Integrated Crop Protection:

a hot potato?

Phytofar

Tuesday, 1st of Sept 2015 - Kick-off meeting Potato Europe

Content

1. **Phytofar?**
2. **Some key figures illustrating our industry**
3. **IPM in potato**
   - **Definition**
   - **Different aspects and solutions**
     - **Specifically related to potato growing**
     - **General aspects to safeguard human health, environment and biodiversity**
4. **Conclusions**

Phytofar – Belgian Association of Crop Protection Industry

Phytofar ?

- ✓ **Phytofar = the Belgian-Luxembourg Association of Crop Protection Industry**
- ✓ **Phytofar represents for its members all products that fall under Regulation 1107/2009 (chemical, biochemical and microbiological) for all farming methods and farm types**
- ✓ **Phytofar is active in the professional segment (agri and non-agri) and in the "home & garden" segment**
- ✓ **Phytofar promotes the proper use of plant protection products to ensure a sustainable agriculture with respect for people, animals and the environment**
- ✓ **Mission: healthy and safe food for everyone!**
- ✓ **18 members: Adama, Agriphar, BASF, Bayer CropScience, Bayer Environmental Science, Belchim, Certis, Compo, Dow AgroSciences, Dupont, Eastman, Edialux, Hermoo, Monsanto, Nufarm, Protex, Scotts, Syngenta**
- ✓ **More info? www.phytofar.be ; tel 02 238 97 72 ; info@phytofar.be**

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Why is Integrated Pest Management (IPM) IMPORTANT

Source: ECPA

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Role of the Crop Protection industry

RESEARCH & DEVELOPMENT

- Developing innovative chemistry and other control agents to manage insects, weeds and diseases
- Improving crop varieties with pest and disease resistant traits

TRAINING

As part of an on-going commitment to stewardship, the crop protection industry has several initiatives in place providing for training on best management practices, including IPM strategies.

RESISTANCE MANAGEMENT

Over time, pests can develop resistance to different control methods. The plant science industry works to provide strategies and information that can help farmers manage insect, weed and disease resistance.

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Some key figures illustrating our industry

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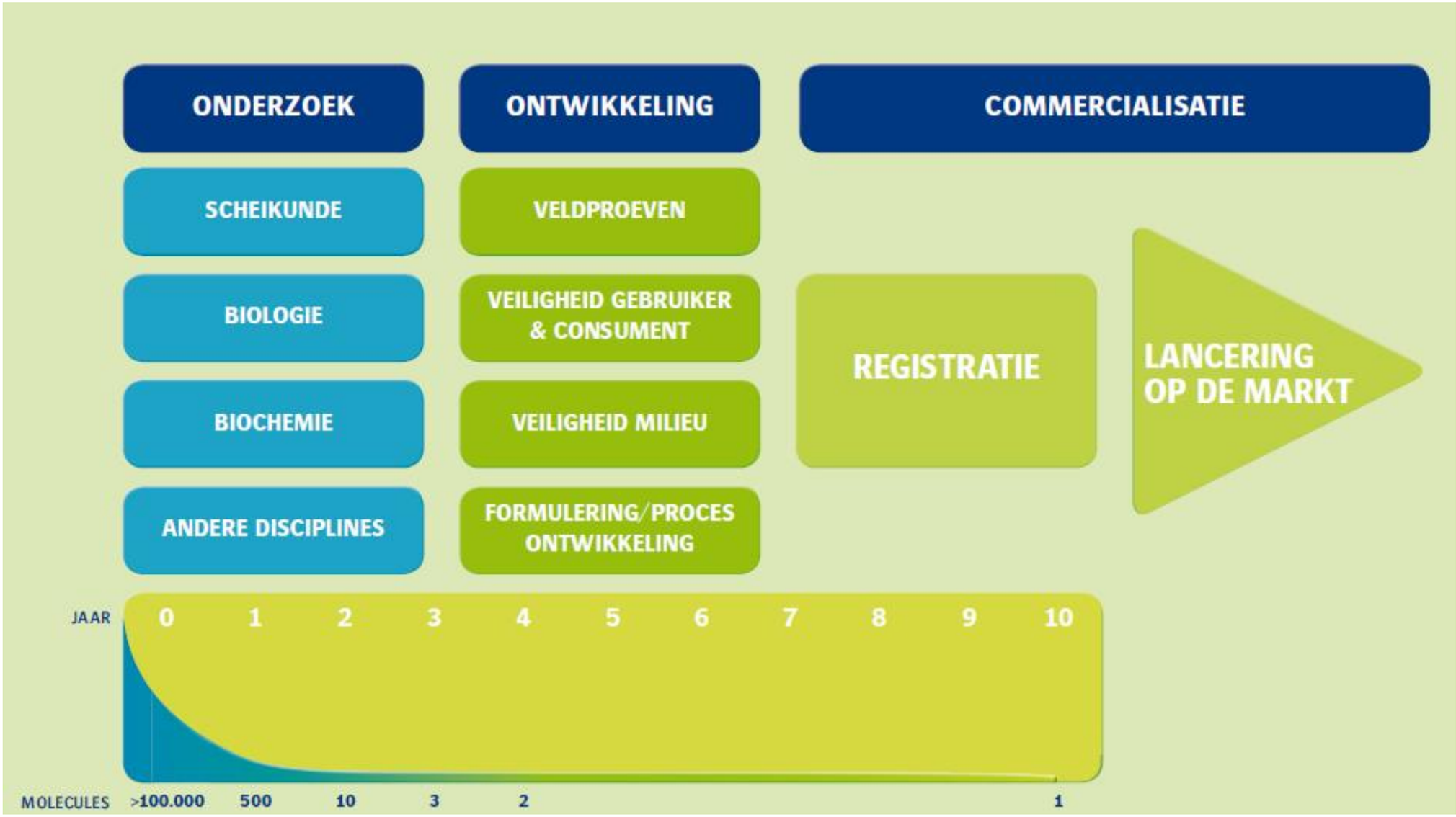
Development time of a PPP & EU impact



