Strategies to reduce point sources of PPP to water

Results and lessons learned from the TOPPS project

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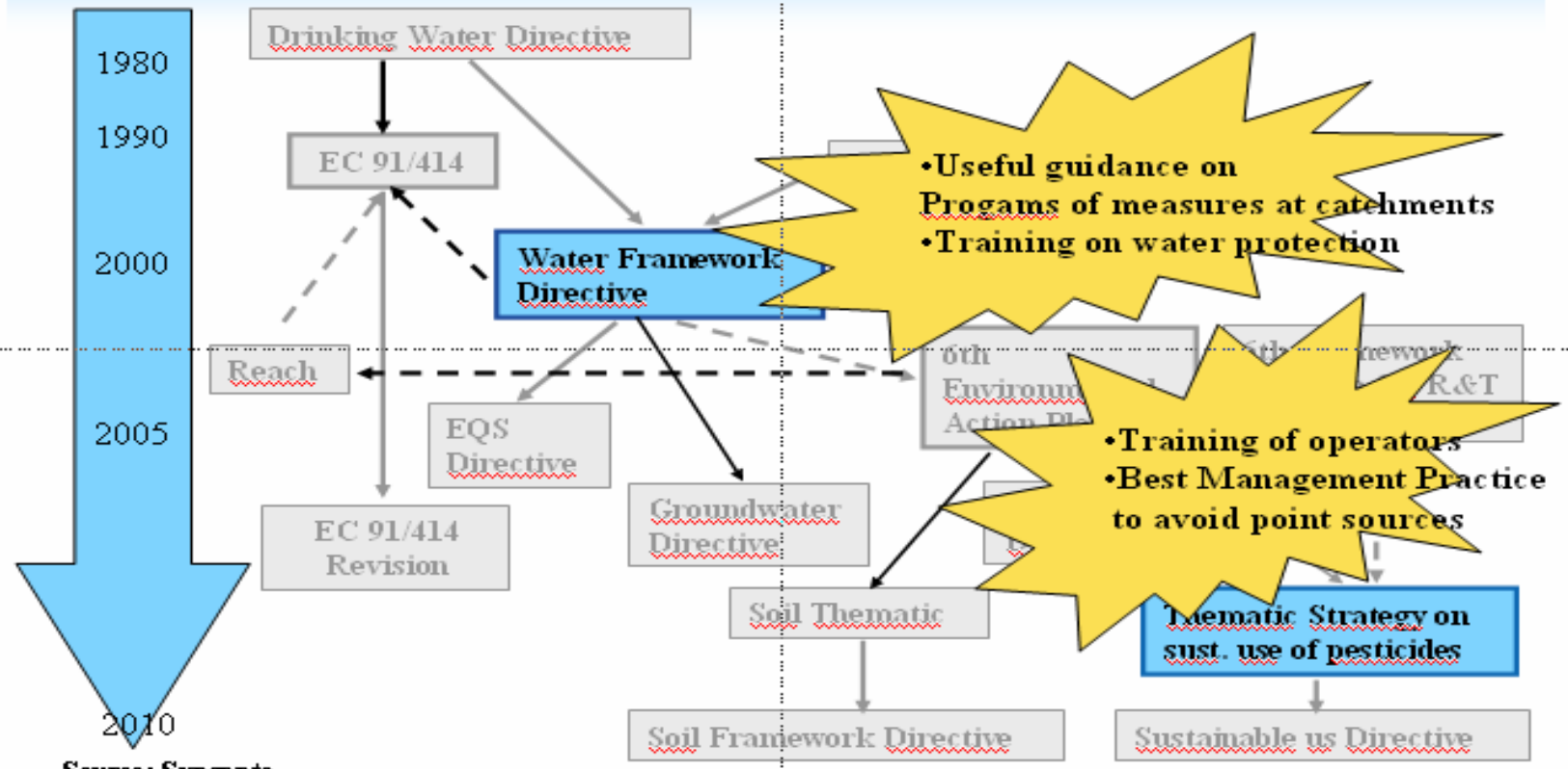
TOPPS: Train Operators to prevent Pollution from Point Sources

TOPPS is a 3-year, multi-stakeholder project covering 15 European Countries - it stands for Training the Operators to prevent Pollution from Point Sources which began 1st November 2005, and ends 30th October 2008.

TOPPS is funded under the European Commission's Life program and by ECPA, the European Crop Protection Association.

