



Crop protection and innovations for clean water

Leendertse, P., J. van Vliet, A. van der Wal en Y. Gooijer
CLM Research and Advice



Innovations for clean water:

- ▶ Bridging **gaps** between science, policy and farmers' daily practice
- ▶ Presentation based on **practical project experience** in the Netherlands for over 10 years
- ▶ Today's focus will be on:
 - 'win-win' innovations;
 - on barriers to their spread
 - and on how to overcome these barriers.

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Win-win measures?

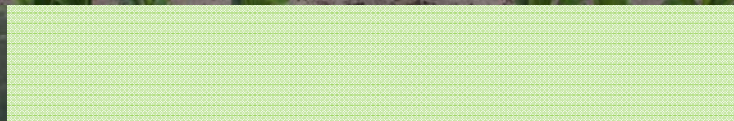
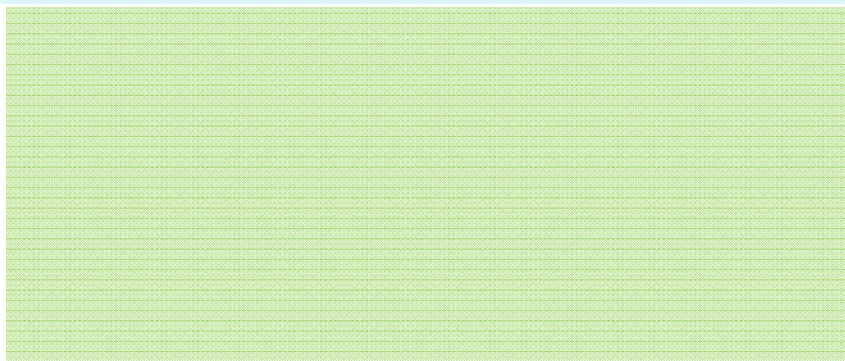
- ▶ Improvement in ground and/or surface water quality.
- ▶ Improvement for the farmer/ agro contractor:
 - Score high on practical applicability on the specific farm or business
 - Are cost-effective: profitable (after initial investment) or zero-cost AND/OR
 - Improve the quality of the crop (less crop damage or less residues)

Measures / Innovations	Water quality	Applicability On farm	Cost/benefit
Low emission techniques (eg air supported spraying, wingsprayer, GPS with section/ nozzle closure)	10	7	+
Choice for a resistant/less vulnerable race	7,5	7	++
Choice of chemical agent: pesticides with less environmental impact	10	5	+
Change plant distance/ rows	10	2	+
Decision support systems: pesticide, wheather circumstances and effectivity	10	5	+
Mechanical weed control (hoeing, harrowing and finger weeding)	5	4	0/+
Revision of pesticide stock for 'troublesome' pesticides	10	5	0
Spraying according to Early Low Dosing Sytem (LDS)/ row spraying	10	2	+
Choice of low-drift nozzles	7,5	5	0
Buffer strip	6	6	--
Processing of pesticide-contaminated waste water	5	5	-

Adapt. from Leendertse et al, 2012

Examples: low emission techniques

Measures / Innovations	Water quality	Applicability On farm	Cost/benefit
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Example: mechanical weeding

Measures / Innovations	Water quality	Applicability On farm	Cost/benefit
Mechanical weed control (hoeing, harrowing and finger weeding)	5	4	0/+



Gap between knowledge and application:

Arable farming (potatoes, sugar beets, onions, winter wheat and carrots)	Percentage of growers who knows the measures	Percentage of growers that applies the measures
Advice programme Gewis (potatoes, sugar beets, onions, carrots)	61-73	21-34
Decision support tool for Phythophthora (potatoes) or mildew/leaf spots (onions)	84-92	55-60
Choice for races with a low disease sensitivity (winter wheat)	99	96
Nitrogen tailored to need to prevent overfertilisation (winter wheat)	97	81

Van der Wal et al (2012)

Barriers for large scale application:

- ▶ **Risk perception:** insurance spraying
- ▶ **Commercial interests:** pesticide traders and competition with conventional machinery
- ▶ **Unfamiliarity with technique and payback time**
- ▶ **Personal interest**



Overcoming barriers:

The regional approach:

- ▶ Appeal to a common responsibility – challenge each other
- ▶ Increase familiarity with the technique:
 - demonstration in the locality
 - payback time calculation for the farm
- ▶ Decrease perceived risk:
 - Farmer-to-farmer communication
 - Independent and competent advisor