Source: Philip Mc Dougall

=> Such long development timelines require a realistic and stable legislation

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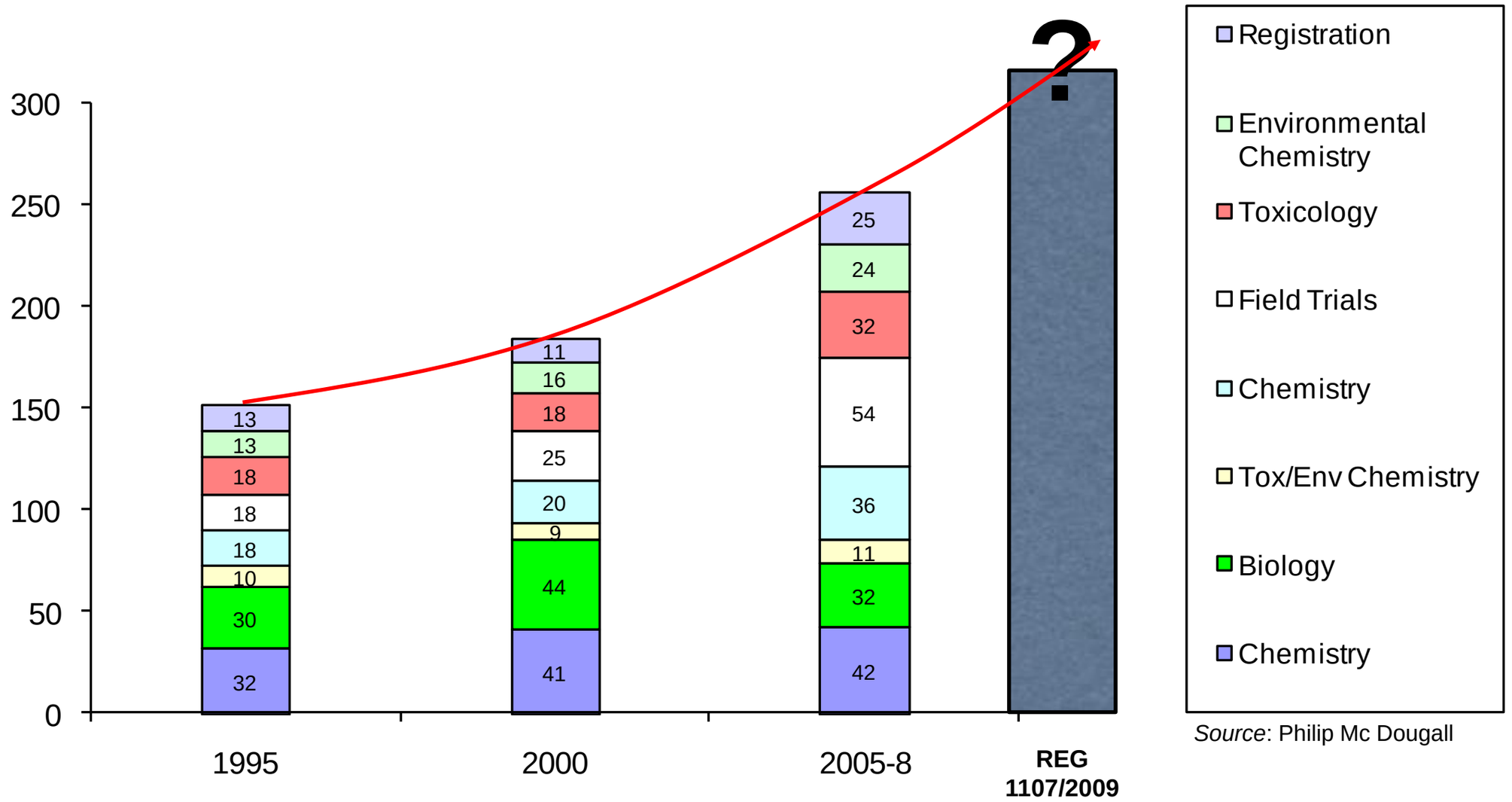
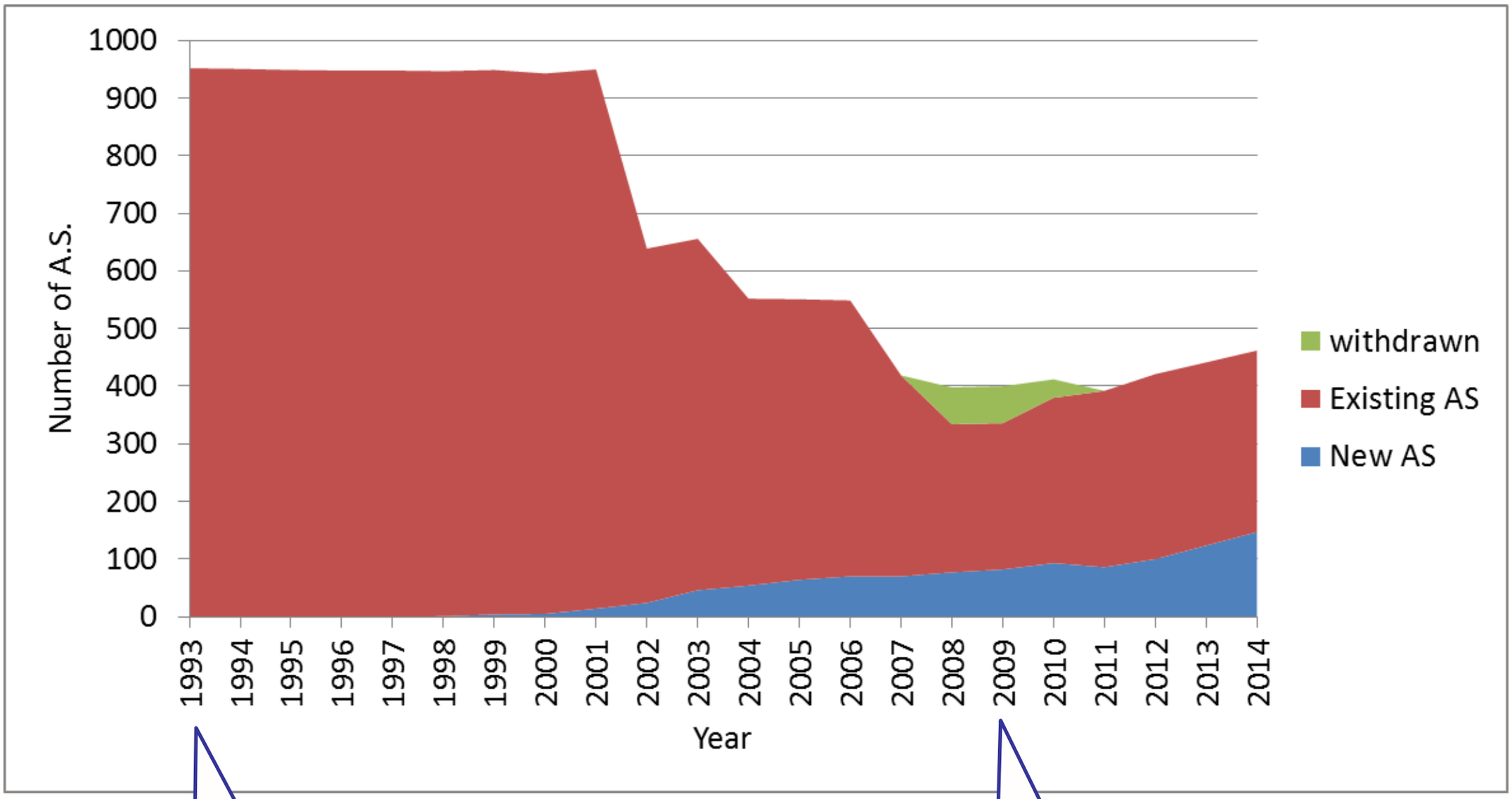
Development cost of a crop protection product



Source: Philip Mc Dougall

	1980 – 1989	1990 – 1999	2005 - 2014
New Active Ingredient (A.I.) Introductions	123	128	73
% New A.I.s targeted at Europe	**33.3**	**31.3**	**16.4**
Total R&D spend (Inc. GM) $m	1271	3060	6711
% Total R&D on new A.I.s for Europe	**33.3**	**25.0**	**7.7**