TOPPS is aimed at identifying Best Management Practices and disseminating them through advice, training and demonstrations at a larger co-ordinated scale in Europe with the intention of reducing losses of plant protection products (PPP) to water

TOPPS fits with the EU legislation framework



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Content

- Definition of entry sources of PPP to water
- Significance of point sources
- Results from stakeholder survey
- Elements to built a sustainable strategy to reduce point sources
- Key working processes (Examples)
- Farmers perception on the impact of various working processes on point sources
- Farmers perception on measures for improvements
- Needs to be done for a sustainable strategy (Conclusion)

Entry routes of PPP into water – Point and diffuse sources

Point sources: mainly related to inappropriate handling of PPP

- **Spillage of PPP concentrate or dilute spray (during filling, transport, spraying, cleaning of spray equipment)**
- **Management of residual spray solutions remaining in the sprayer after the spray operation (in field, on farm – remnant management)**
- **Poor field practice, (eg over-spraying ditches, wells)**

Diffuse Sources (not within scope of TOPPS today)

- **Surface runoff, or leaching which may occur following approved practices, spray drift.**


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TOPPS
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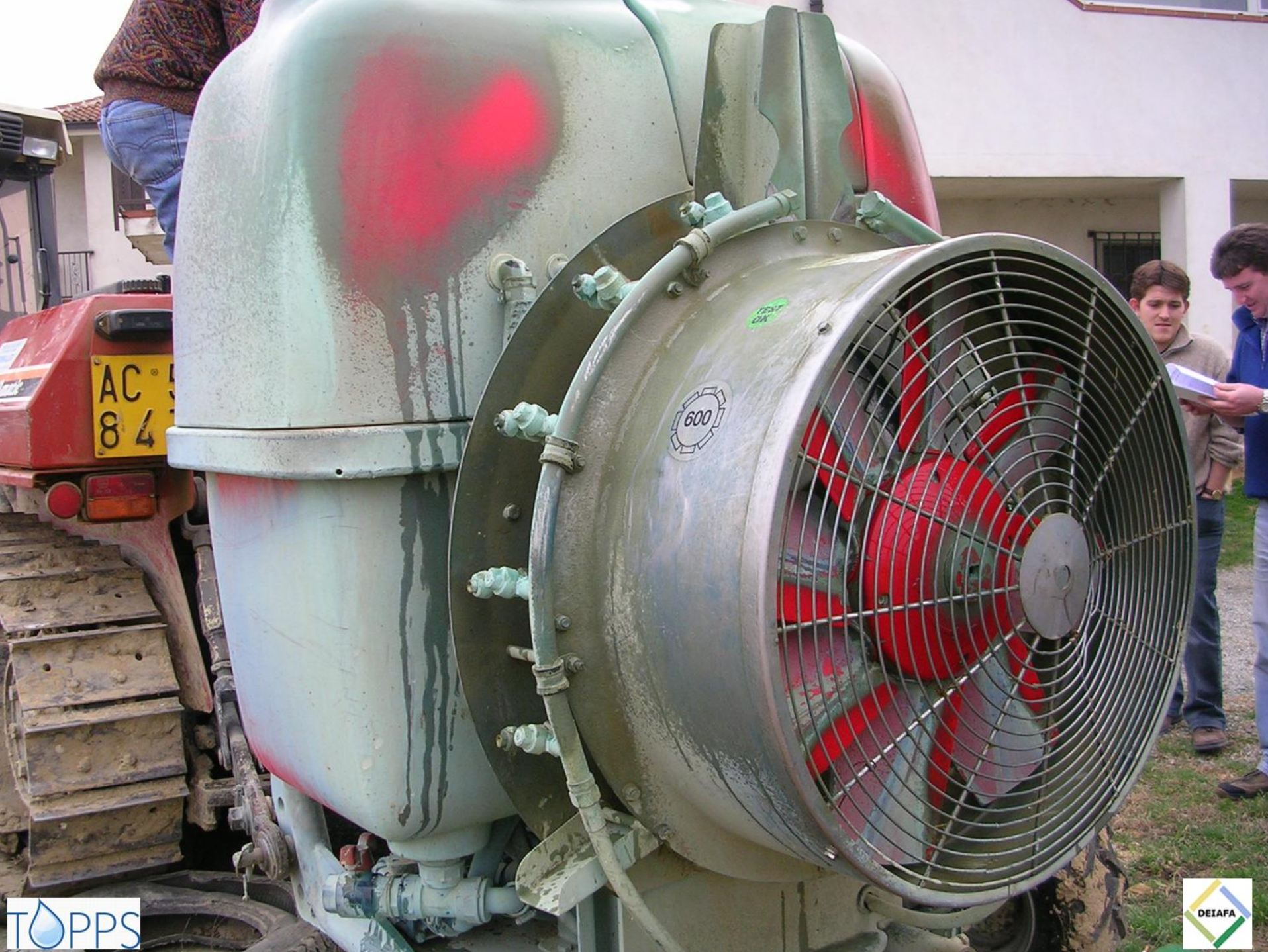
Undiluted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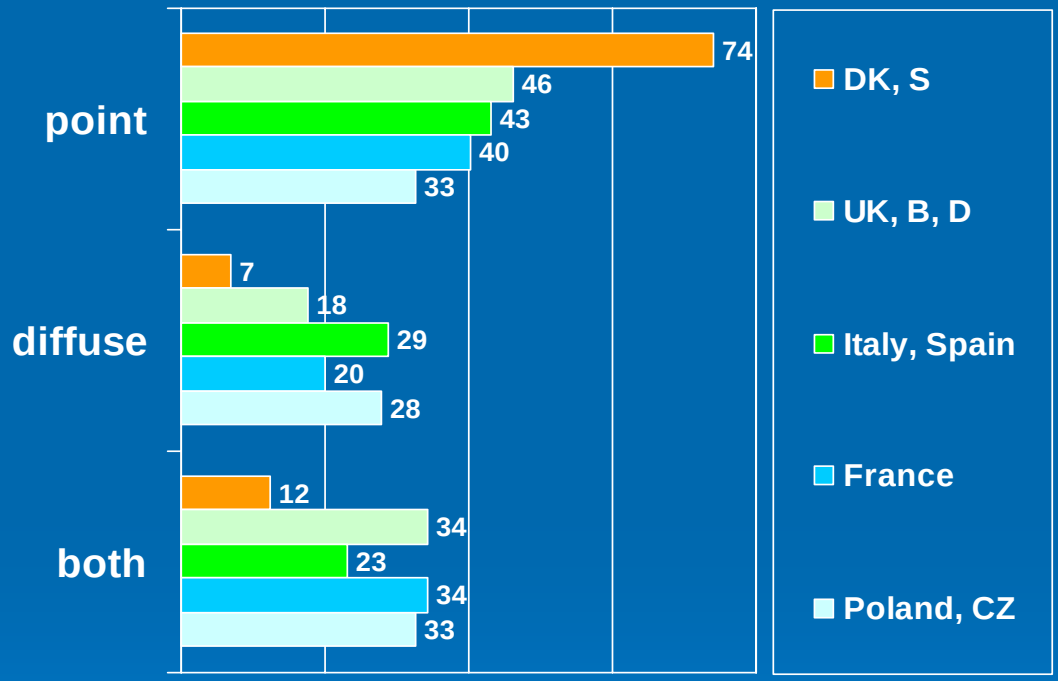
Point sources a underestimated entry route of PPP into water!?

