised. These farm days will be held in each country participating in PURE to enable farmers, extension services, researchers and stakeholders involved in PURE to share the skills, information and knowledge with neighbouring (non-participating) farmers and other stakeholders. The farm days will transfer to farmers and extension services the innovative IPM solutions and tactics designed by PURE partners. Farm field days will be the opportunity to develop participatory training.

A first document, called ***Farm field visit training methodology,*** was produced and aims at presenting the concept of farm field visit training. This report includes a common approach on the content, organisation and methodology needed to perform farm field visits, including necessary preparations and learning skills.

Farm days and field visits will act as the main tools for dissemination of PURE outputs among farmer and extension communities in each country.

A well prepared farm field visit will ensure that knowledge, skills and drive of the stakeholders are taken full advantage of by participation and strategic interventions. This will in turn result in a strong dissemination and better uptake of integrated farming practices by the participating stakeholders, particularly the end users. By following the methodology described in this deliverable, the trainers will be able to:

- Train farmers, extension services, advisors and scientists in advanced approaches and tools derived from the project.
- Receive input from the field visitors upon the feasibility of the proposed IPM measures
- Provide the opportunity for questioning by the IPM end user

Farm visits should be organised with participatory methodology and take stock of the pilot processes managing co-innovation. In this respect, the activity links well with Co-innovation activity.

The three pictures illustrate growth aspects of oilseed rape, pheromone traps for monitoring orange wheat blossom midge, and sublethal effects of a herbicide mixture in poorly established spring barley. Image source: Jens Erik Jensen, VFL.

To follow it, a second deliverable, called ***Virtual field visit route,*** provides the members of the PURE workpackages with the necessary information to be able to build the virtual field visits. Besides templates for basic general information about the experiments and instructions for upload of materials, there is also information on how to ensure relevant information is gathered from the experiment. There are suggestions for a visit strategy for each cropping system. Tips and suggestions are also given in relation to getting the most out of the visual tools like photos and videos, but also to the use of interviews.

The goal of this deliverable is to be able to provide the visitors of the virtual field visits with enough information (text, photos and video) for them to understand the experiment, without actually visiting the field. In this way, the virtual field visits will be valuable for building of local trainings and workshops in relation to PURE and Integrated Pest Management (IPM).

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For more information:
http://www.pure-ipm.eu/publication/2

Farm field visit training methodology
Virtual field visit route

To find future virtual visits:
http://www.pure-ipm.eu/virtualvisit/2

Co-innovation

The development of sustainable agriculture could be characterised as a multi-stakeholder process. The conventional approach is widespread in Europe and is also part of the PURE approach: IPM practices are developed, tested on experimental farms and disseminated by farmer field days and a website. A participatory approach which has been widely successful in developing countries is also proposed. This participatory approach has to be developed within the Co-innovation activity, applied to the reduction of pesticide dependency of European farming systems.

The PURE Co-innovation workgroup produced a document called Co-innovation at work: The concept and its application in PURE describing how Co-innovation activity in the first year of PURE.
A first version of Co-innovation training manual is also available on the PURE website. The training is part of the PURE project. The co-innovation idea is different from this linear approach: it connects the end of the line with the beginning, taking into account the potential users and their situation before starting with design, testing and improving. This should lead to a better solution, but also to a higher commitment of the users for application.

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For more information:
http://www.pure-ipm.eu/publication/3

Co-innovation at work: The concept and its application in PURE
Co-innovation of IPM: Training manual

Links between PURE and ENDURE

PURE takes research work initiated in ENDURE one step further. PURE focuses on the systems approach started by ENDURE, examining the role of larger spatial (cropping system) and temporal (multi-year) scales in crop protection.
PURE will develop field-tested practical solutions, new knowledge and a research toolbox for more sustainable approaches to crop protection.
ENDURE supported the creation of a Seventh Framework Programme (FP7) topic on IPM research at the farming systems level and is collaborating with PURE to communicate its results.
ENDURE is also monitoring the non-technical barriers identified through PURE's work with stakeholders and is raising these issues in the appropriate forums.

For example, although diversifying rotations is known to be an essential lever to create more robust cropping systems, the new crops introduced in the rotation require new know-how, incentives or markets. Similarly, resistant grape varieties exist but cannot always be used due to old legislation originally designed to protect wine quality.
The IPM solutions emerging from PURE will need to be used within an innovation process through which farmers work closely with advisers to adopt, fine-tune and adjust new practices. Advisers naturally play a key role in this process and ENDURE is currently developing initiatives to strengthen the role of advisers in promoting IPM.

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For more information into the PURE website and on the ENDURE website

Do not forget, you can find all upcoming events and news from the PURE project on the home page.