

## Managing potential diffuse sources of surface water contamination

Advancing Intelligent Mitigation  
project team  
on behalf of ECPA



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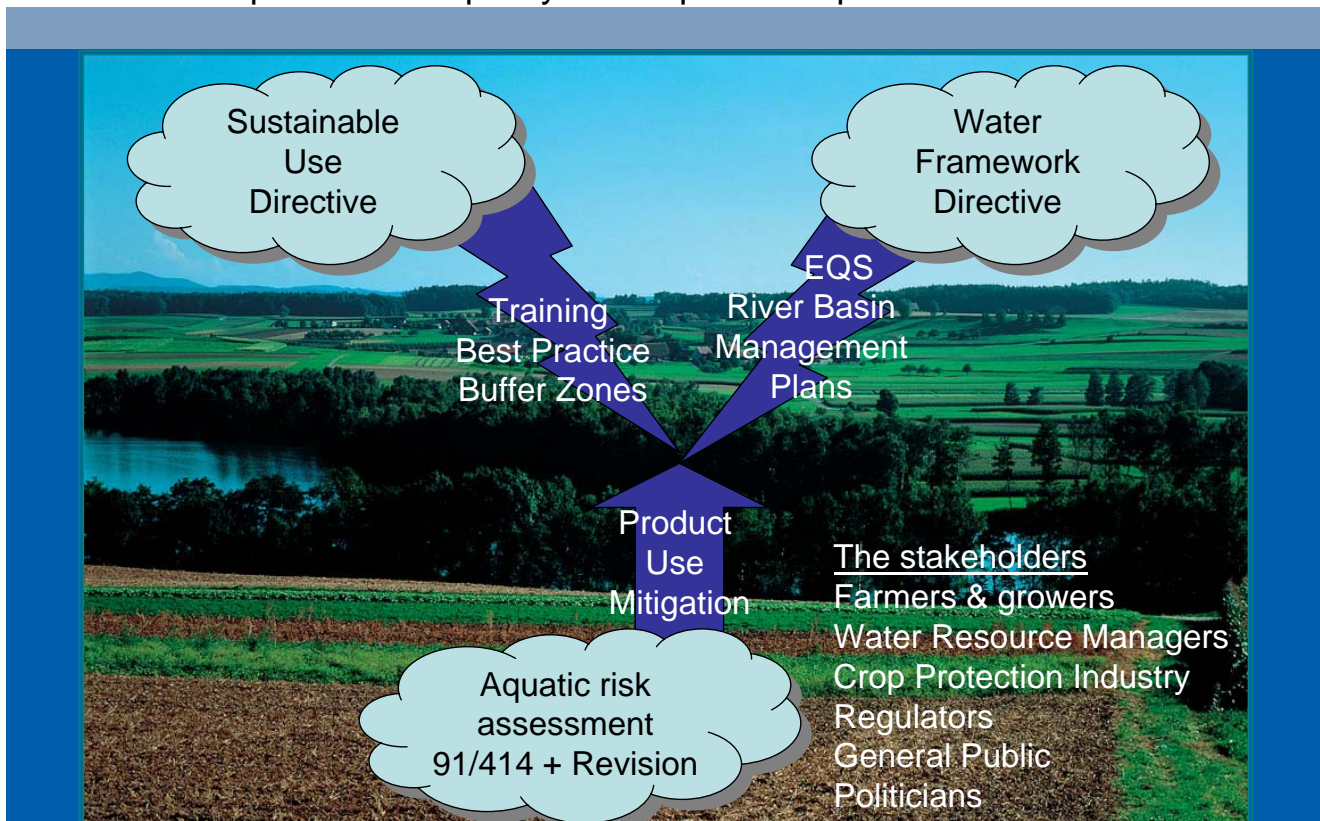
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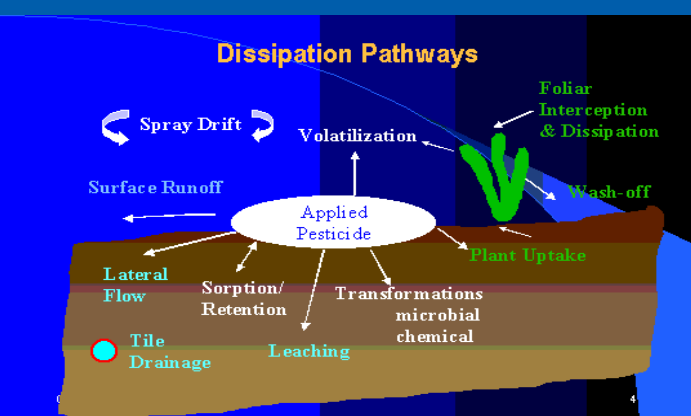
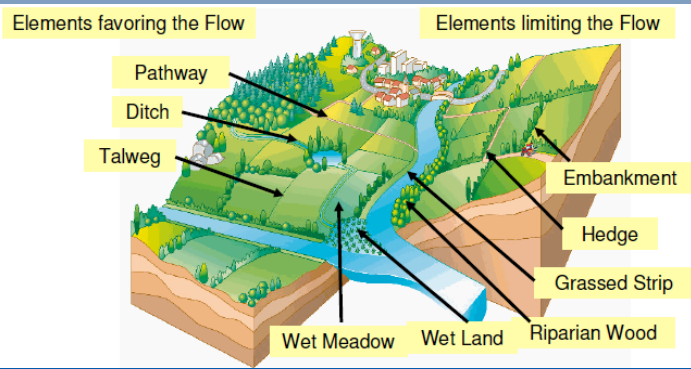
# Presentation Outline