- Few studies available indicate point sources are the most important entry route of PPP into water, they contribute **MORE THAN 50%** to PPP pollution of water (40 to 95%)

- Point sources can be avoided by adopting the right strategy and focus

Point sources are the most significant entry route of PPP into water as seen by stakeholders (Stakeholder survey)



Most distinct views on point sources in the Nordic

Stakeholder profile:

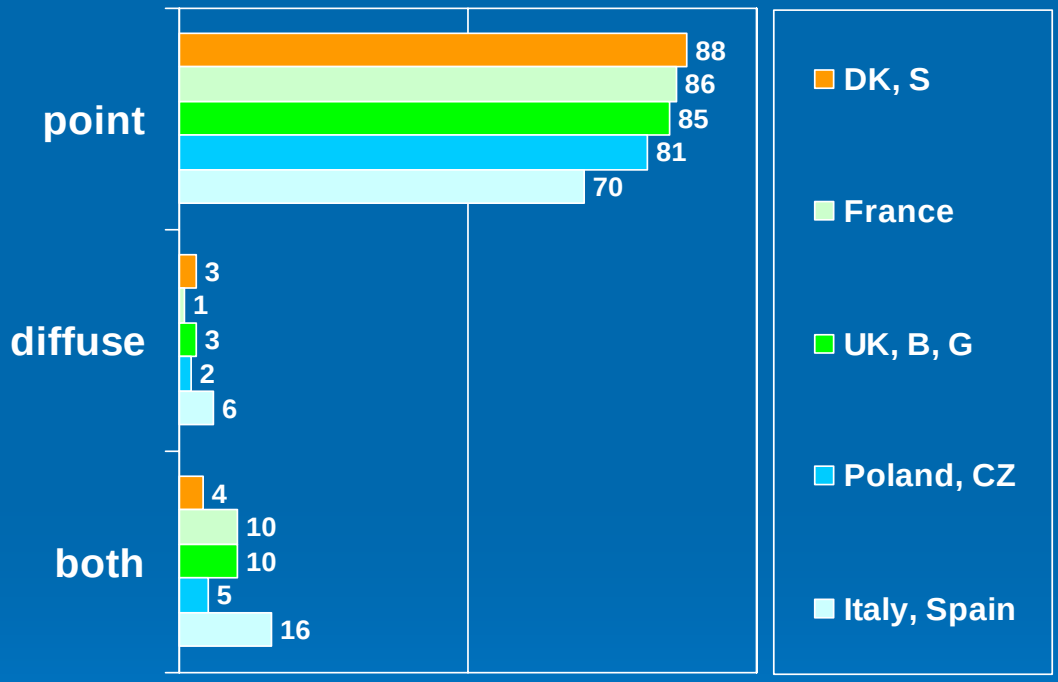
Farmadvice 29%
Plantproduction 20%
Research 8%
Watermanagement 8%

Majority has direct contact to farmers

Question:Which is the most important source of contamination of PPP to water?