Evolution of authorised active substances in the EU



Source: ECPA

Dir 91/414

Reg 1107/2009

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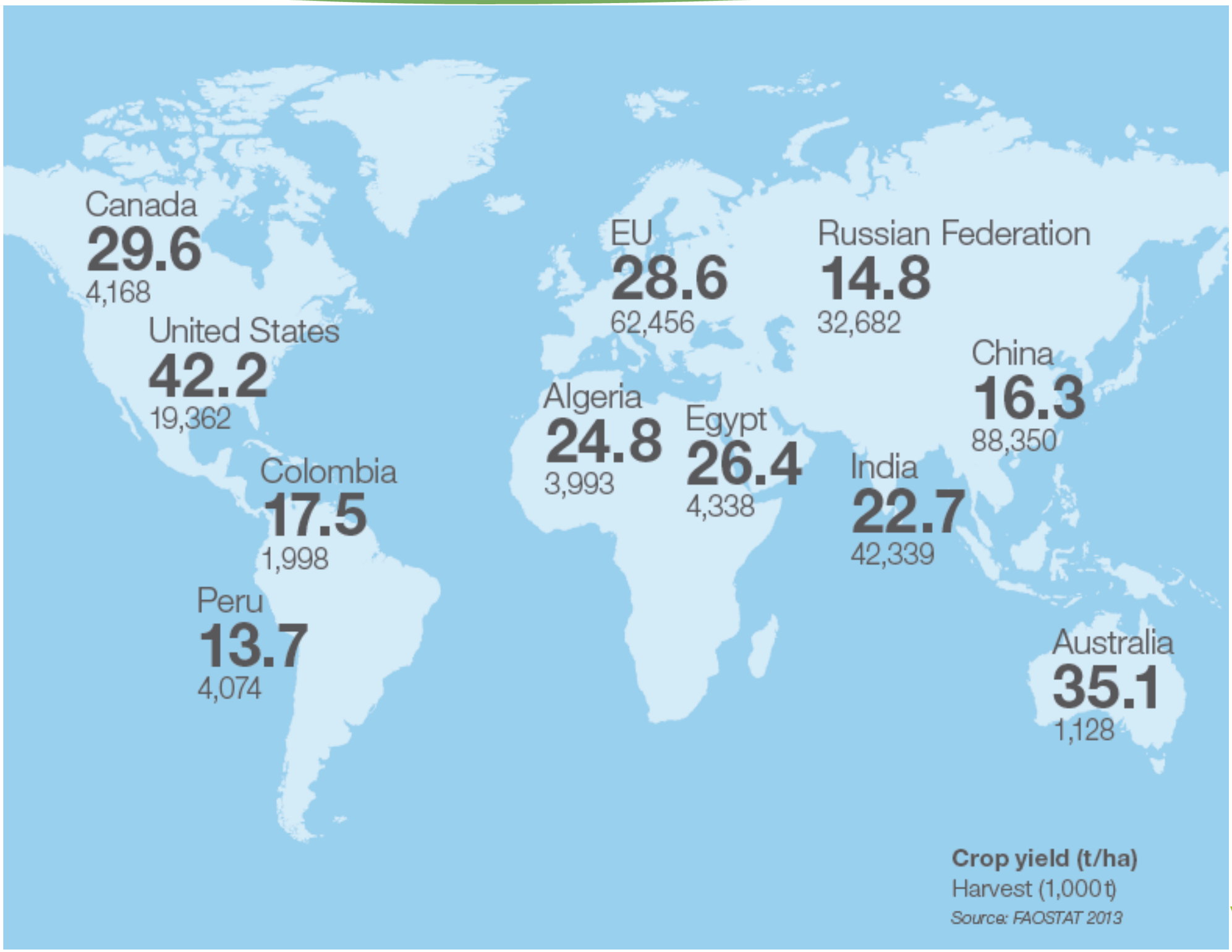
Global potato production



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IPM in potato

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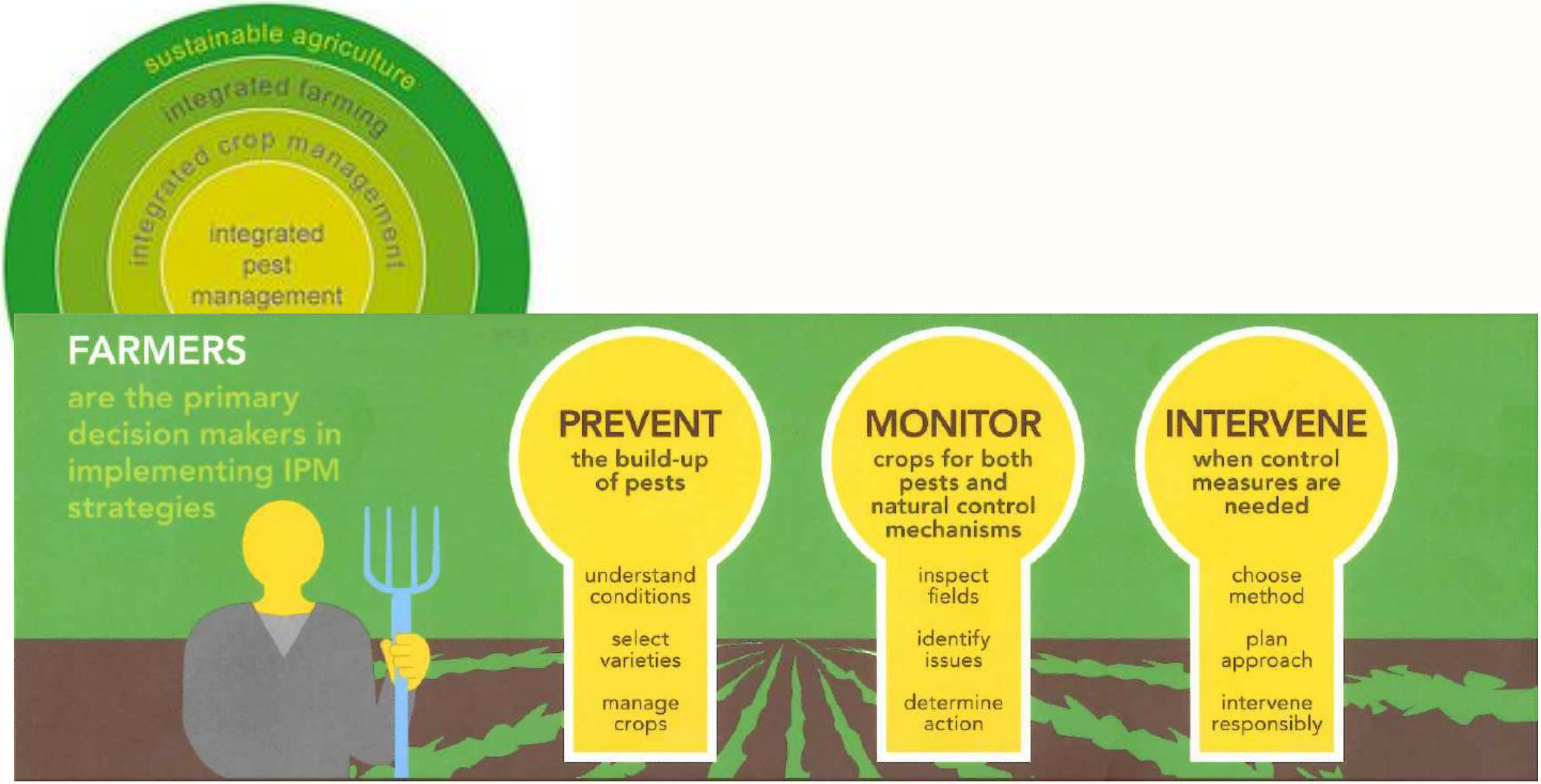
Key Components of an IPM Strategy



Source: ECPA

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IPM and sustainability

How to **continuously improve sustainability** at a successful farming business?

