Sustainability evaluation of an innovative approach for managing brown spot disease on pears in Italy

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WP5 – Innovative IPM in Pomefruit

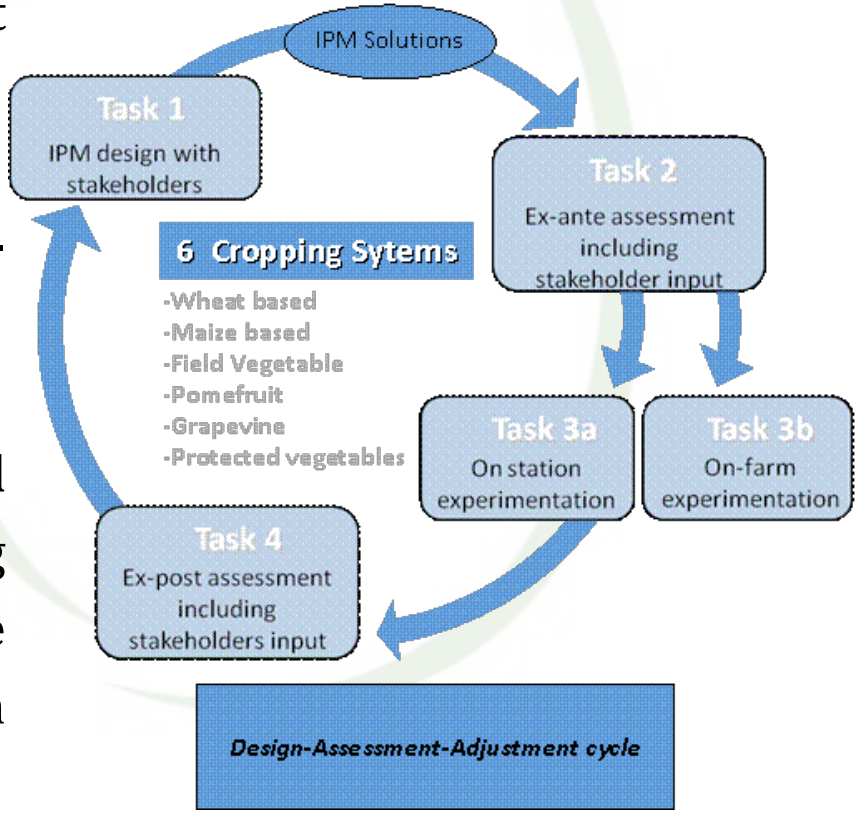
PURE Final Congress, 14-16 January 2015, Poznan (PL)

Aims of Work Package 5

1. **Produce IPM solutions** that address the **most critical** pest problems in pomefruit systems

2. **Test candidate IPM** solutions **on-station and on-farm**

3. **Assess and compare field-tested candidate IPM solutions** using **multiple criteria** and endorse **viable solutions** for mainstream dissemination



Abate Fetel

Conference

William

Decana

Max Red Bartlett

Kaiser

In about **26.000 ha** Emilia-Romagna has about
70% of Italian pear production

Pera dell' emilia-romagna igp

Critical disease

The climatic conditions of the Po Valley are often favourable **for brown spot of pear** caused by the fungus *Stemphylium vesicarium*

This disease represents a major treat for growers and requests **15-25 sprays/year**, to avoid **yield losses of 50-60%**

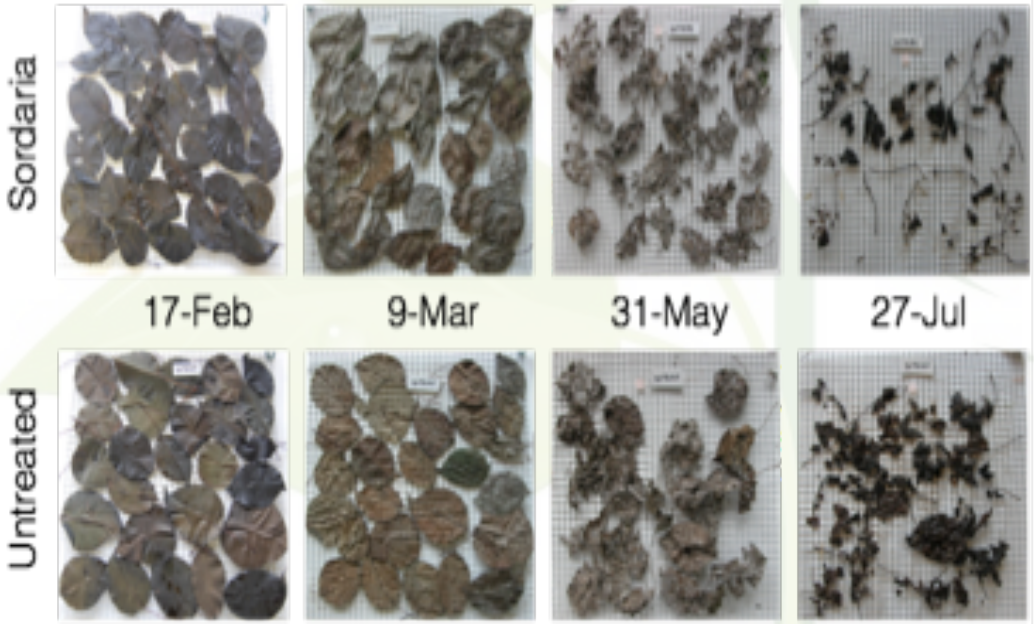
The approach carried out in the experimental sites to design advanced IPM orchards is based on the integration of:

