Overview of EU-funded project BIOCOMES: Developing new biological control products for IPM in agriculture and forestry

IPM INNOVATION IN EUROPE
Poznan, 14-16 January 2015

Jürgen Köhl

BIOCOMES
New biological control products
for sustainable farming and forestry

www.biocomes.eu

BIOCOMES objectives

- To support the implementation of Directive 2009/128/EC on use of IPM in agriculture and forestry
- To develop 11 new biological control products for use in IPM and 2 new production technologies

Early testing of the new biological control products by IPM networks outside BIOCOMES is envisaged to allow their rapid implementation in IPM

BIOCOMES consortium

- 13 industrial partners
  - Production and marketing of BCAs: 6
  - Evaluation of risk and sustainability of BCAs: 2
  - Field testing of BCAs: 5
- 14 research institutes and universities
- In 14 countries
- DLO (Wageningen UR): project coordination & communication
- Duration: 48 months; Start: 1 December 2013

BIOCOMES – The choice of targets

- Impact on implementation of Directive 2009/128/EC on use of IPM in agriculture and forestry
- Impact on pesticide use
- Huge markets
- BCAs for open field crops including arable crops
  - Arable crops: 3 BCAs
  - Vegetables: 3 BCAs
  - Fruit tree crops: 3 BCAs
  - Forestry: 3 BCAs
- New production technologies: 2

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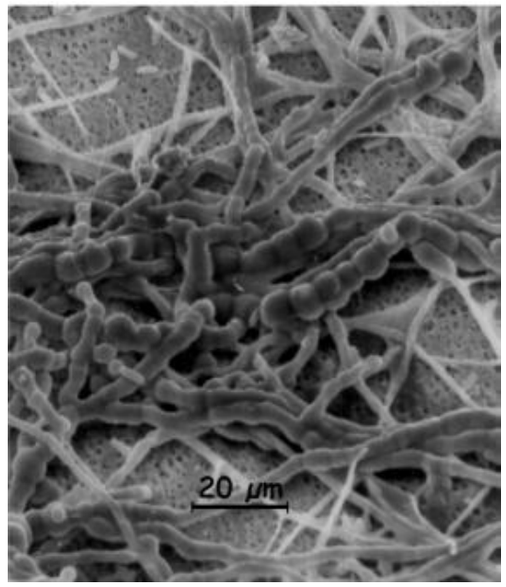
Arable crops - Oilseed rape - Diseases

Verticillium dahliae,
V. longisporum
Verticillium wilt

Serratia plymuthica
Paenibacillus polymyxa



Agro Plantarum
Mariann Wikström

e-nema®

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SUSTAINABLE SOLUTIONS

WAGENINGEN UR
For quality of life

Arable crops - Cereals - Diseases

Toxigenic *Fusarium* spp.
Pink ear rot in maize
Head blight in wheat

Trichoderma harzianum
Strain DSM 25764

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WAGENINGEN UR For quality of life

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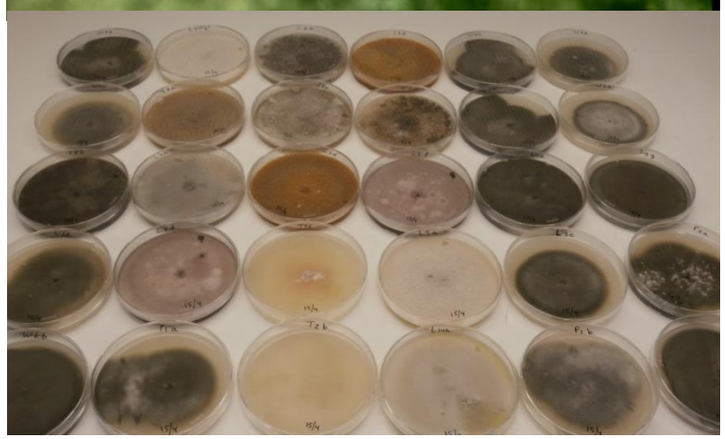
Arable crops - Cereals - Diseases