- The need for action
- A multi-stakeholder approach
- Status of current activities
- Next steps

**A need for action:** Three different EU legislations influence activities to improve water quality and impact multiple stakeholders



# Key stakeholders bring different knowledge, opinions and needs to the table



# ..and contribute to the management of water quality with different 'products'



**SSAR**

**H**

**LERAP B**

IN CASE OF CONTACT WITH EYES, RINSE IMMEDIATELY with plenty of water and seek medical advice.  
WHEN USING DO NOT EAT, DRINK OR SMOKE.  
WASH HANDS AND EXPOSED SKIN before meals and after work.  
AVOID ALL CONTACT WITH SKIN AND EYES.  
WASH CONCENTRATE from skin or eyes immediately.

**Environmental Protection**  
To protect aquatic organisms respect an unsprayed buffer zone to surface water bodies in line with LERAP's requirement.  
Do not contaminate water with the product or its container.  
Do not clean application equipment near surface water.  
Avoid contamination via drains from farmyards and roads.  
Take extreme care to avoid drift onto crops and non-target plants outside the target area.

This product qualifies for inclusion within the Local Environmental Risk Assessment (LERAP) scheme. Before each spraying operation from a horizontal boom sprayer either a LERAP must be carried out in accordance with FSD's published guidance or the statutory buffer zone must be maintained. The results of the LERAP must be recorded and kept available for three years.  
DO NOT ALLOW DIRECT SPRAY from horizontal boom sprayers to fall within 5 m of the top of the bank of a static



## Project Context & Overview

- ECPA now wants to extend its project experience on improving pesticide use, by working with partners and stakeholders to reduce runoff and spray drift
- ECPA is making a new EU LIFE+ project proposal with partners, focussed on runoff and spray drift, called **PROWADIS** (**P**rotect **W**ater from **D**iffuse **S**ources)
- The AIM project is therefore a preparatory project, to ensure the technical and stakeholder frameworks are developed for the PROWADIS demonstration and dissemination project

## Spray drift reduction technology



- Regulatory authority use in risk assessments varies throughout EU
- An inventory of officially accepted drift mitigation measures (and associated reduction rates)
  - Proposals for a framework integrating SDRT into label language

- Operator awareness and availability of technology sporadic



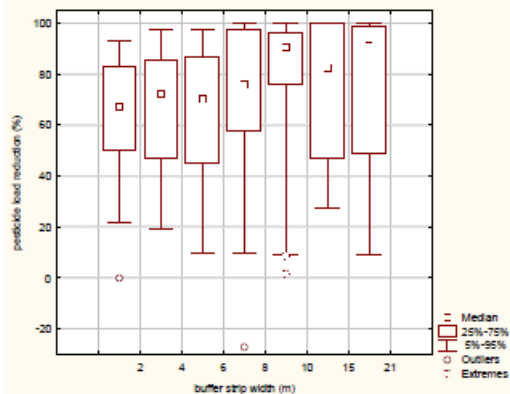
- EU master BMPs leading to country-specific BMPs in all project countries' languages



- Trainings for optimum sprayer set up and use of drift reducing technology



# Mitigating risk from runoff with vegetative buffer strips...



from: Reichenberger et al. (2006)

Average buffer strip efficiency:

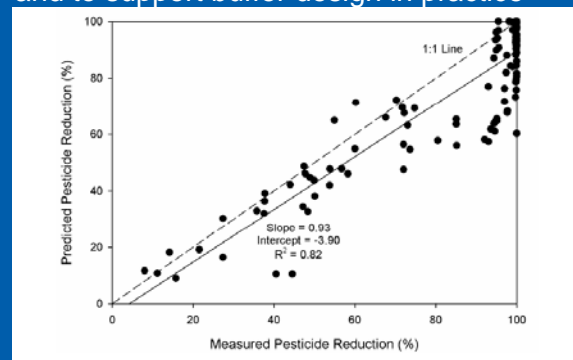
- 50% for 5m
- 90% for 10m
- 97.5% for 20m

Factors other than width influence buffer effectiveness

Key drivers – hydrologic response of buffer at time of event (infiltration; sedimentation) & phase distribution of the chemical.