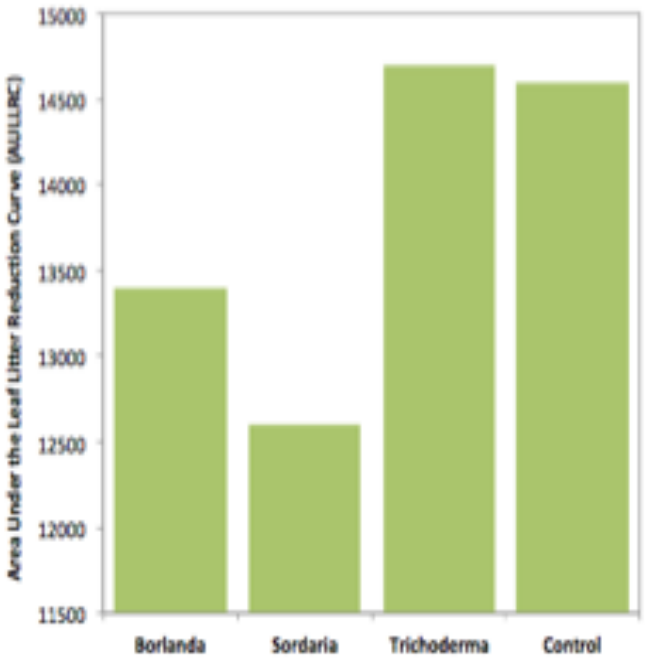
1. **degradation of the leaf litter** where the pathogen overwinters and sporulates **to reduce the inoculum**, provided by biocontrol agents, and the

2. **reduction of the number of treatments** by Decision Support System (DSS for scheduling fungicide applications.

On-station experiment

Leaf litter samples were treated (vinasse, *Sordaria fimicola* and *Trichoderma*) at the end of the winter and the amount of leaf residues **and the speed of degradation were assessed at regular intervals** by an image analysis software **until early August**