Results - TOPPS European Stakeholder Survey June to October 2006								
Country	France	UK	Italy	DK / S	Belgium	Spain	Poland	Germany
n	199	85	84	73	46	41	40	27

Point sources can be easiest reduced according to stakeholders (Stakeholder survey)

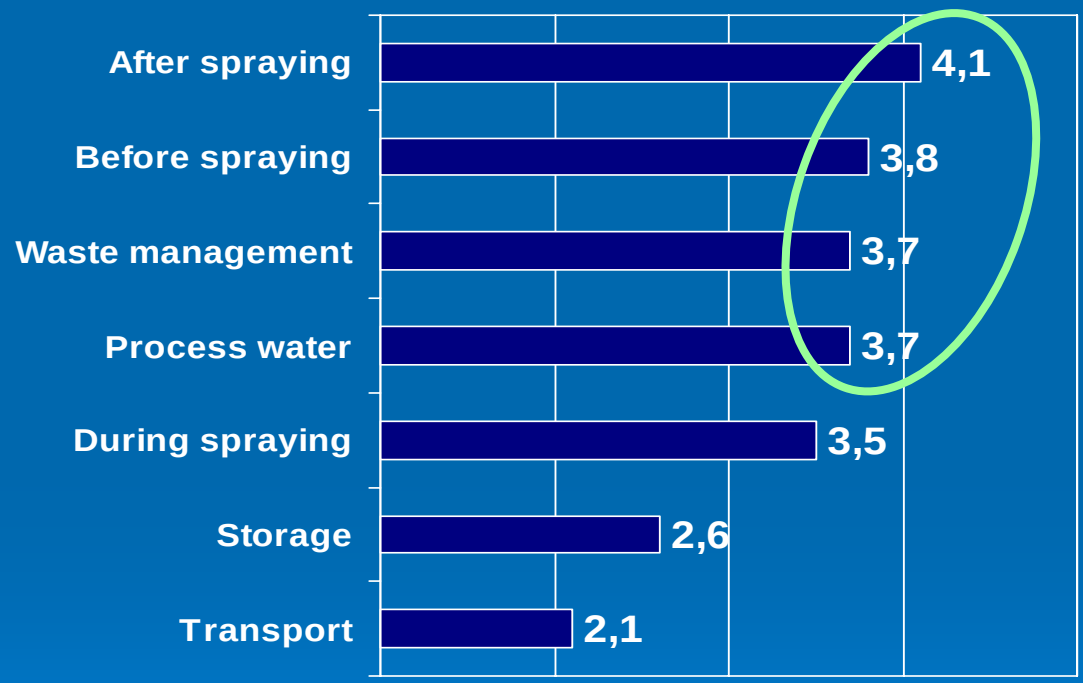


Broad consensus to focus on point sources for quick wins

Question:Which source of water contamination could be reduced most easily?

Results - TOPPS European Stakeholder Survey June to October 2006								
Country	France	UK	Italy	DK / S	Belgium	Spain	Poland	Germany
n	199	85	84	73	46	41	40	27

Perception of stakeholders on key working processes to focus to **reduce point sources -** Results: TOPPS Stakeholder survey



After spraying,

Before spraying and

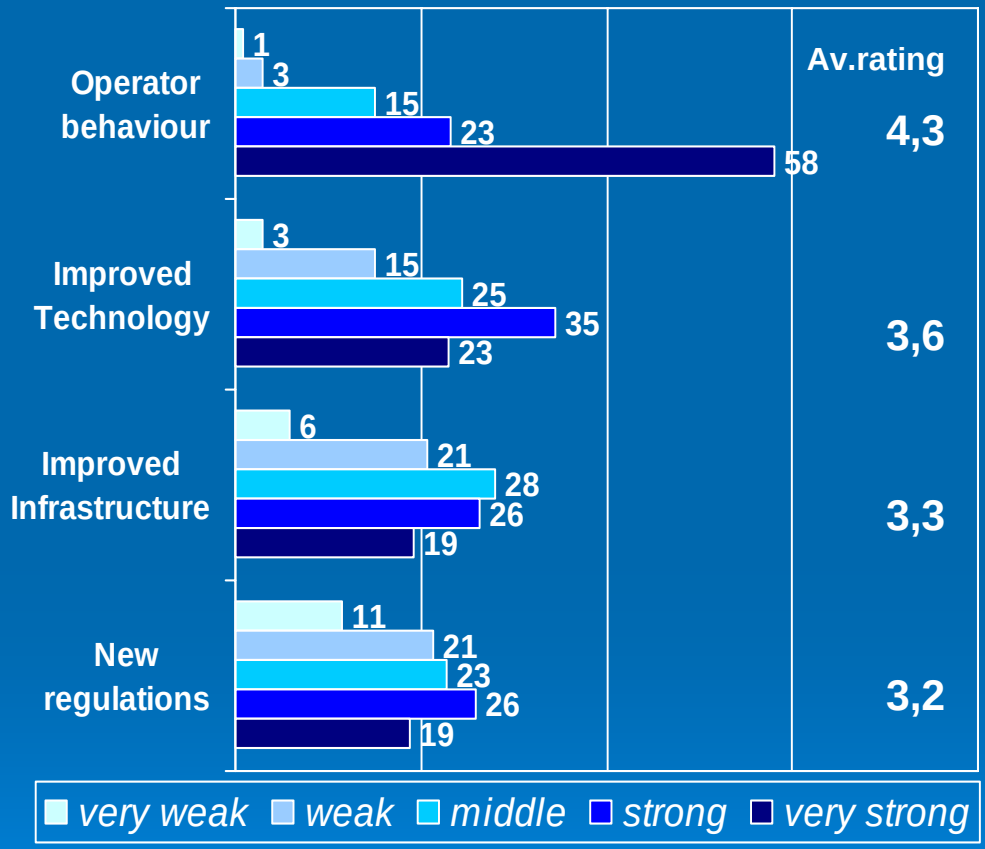
Remnant management

are the most important processes to focus on

* East: Storage No 1

Question: Rate each of the listed processes according to the potential in reducing ppp point sources (Rate 5= very effective – 1 = not very effective (average across al regions n=570)