-> possible through an **integrated crop solution** that includes

- high-quality **seeds**
- high-quality crop protection **products**
- customer-tailored **services**

Integrated crop solution for potatoes

PRODUCTIVE, PROFITABLE AND ENVIRONMENTALLY FRIENDLY

Our farms should produce profitable potatoes by means of:

1. maintaining soil fertility

2. reducing soil erosion

3. using certified, healthy seed potatoes

4. following the principles of pest and resistance management

5. minimizing the side effects of farming practices on the environment

6. harvesting and storing potatoes to preserve their high quality

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1. Maintaining soil fertility

Fertile soils with high water-holding capacity provide the basis for high-yielding potatoes

- Soil fertility should be maintained through **three to four-year crop rotation** and by applying **green manure crops** to add and fix nutrients to the rooting zone (e.g. yellow mustard).

- Crop rotation is needed in order to prevent potatoes against nematodes

- Green manure crops are often **good nutrition for bees in autumn**, just before their overwintering. Yellow mustard is by far the best.

- Be sure to **plant the potatoes on the right moment**, depending on soil and weather conditions (April)

- Potatoes are a high-yield crop and consequently need **optimum nutrition**. Dressings of phosphate, potassium, and nitrogen are adjusted to support an excellent yield potential of marketable potatoes.

  -> Ideally, the nutrient demand of the potato crop is monitored through soil sampling before planting.

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Picture: Phytofar

2. Reducing soil erosion

Some soil types, e.g. loss soil, tend to be sensitive to water erosion, especially before canopy closure.

Picture at Hof ten Bosch, Huldenberg, August 2011

2. Reducing soil erosion

With micro-dams

Without micro-dams

With micro-dams

Picture at Hof ten Bosch, Huldenberg, August 2011

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2. Reducing soil erosion

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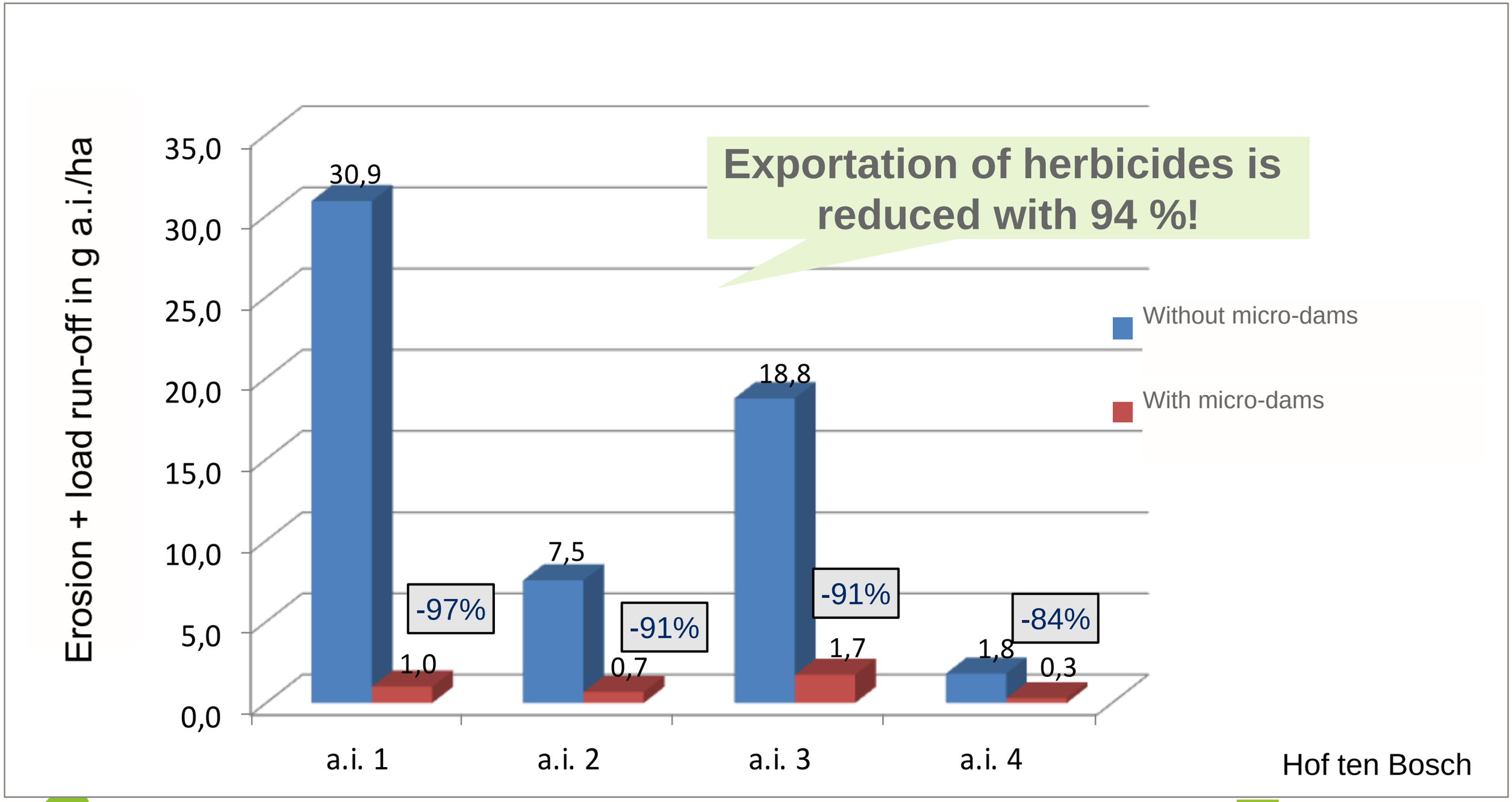