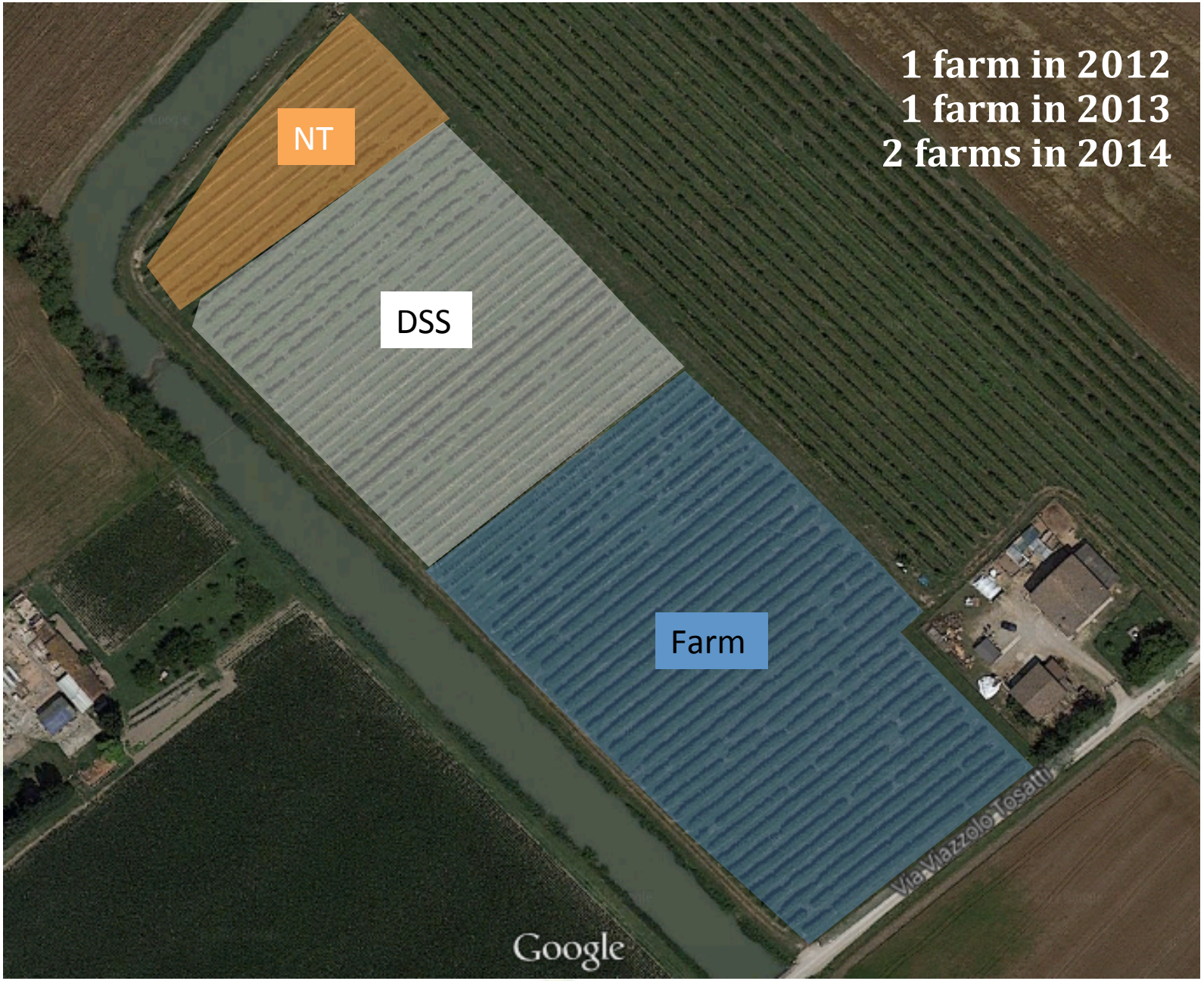


On-farm experiment

In **on-farm experiments**, two systems were compered:

i) a **baseline system**, representing the average of IPM production in North Italy

ii) an **innovative IPM system** where the use of a Decision Support System (DSS) for scheduling fungicide applications was combined with leaf litter removal and periodical applications of Biological Control Agent (*Trichoderma* spp.)


1 farm in 2012
1 farm in 2013
2 farms in 2014
NT
DSS
Farm
Google

May 2012

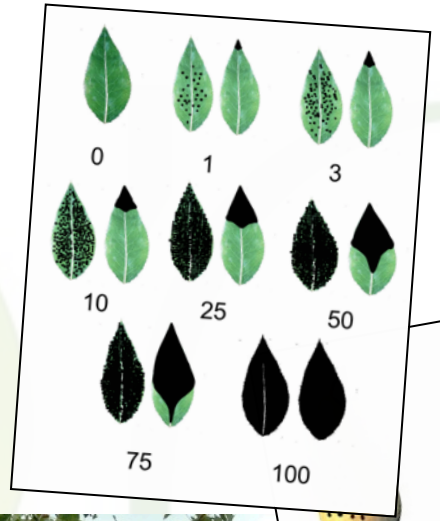
Nuovi fenomeni di liquefazione a Uccivello di Cavezzo.wmv
by AGSCOSMO
YOU reporter.it