Perception of stakeholders where changes could have biggest impact
Stakeholder Survey



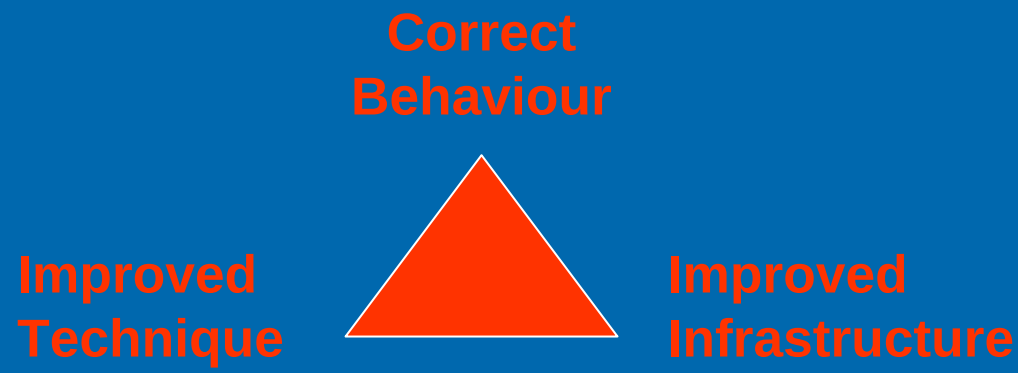
Majority expects strongest impact from changing operators behaviour

Second most important impact expected from improved technology

* East: Improved technology No. 1

Question: Where do you expect the most impact on reducing water contamination from point sources? ratings in % of respondents (very strong (5) to very weak (1))

Strategy to reduce point sources must be built on



.....along working processes

- Transport
- Storage
- Before spraying
- During spraying
- After spraying
- Remnant management

Strategy to reduce point sources must be built on (1)