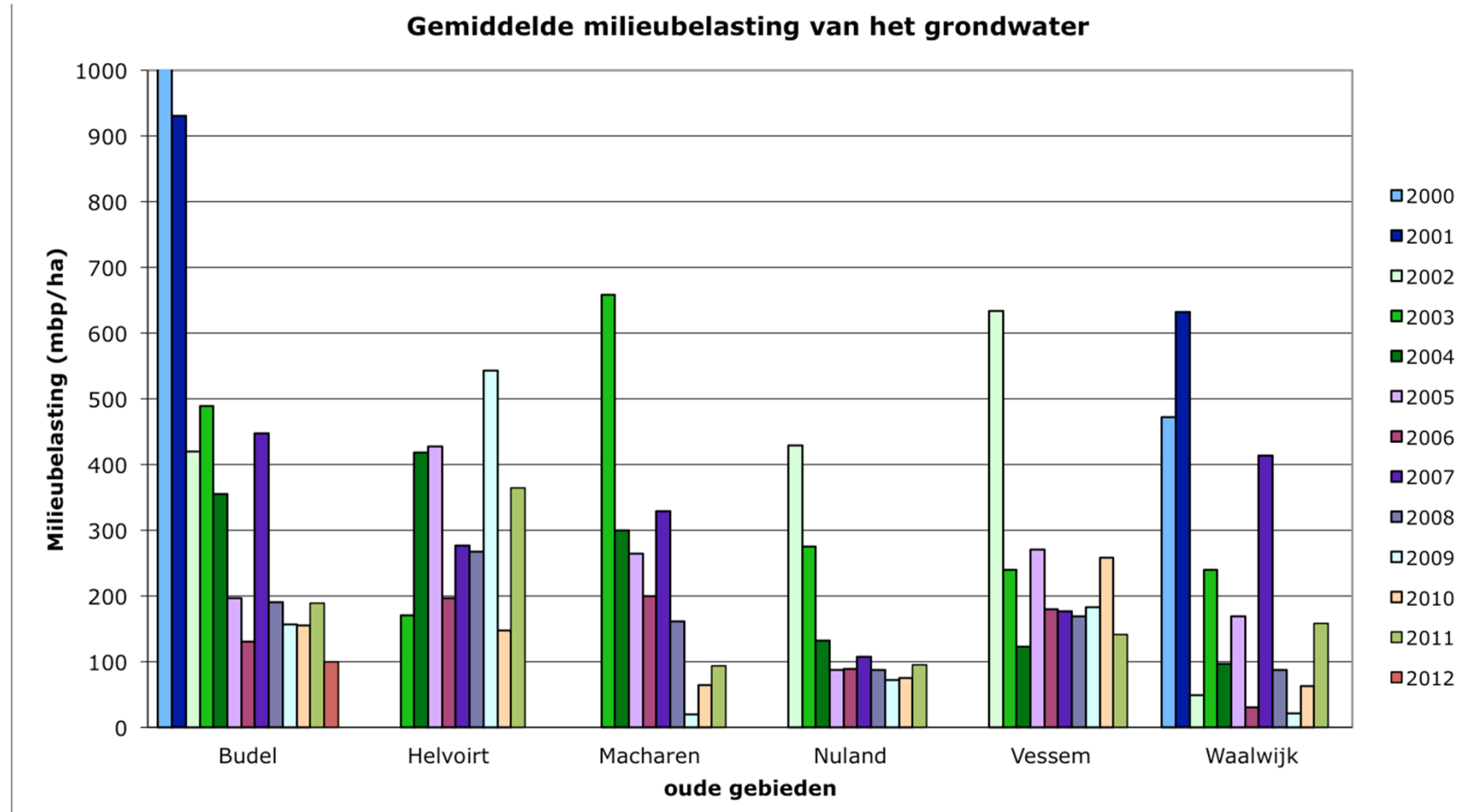


Enhance the impact of innovations:

- ▶ Co-development of innovation by scientists and farmers
- ▶ From an early stage



Example: Schoon Water voor Brabant



Van Vliet et al (2012)



Conclusions:

- ▶ There are enough win-win innovations to improve water quality
- ▶ But they will not spread autonomously
- ▶ Stakeholders should help to take away barriers for their spread

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