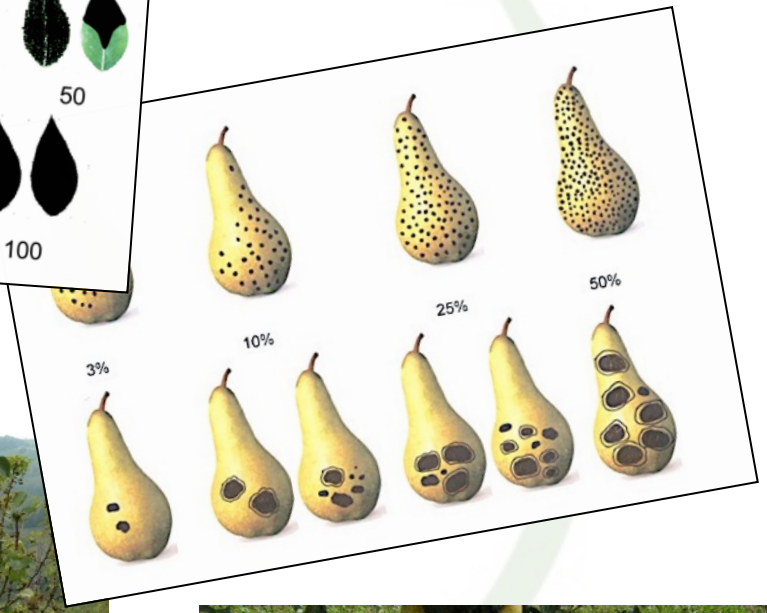
May 2013

January 2014

20 MAGGIO 2012
PUOI SPEZZARE LA NOSTRA TERRA, MA NON IL NOSTRO CORAGGIO.
ALEX FIORATTI TRIBUTO A TUTTI GLI EMILIANI

Periodic disease assessment



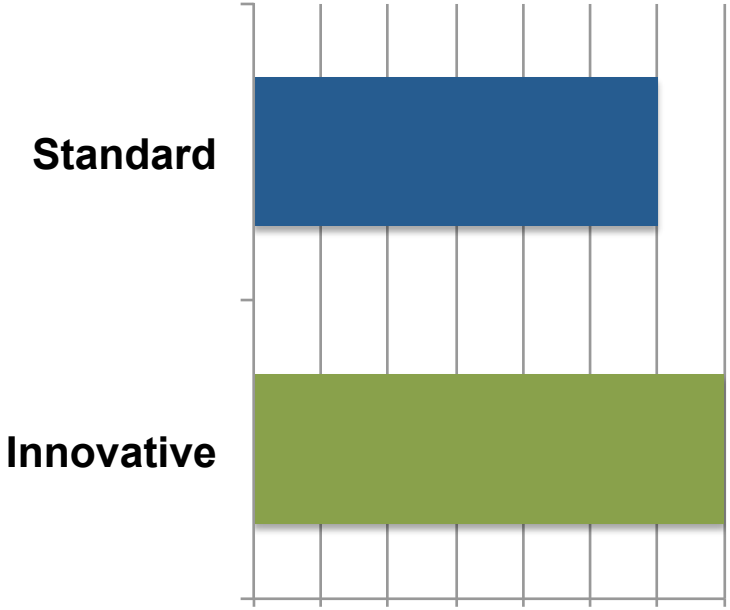


Results

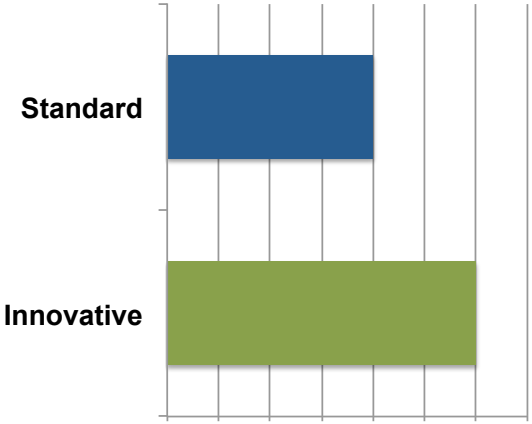
	Baseline	Innovative
Tractor rides	18	14
No. of fungicides	19	11*
TFI	21	10
Disease incidence (%)	7.90	7.95
Premium class (t/ha)	34.5	34.2
Other (t/ha)	7	7.5
Total yield (t/ha)	41.5	41.7