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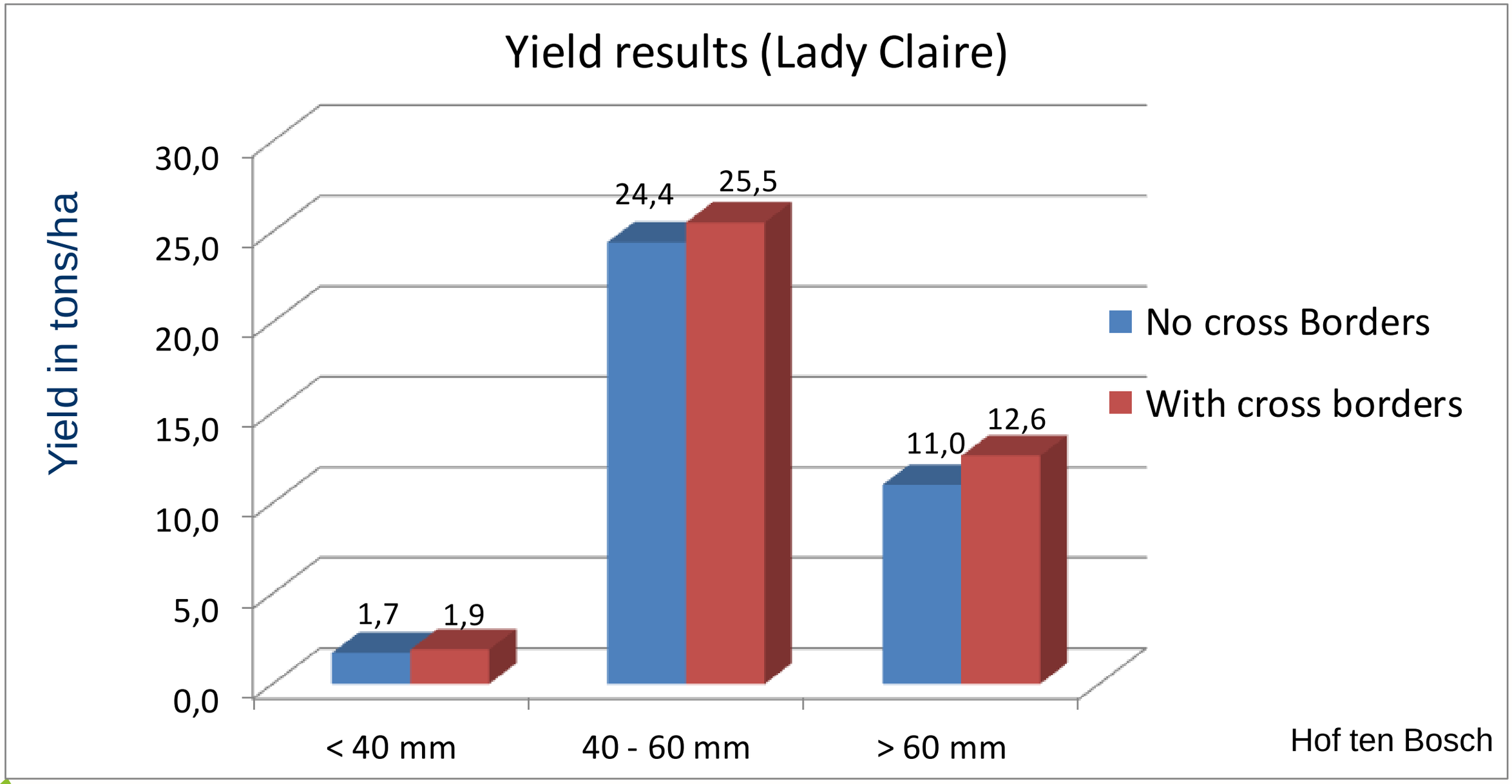
2. Reducing soil erosion



Total yield increase of 2,9 t/ha (treated vs non treated)

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3. Certified, healthy seed potatoes

Certified healthy seed potatoes that are **free from virus and bacterial diseases** are the basis for maximizing the transfer of solar energy into carbohydrates and high-yield potatoes

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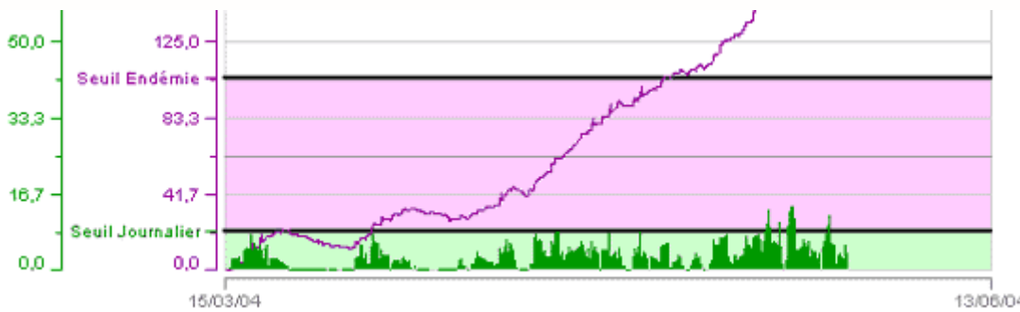
4. Pest and resistance management

Phytophthora is a fungal pathogen that can have a devastating impact on yields if it is not managed in good time and by sophisticated means



->The type of fungicide is adjusted to the crop stage, weather conditions, and the presence of the disease

Pictures: Phytofar; PCA, Hof ten Bosch

4. Pest and resistance management

N° of A.S. In BE	Potato
Insecticide	**19**
Fungicide	**26**
Herbicide	**18**

•To protect the crops against diseases and resistance, it is crucial to use **fungicides with different mode of actions** and co-formulations.

•IPM also requires to apply a fungicide that prevents the development of ***Phytophthora* in both leaves and tubers**. By doing so, the farmer prevents the transfer of the disease from field to storage, protecting and maintaining the high quality of the potatoes during their long storage period.

•Harmful insects are usually only a minor issue in potatoes. A foliar application with an **insecticide** non-hazardous to pollinators, can only be applied if the threshold for aphids or Colorado beetles is exceeded.

•**Herbicides** are generally only used once in the beginning of the season.

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5. Minimizing the side effects of farming practices on the environment

The impact of farming practices on the environment (water, bees, neighbours, neighbouring crops) should be limited.

- **Read the label** of the crop protection products carefully and always follow the guidelines, e.g. never spray an insecticide when bees are foraging

- Focus on **reducing surface erosion** through the use of micro-dams, conservation tillage and anti-erosion techniques at planting and ridging

- Focus on **reducing drift** by using low drift nozzles in combination with applications at low-wind speeds guided by local weather forecasts

- Make use of **precision farming and GPS navigation** to ensure accurate application and prevent any overlap during application. It can deliver savings of 4% in the use of fertilizers and crop protection products.

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6. Harvesting and storing potatoes to preserve their high quality

- Harvesting high-quality potatoes is dependent on a firm skin to prevent damage and the potential entry of fungal and bacterial diseases. **Skin setting** can be enhanced through the use of a chemical desiccation.

- About 2–3 weeks after desiccation, potatoes are mechanically **harvested** in dry weather conditions at soil temperatures of above 15 °C.

- To prevent bruising, potatoes are handled gently and then graded and **stored** in a well-insulated storage room at 4 °C. The storage period can last up to 8–9 months after harvest.