Blumeria graminis
Powdery mildew

New screening of
fungal antagonists



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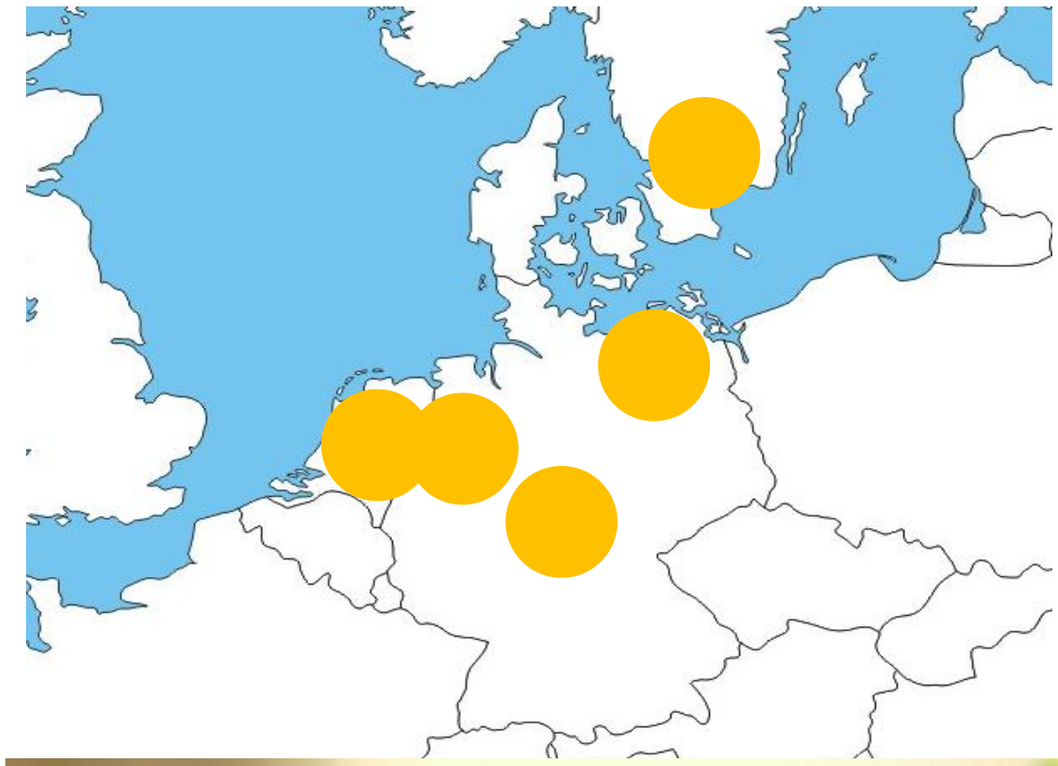
Sampling of powdery mildew pustules

- Leaves of various plants with powdery mildew pustules
- Collected by DLO, AGPL and BCSB
- March – July 2014
- Sent to DLO for isolation of fungal colonizers