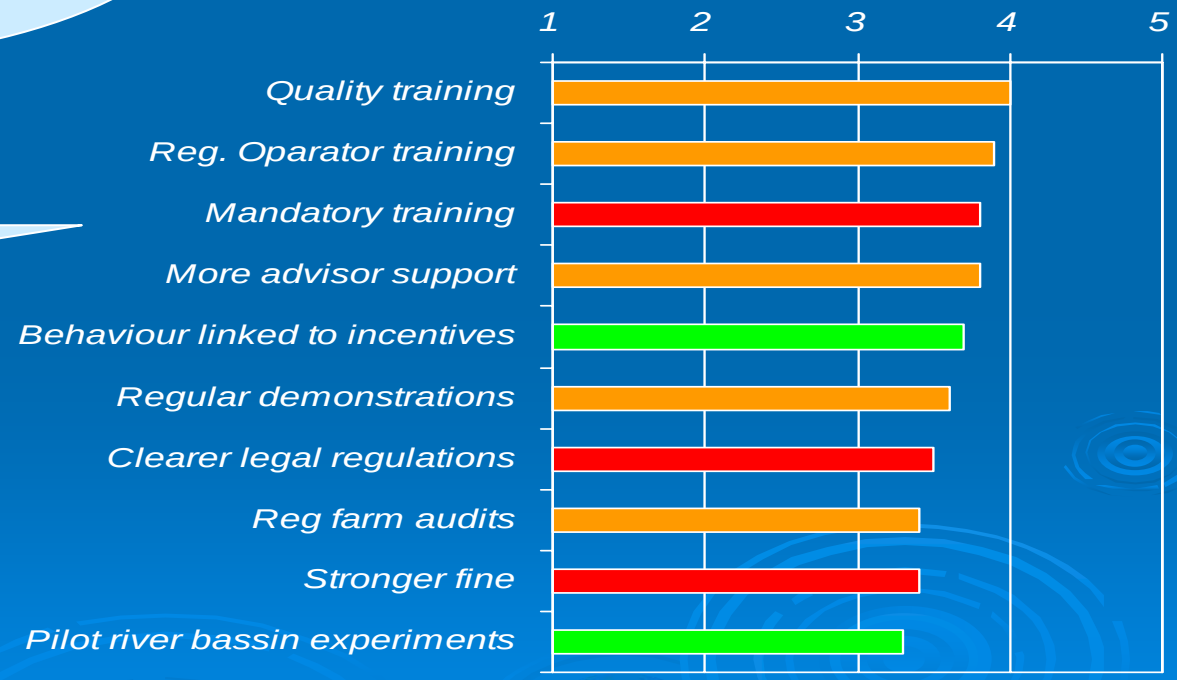
Advice + Training

Incentives **Regulations**

INFLUENCE

Correct Behaviour

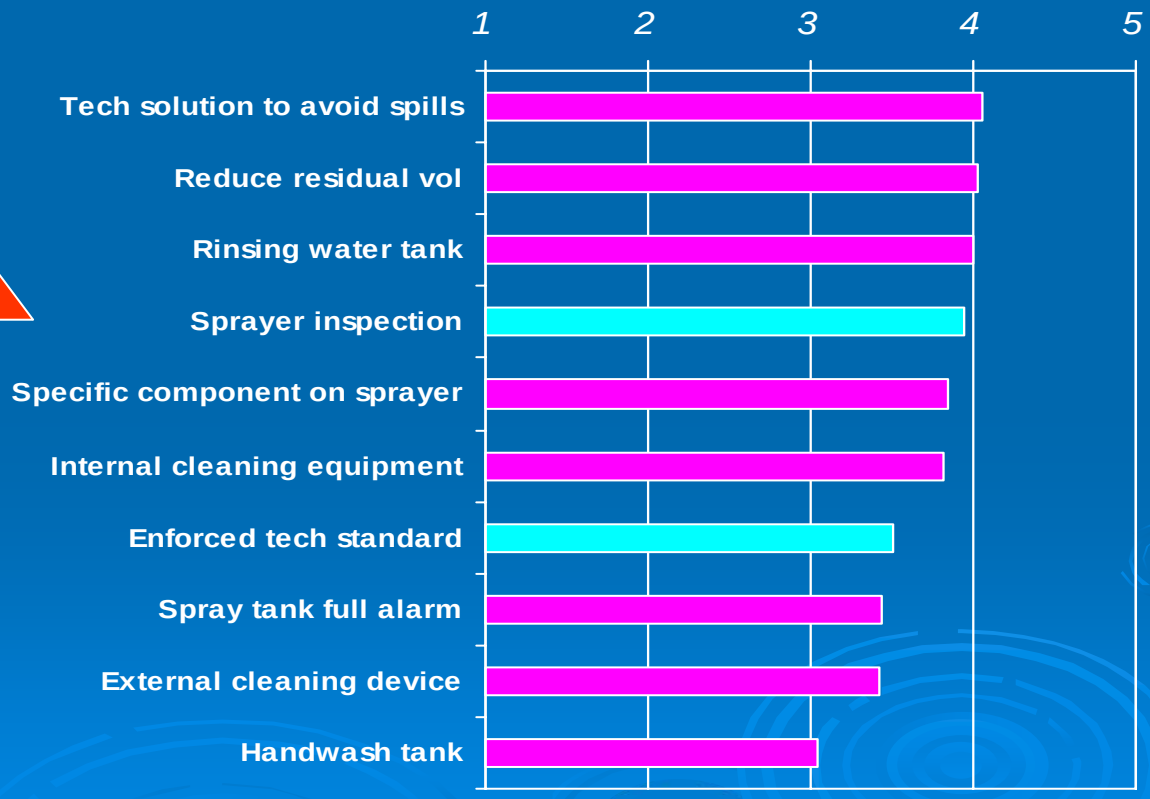
Top ten mentioned criteria able to influence operator behaviour
(stakeholder survey (rating: 5 strong..1 weak effect))



Strategy to reduce point sources must be built on (2)

Improved Technique

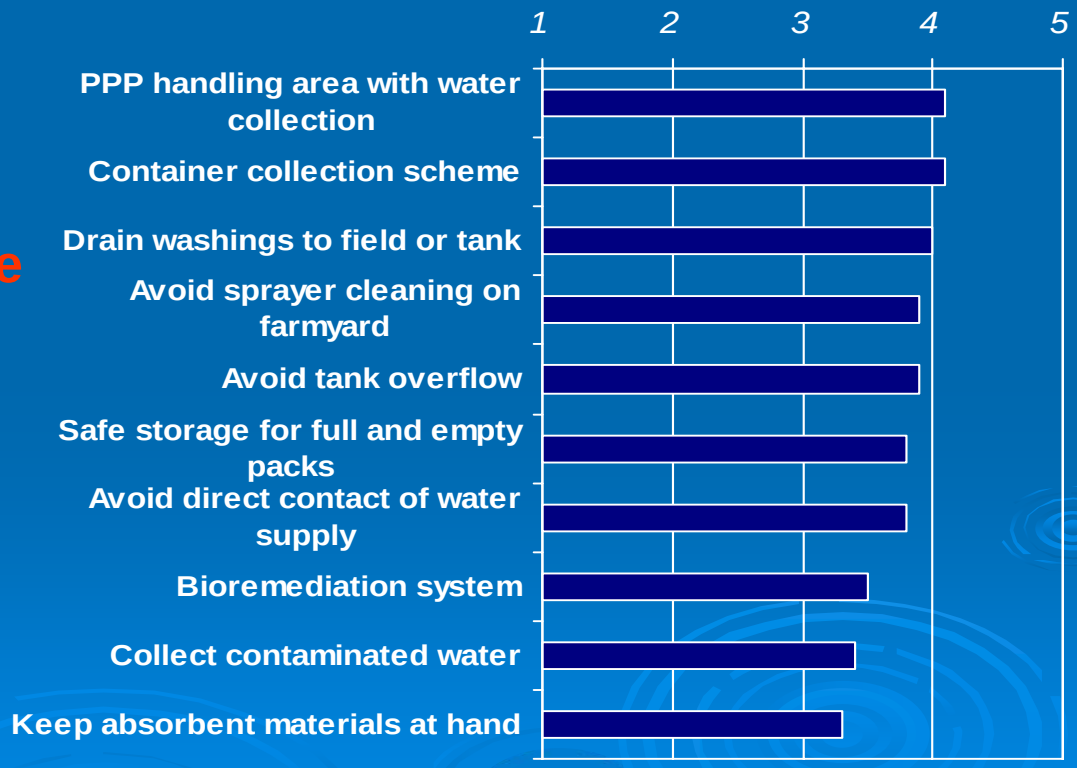
Top ten mentioned technical improvements to avoid point sources
(stakeholder survey (rating: 5 strong..1 weak effect))