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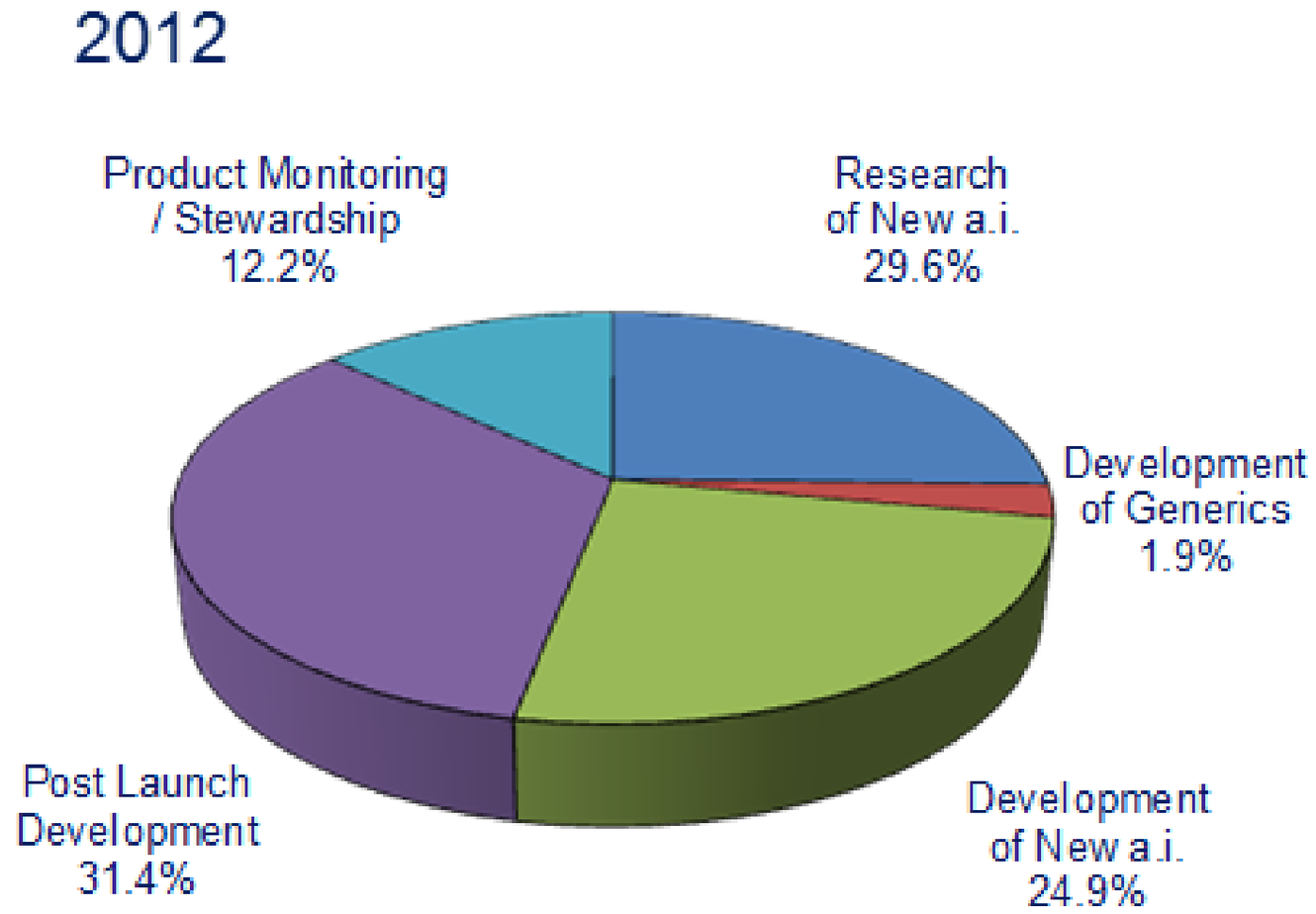
Investments to maintain existing products on the market

A major (and growing) part of the R&D budget is invested in further development, optimization and support Post Launch and Stewardship of existing products and solutions



Total = $2,943 million

(Source: Phillips McDougall - 2012)

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Phytofar : focus and actions in 5 domains

Health

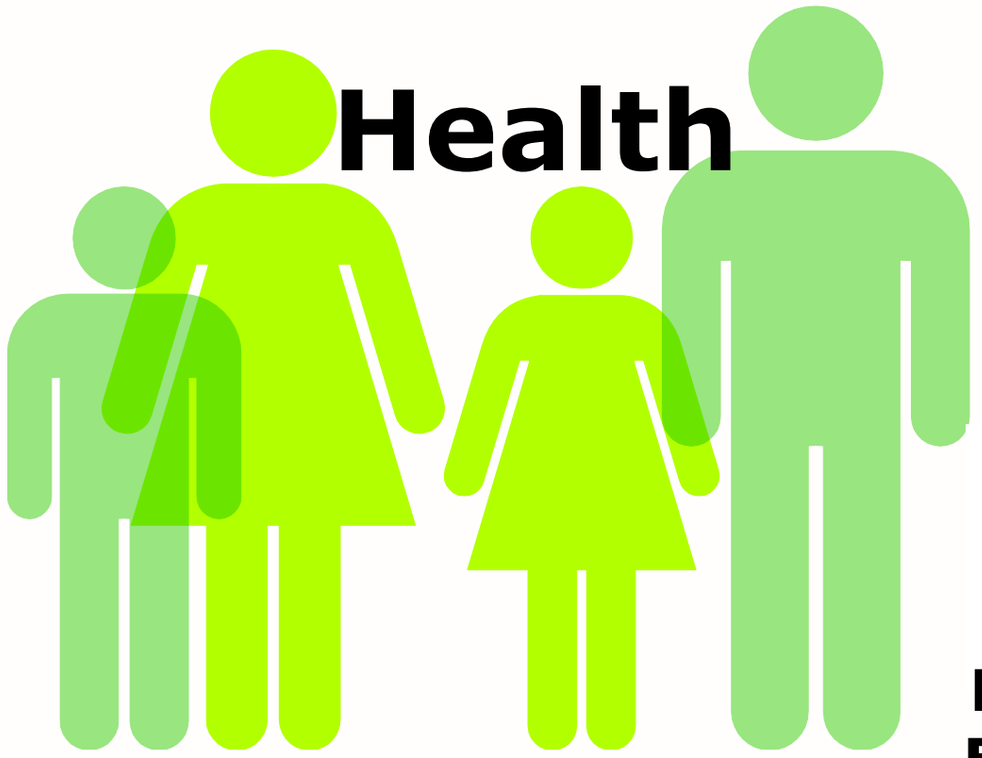
Food

Resource Efficiency

Water

Biodiversity

Phytofar : focus and actions in 5 domains

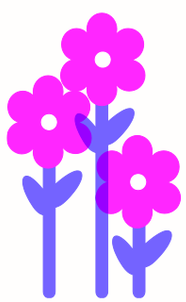


Health

Food

Resource Efficiency

Water



Biodiversity

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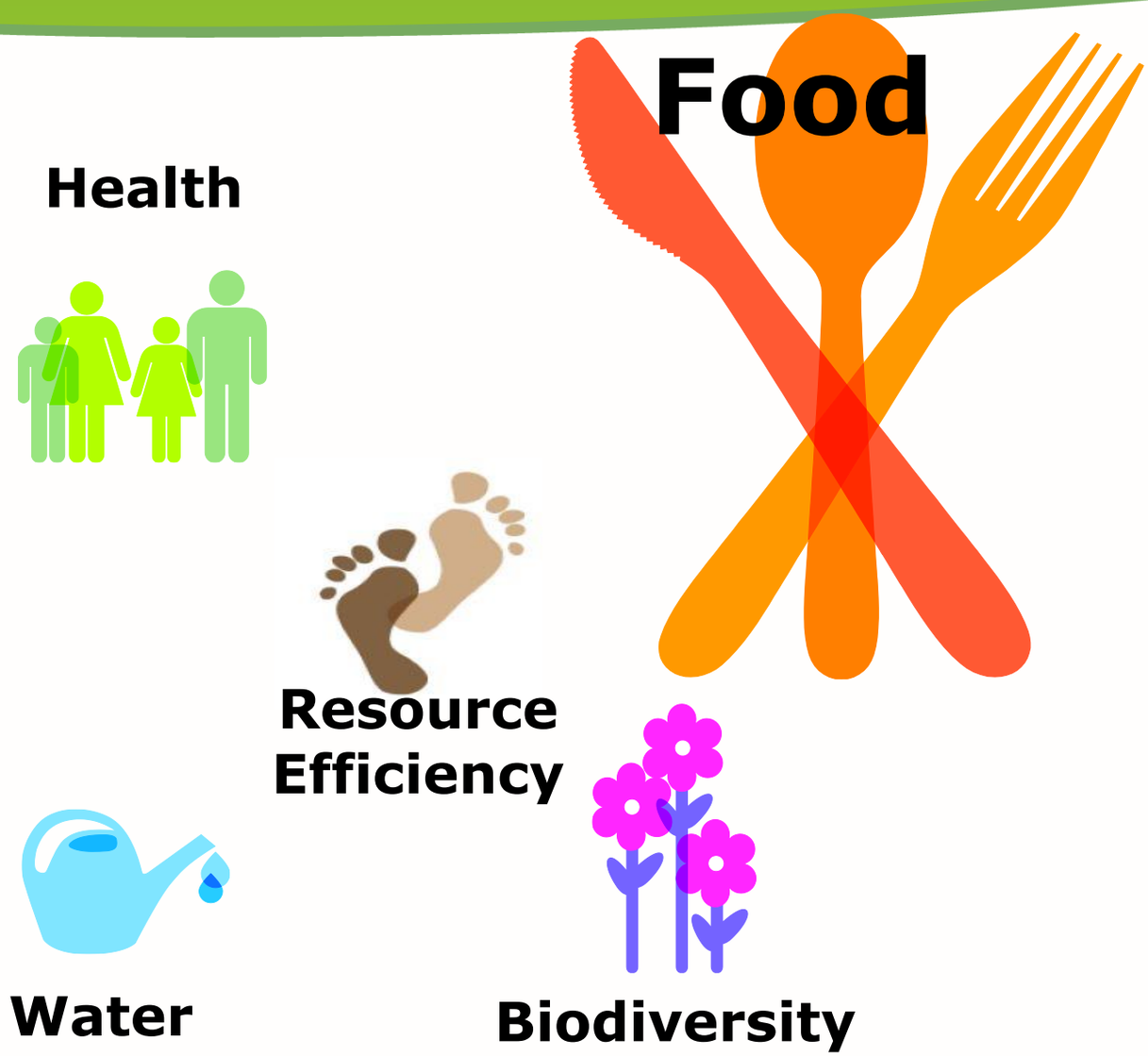
How to safeguard farmer's health and the environment