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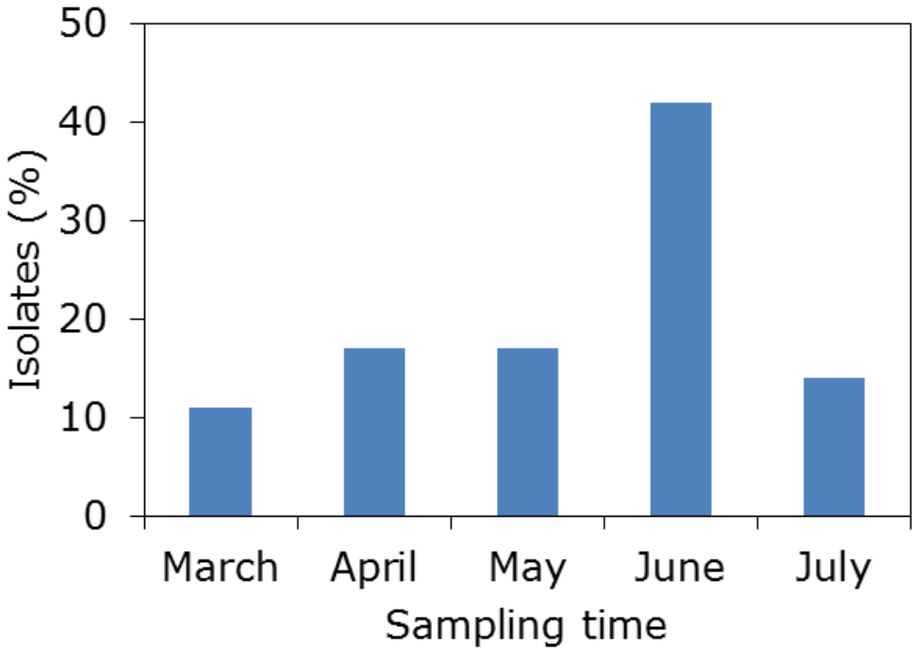
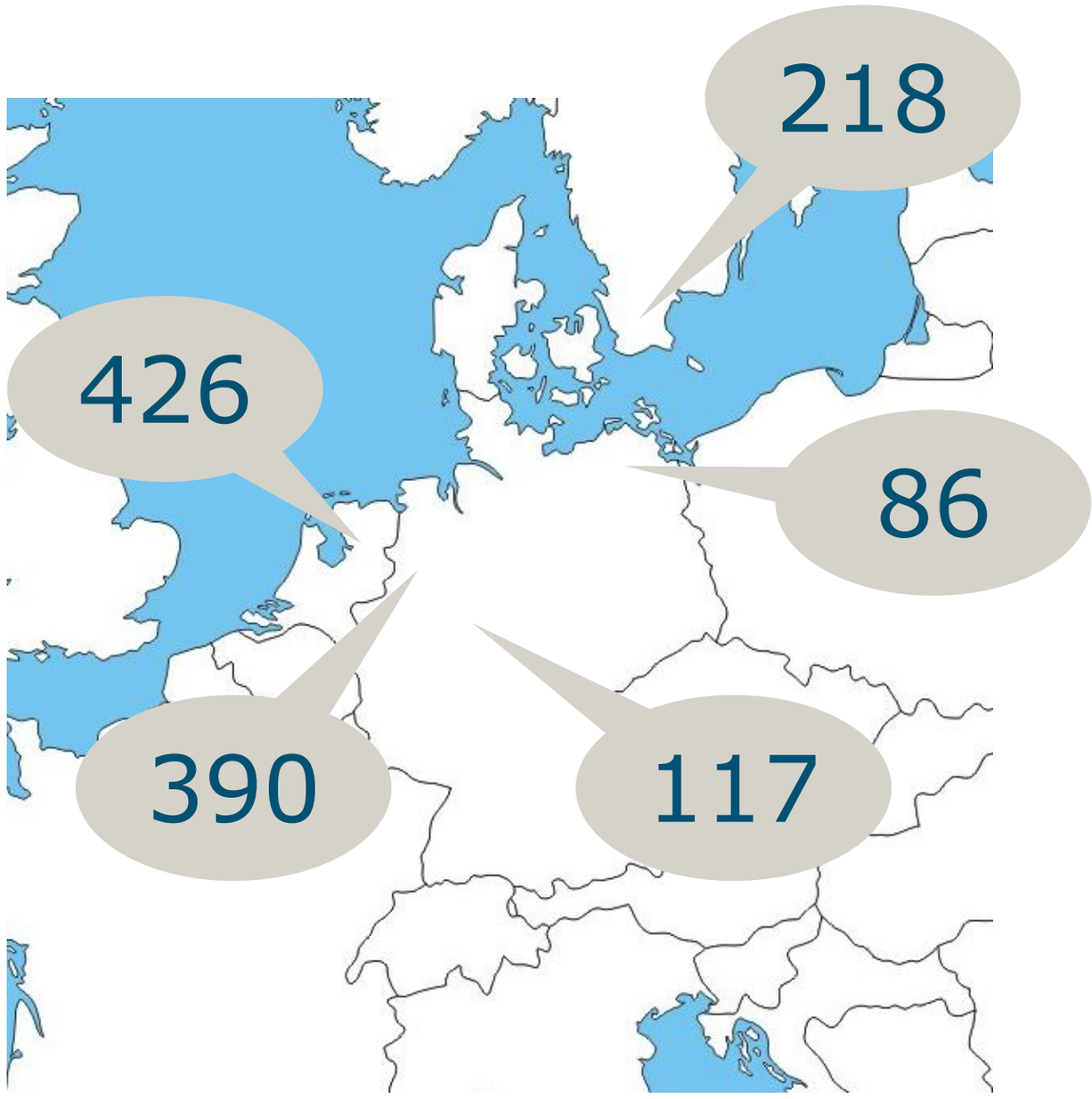
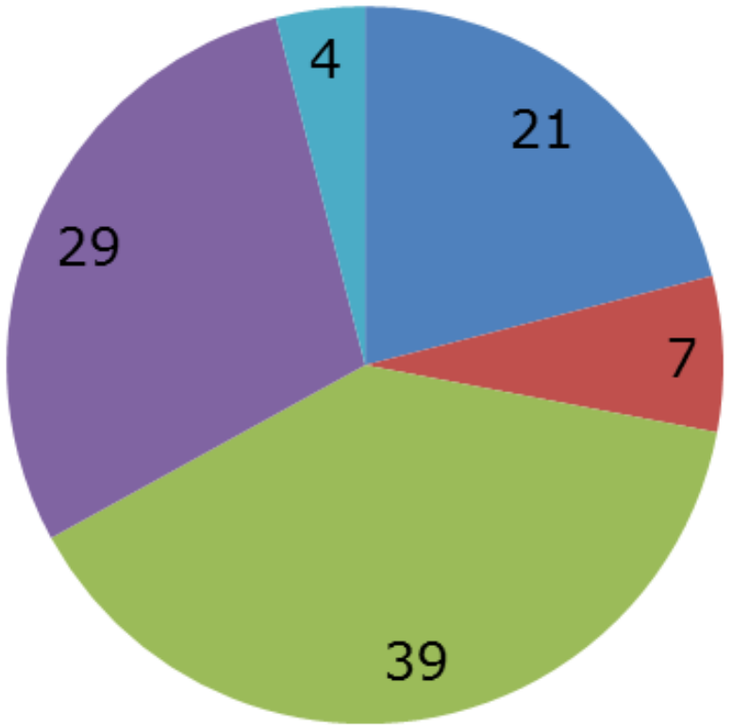
Origin of fungal isolates from powdery mildew pustules