Strategy to reduce point sources must be built on (3)

Top ten mentioned infrastructure improvements to avoid point sources
(stakeholder survey (rating: 5 strong..1 weak effect))

Improved Infrastructure



Working Process: Before spraying

Avoid spills – handling of concentrated PPP (Filling process)

....how often do you spill your coffee?

....how often must a farmer deal with measuring and filling of PPP ?

Variables

Number of sprayer fills	X	Number of applications	X	Number of products used
tank capacity water volume spray area		by crop		per application

- **Handling area to collect spills**
- **Flow meter avoid backflow and tank overflow**

Precautionary measures are absolutely necessary if filling on farm

Working Process: After spraying

Reduction of residual volumes of sprayers necessary and also technically possible (Cleaning process)

Current technical standards for sprayers are not demanding enough and not yet enforced in EU

Fieldsprayers - Standard

Total residual volume in l (EN 12761-2)				
Tank		Boom		
Tank volume	0, 5 %	length m	2l / m	Total litres
800	4	15	30	34
3000	15	21	42	57
4200	21	36	72	93

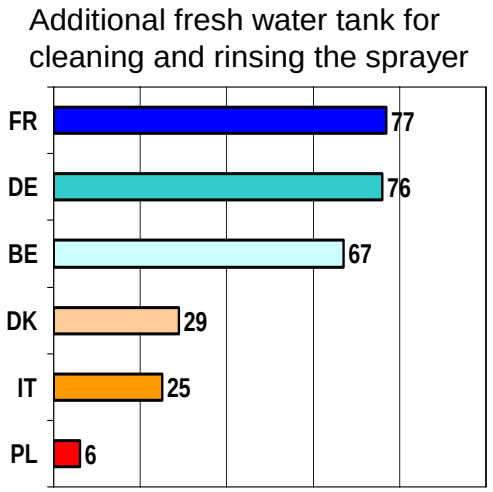
If the cleaning is not done properly these residual volumes may end up in the water

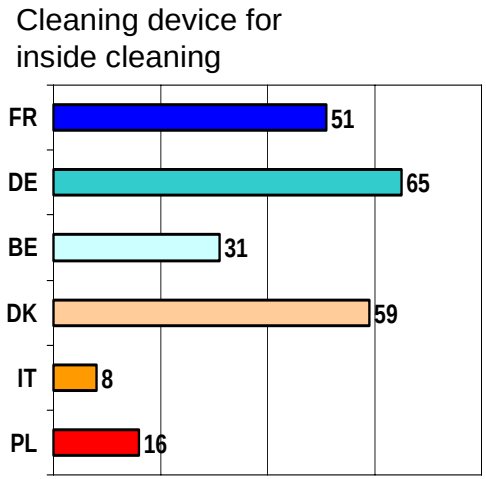
- Sprayers should be designed to optimized the residual volumes to the lowest possible level.
- It should be made a criteria to certify sprayers (level of regulation low today)

Working Process: After spraying

Upgrading of of sprayers necessary to enable Best Management Practices (Cleaning process)

Farmer Surveys / audits: 6 pilot areas FR;BE;DE;DK;PL;IT (Aquasite* , questionnaires)





Farmer surveys - Catchments

- Rinse water tank
  Key requirement to clean sprayer in the field

- Best Management Practice

After spray operation bring no or only lowest possible amount of contaminated liquid back to the farm in the sprayer!!!