VFSMOD-W can significantly improve prediction of pesticide trapping efficiency compared with field slope and buffer width

Can be used to assess the mitigation of vegetative buffer strips in risk assessments and to support buffer design in practice



from: Sabbagh et al. (2009)

## ... integrating into practical decision support tools...



Identify the main mechanisms of transport and the priority areas requiring mitigation

- delimitation of the study area
- geomorphologic and hydrogeologic characterization
- water quality data collection
- mapping of landscape elements (e.g. hedges, non-crop areas, forests)
- agricultural practices
- social and economical data
- non-agricultural pesticides (biocides) uses



- Buffer zones
- Hedges
- Riparian Strips
- Tillage Practices
- Cover crops

Advancing Intelligent Mitigation  
Best Management Practices

**Establish and Maintain Vegetated Buffer Zones**

<b>Aim</b>	Run-off Water / Drift
<b>Category</b>	Landscape Management
<b>Location</b>	In-field / Edge of Field
<b>Scale of Application</b>	Catchment
<b>Version</b>	03/09/2009
<b>Country</b>	
<b>Application</b>	All crops - All soils - With or without slope
<b>Contact</b>	

Picture 1 : Buffer zone at the edge of a field.

Picture 2 : Riparian buffer zone alongside a stream.

**Description of the BMP**

The efficiency of a buffer zone for reducing run-off water from field is well established. PPP can be transported in runoff water either adsorbed on suspended soil particles, or dissolved in the water phase. Studies show that buffer zones are effective filters for soil particles and diluted pesticides in runoff water on average, but their filtering capacity for particle sedimentation and water infiltration can vary in a wide range, depending on site conditions and rain event properties.

Due to the complexity and variability of factors controlling the effectiveness of a buffer zone, the recommendations for the location and sizing of buffer zones are essentially qualitative as a result of an empirical approach and experience:

- The main aim of vegetated buffer zones is to intercept runoff from cultivated plots upslope; therefore their positioning in the landscape is crucial.
- The positioning of buffer zone should consider the flow regime of surface water in a catchment: buffer zones should be preferentially located at sites near the origin of any linear runoff, in the upstream parts of the catchment.
- Surface runoff, initially diffuse at the level of the plot where it appears, tends to become more concentrated (and linear) as it flows downhill in the watershed. Different buffer zone types are required to match these different runoff scenarios:
  - In-field or edge-of-field grassed zones are needed to intercept diffuse runoff on or near the plot.
  - Roads alongside fields often act as a drain to collect runoff water, therefore establishing buffer zones alongside roads protects these potential drain lines from runoff water.
  - Establishment of grassed thalwegs is necessary to control and enhance infiltration of concentrated runoff in natural channels/hollows on hillsides.
  - In riparian areas near the edges of fields, grass filter strips are essential at the edge of the field to intercept runoff water before entering surface water bodies. - See the specific "Riparian Buffer Strip" flyer.

- Weather prescriptions
- Grass between lines
- Crop rotations
- Intermound enclosures



## The next steps

- **PROWADIS application to LIFE + submitted**
  - Demonstration sites
  - Tool development
  - Training programs for advisors
  - Dissemination programs
- **Establishment of a network of experts to support development of diagnosis tools and BMPs**
  - Spray drift reduction technology
  - Runoff mitigation
- **Proposals for product label language that support best practice and not constrain it.**
  - "Buffers... will have to be established in an intelligent way (guidelines edited by CORPEN) and should be used to meet several legislative demands and... environmental goals" Expert group on implementation of thematic strategy on sustainable use (DG Env, June 2009)



# Conclusions

- **Pesticides will continue to play a major, integral role in agricultural production in Europe. An integrated approach to crop management requires**
  - optimisation of the external inputs needed for productivity
  - identification and improvement of protection measures that reduce environmental impact
  
- **Protecting water from diffuse sources of pesticide contamination requires application of mitigation technologies based on sound science**
  - Spray drift reduction technologies
  - Cropping and tillage practices
  - Edge of field measures (vegetative buffer zones, constructed wetlands)
  
- **In line with the Thematic Strategy on Sustainable Use, ECPA wants to complete AIM and initiate PROWADIS, focusing on promoting catchment diagnosis and best management practices**

Thanks to the AIM team for input and advice

...and for your kind attention

The answer..... 7!