Besides the abovementioned specific IPM measures for potatoes, some general advices are listed up to protect farmer's health and the environment, and to encourage biodiversity on the farm.

1. Personal protective equipment

-> wear suitable protective clothing during handling and application!

Phytofar : focus and actions in 5 domains



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Residues - MRL (Maximum Residu Limit)

In potato, over 99% of the samples are consistent with MRL (EFSA 2011).

Year	Samples below LOQ	Samples with measureable residues below MRL	Number of samples exceeding MRL	TOTAL
2011	75,8 %	23,6 %	**0,6 %**	1449 samples

Processed food: No exceedence of MRL in potato (EFSA 2013)

Belgian MRL results (2013): 100% conformity

Origin of Potato	Number of Samples	Number of samples with residues above the reporting level (LOQ)	Number of samples exceeding MRL	percentage of samples below the MRL
Domestic	40	27	0	**100**
EEA	24	19	0	**100**
Third Country	7	2	0	**100**

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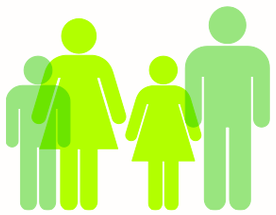
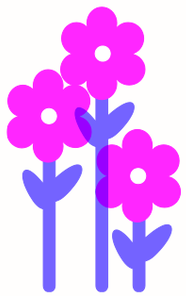
Phytofar : focus and actions in 5 domains

Health

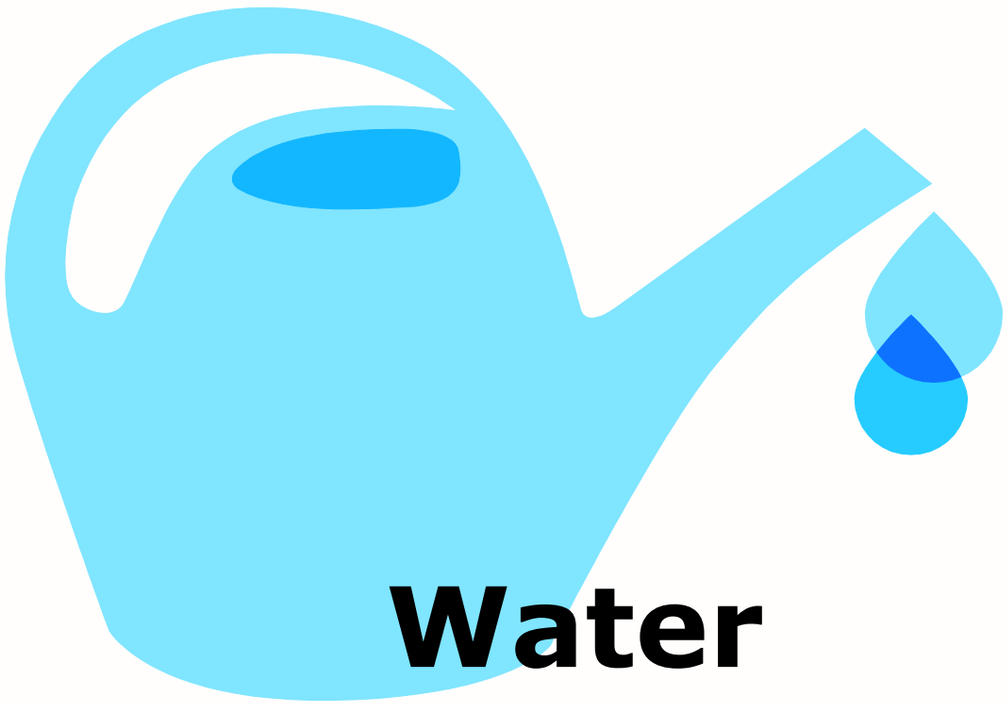


Food

Resource Efficiency



Biodiversity



Water

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How to safeguard farmer's health and the environment

2. Managing rest water from spraying applications

The risks of contamination of the aquatic environment by crop protection products are predominantly related to handling issues during sprayer filling and washing operations.

-> Make use of a (bio)remediation system!