Sustainability assessment

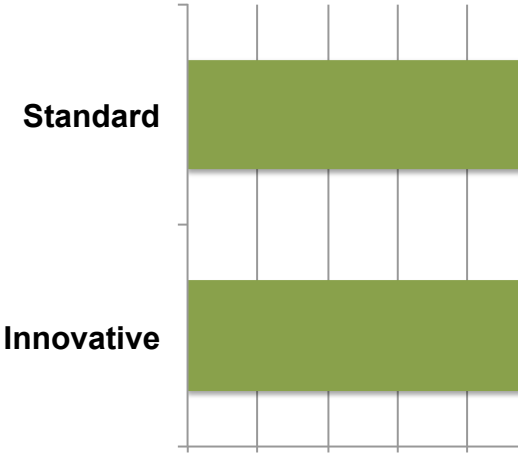
Overall Sustainability



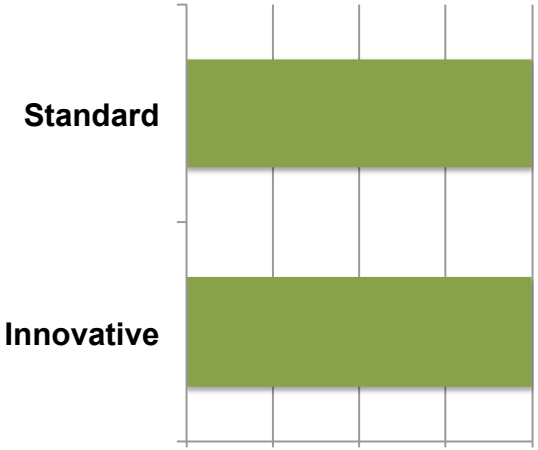
Environmental sustainability



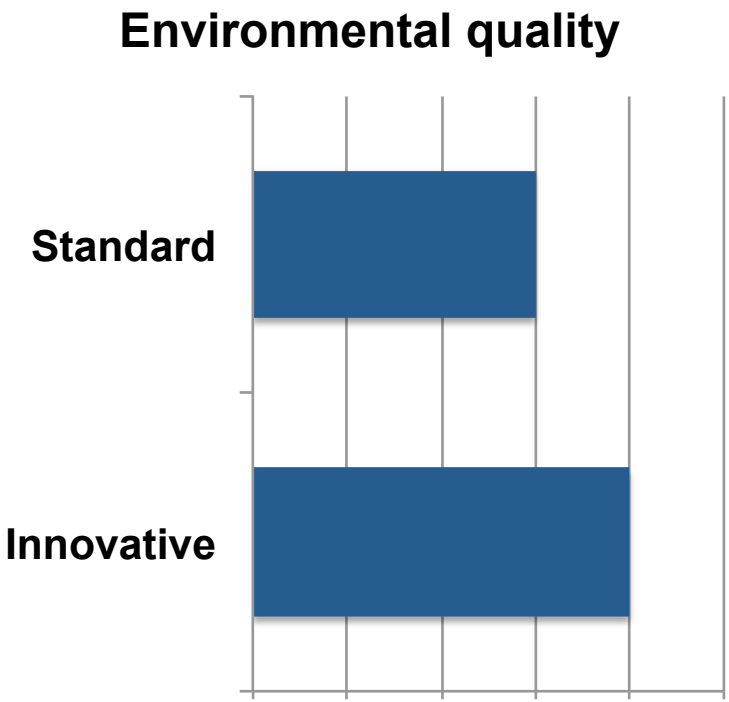
Economic Sustainability

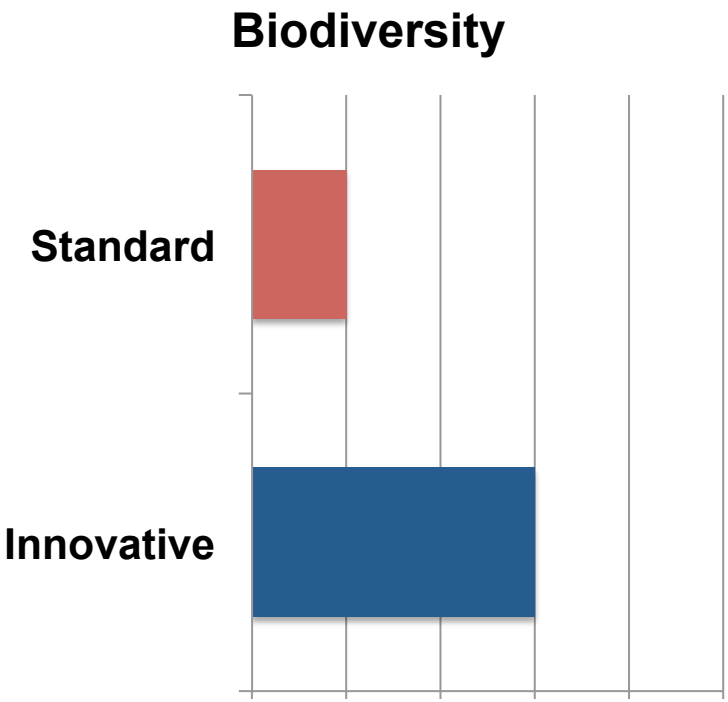


Social Sustainability



Sustainability assessment





Conclusions

- **Protection** obtained by farmers using the information **provided by the DSS was never different by** the one obtained according **the baseline strategy**

- Over two seasons, **the TFI of the Innovative approach was reduced of 63% compared to the Standard** practice

- **The Innovative approach** allowed to use fungicides with a better **ecotoxicological profile,** to reduce **the impact on biodiversity** of the orchard and to enhance its **environmental quality**

Thank you for your attention!

The research leading to these results has received funding from the European Union Seventh Framework Programme (FP7/ 2007-2013) under the grant agreement n°265865- PURE