*Aquasite is a registered trade mark of Arvalis

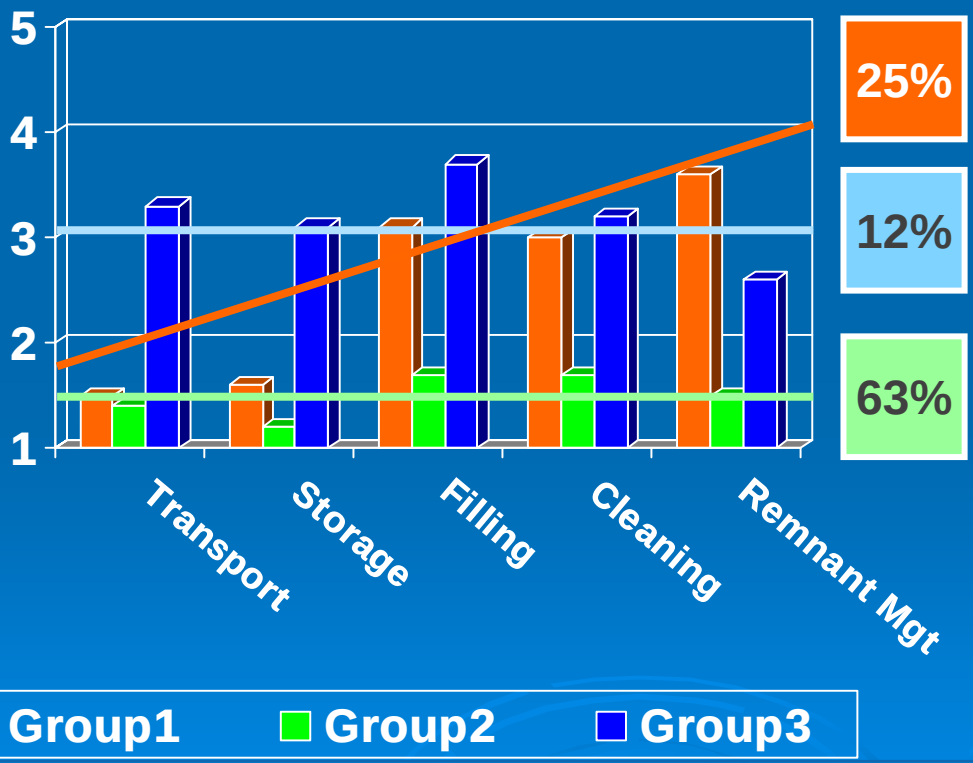
On average farmers evaluate the risks for water contamination by working process similar to the stakeholders

Rating of working processes on their impact for water contamination with PPP by farmers (Farmer surveys 2007)							
Ratings 5 = big impact... 1= low impact							
Country	**FR**	**DK**	**DE**	**BE**	**PL**	**IT**	**Average**
Process	Rating	Rating	Rating	Rating	Rating	Rating	Rating
Remnant management	**2,17**	**3,73**	**2,72**	**3,06**	**3,75**	**3**	**3,07**
Cleaning	**2,19**	**3,49**	**2,96**	**3,14**	**3,44**	**2,65**	**2,98**
Filling	**2,31**	**3,9**	**2,84**	**2,61**	**3,29**	**2,54**	**2,92**
Storage	1,51	3,03	1,93	1,25	2,31	2,16	2,03
Transport	1,63	2,76	2,05	1,25	2,28	2,09	2,01

Remnant management , cleaning and filling are the processes which have the biggest impact on water pollution from PPP

Awareness on potential risks is not homogenious

(Example: French study similar pattern in other catchments – cluster analysis)



Challenge !

How can we get awareness and information to those farmers, which are not reached by information and advice today ?

... any strategy to reduce point sources only works with the operators (Farmer surveys catchments)

Agreement to top 4 statements by farmers

What should be done to prevent contamination of water with PPP ? Farmer agreement to listed propositions % (Farmer survey six catchments 2007)							
Country	FR	DK	DE	BE	PL	IT	Average
Farmers should be financially supported to invest in technique and infrastructure	91	18	71	87	91	96	76
Give more advice to farmers	79	60	61	73	71	96	73
Farmers should attend regular trainings	66	38	63	23	81	79	58
Only farmers with special licence allowed to spray *	18	65	69	11	77	83	54

* Ideas on what a licence means may be very variable

Needs to be done for a sustainable strategy (1)

Technique and Infrastructure are enablers to comply with the BMPs and to mitigate the risks of PPP water pollution

- Upgrade **technique** (key requirements)
  Devices to support avoidance of spills (Induction bowl, container cleaning)
  Devices to support best cleaning (Rinse water tank, internal/outside cleaning
  Design sprayers with lowest possible residual spray volume
  Key performance criteria should be regulated and need enforcement

- Upgrade **infrastructure** (precautionary measures)
  Filling and cleaning on farm must have precautionary measures to collect any spills

  Storage and transport managed with precautions (BMPs)
  If remnants management necessary f.e biobed / biofilter could be an option

IMPORTANT: CONSISTENT ACROSS WORKING PROCESSES

Needs to be done for a sustainable strategy (2)

Key is **correct behaviour** to comply with Best Management Practices

- **Create awareness**
  Occupy mind space for water protection from advisers and operators
- **Provide information, training and advice regularly to advicers and operators**
  BMPs offer a consistent frame across the working processes
- **Provide incentives for operators**
- **Challenge! access to operators**
  All operators need to be informed and adviced regularly
  (It seems that current advice concepts are not reaching all)
- **Sustainable strategy only will work with the operators**

12 Partners und 9 subcontractors

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