Phytobac

Biofilter

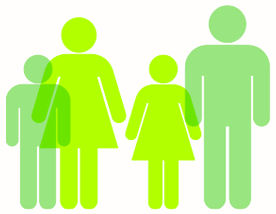
Heliosec

Sentinel

Pictures: Phytofar and Syngenta

Phytofar : focus and actions in 5 domains

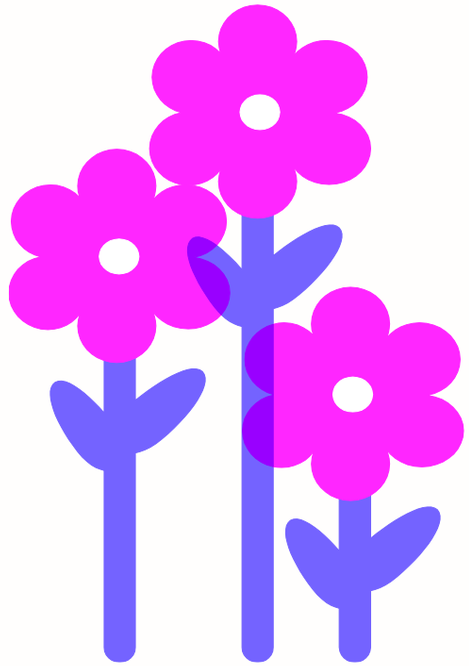
Health



Food

Resource Efficiency

Water



Biodiversity

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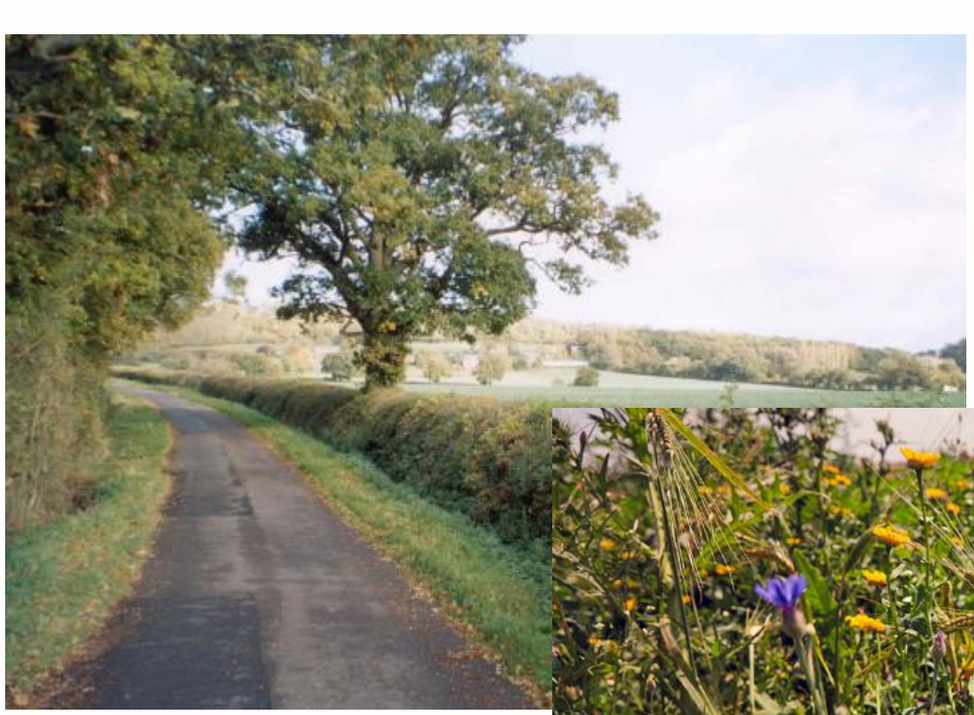
How to safeguard farmer's health and the environment

3. Increasing biodiversity

Mixed hedges and flowering strips along the fields provide continuous flowers and pollen from January to October, creating a reservoir for beneficial insects and pollinators.

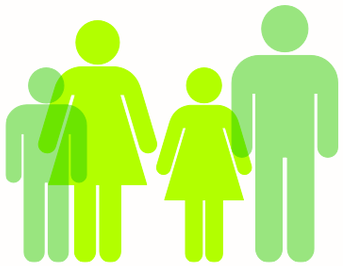
Nesting boxes (mainly in fruit) for small birds that control codling moth by eating the caterpillars; and nesting places for larger predatory species, such as falcons, buzzards, or owls that feed on the rats and mice that can damage fruit trees.



Pictures: Phytofar and Bayer CropSCience

Phytofar : focus and actions in 5 domains

Health



Food

Resource Efficiency

Water

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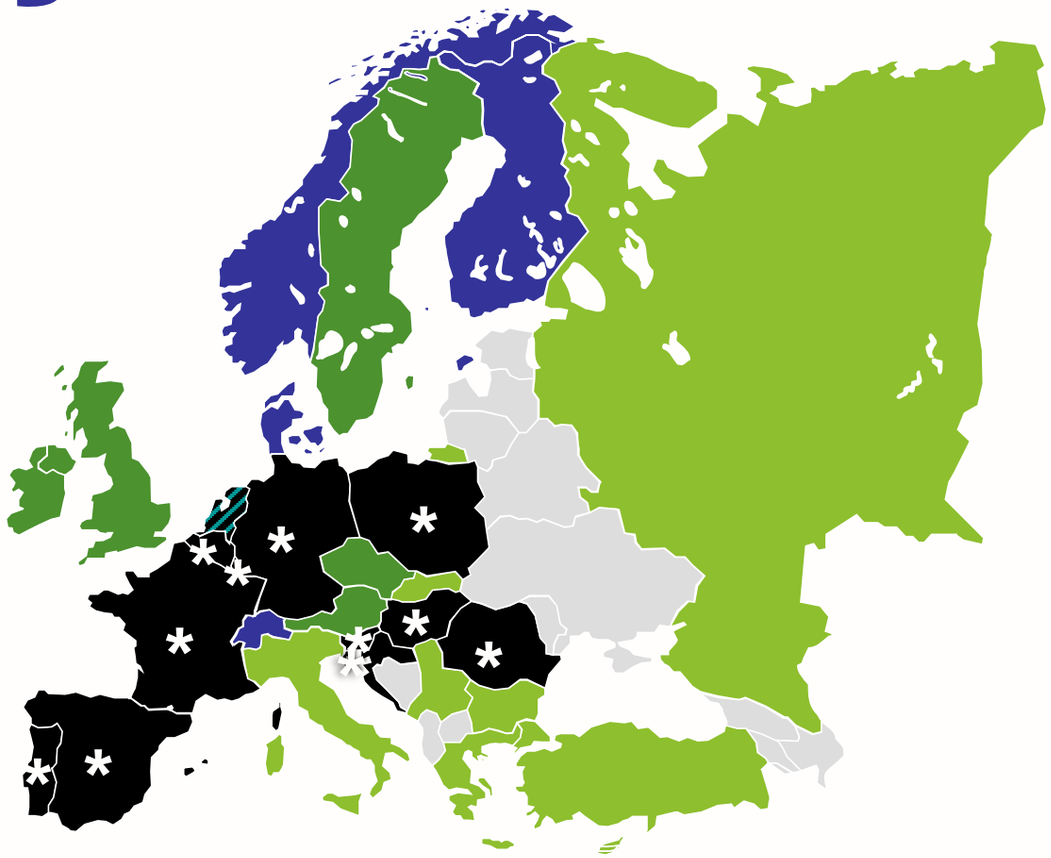
Container Management Systems (CMS)

1. Nationwide industry run collection and disposal system
2. E10 countries covered by annual ECPA statistics
3. Nationwide collection and disposal system, joined by industry
4. Pilot projects start-ups in 2013 for collection and disposal system
5. National waste collection and disposal system run by municipal authorities



RINSE

bonus holsystem

SIGFITO

Farm Plastics Recycling

SLOPAK ŽIVIMO Z OKOLJEM.

valorfito

PAMIRA

SCAPA

STORL VERPAKKING

Phytofar Recover

CSEBER csomagolóeszköz begyűjtési rendszer

svepRETUR SVENSK ENSILAGEPLAST RETUR AB

CROCPA EKO MODEL

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Conclusions

Integrated potato growing reflects the **integration of research and modern technology** into the rich tradition of potato farming.

By **combining different techniques** and by following in-depth advice, the average yield of potatoes can amount to a high yield / ha (40-50 t/ha).

We as crop protection industry fully support IPM

- **right product on the right place**
- **anti resistance management**
- **reduce possible risks for human health and environment**
- **optimal usage of different inputs (fertilizers, water,…) by protecting the plants in order to realize a sustainable production and a sustainable farm income**
- **best guarantee on a flourishing potato production in Europe on the long term!**

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Thank you for your attention!

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