- 504 powdery mildew samples collected
- 1237 pure cultures of fungal isolates obtained





Origin of fungal isolates (%) from different hosts

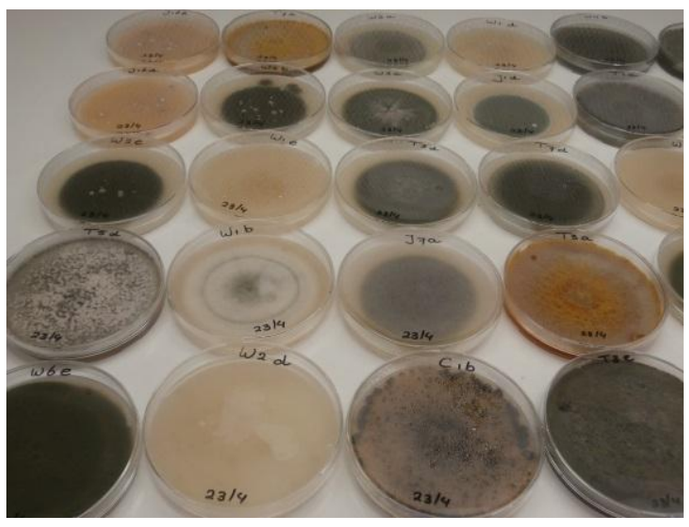


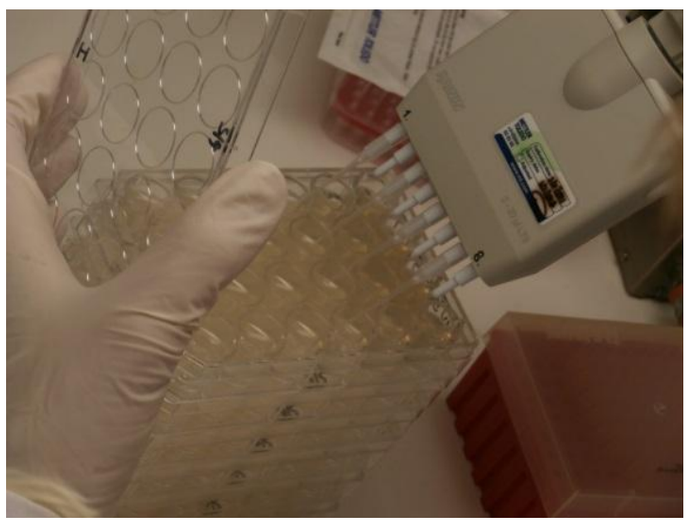
Blumeria graminis

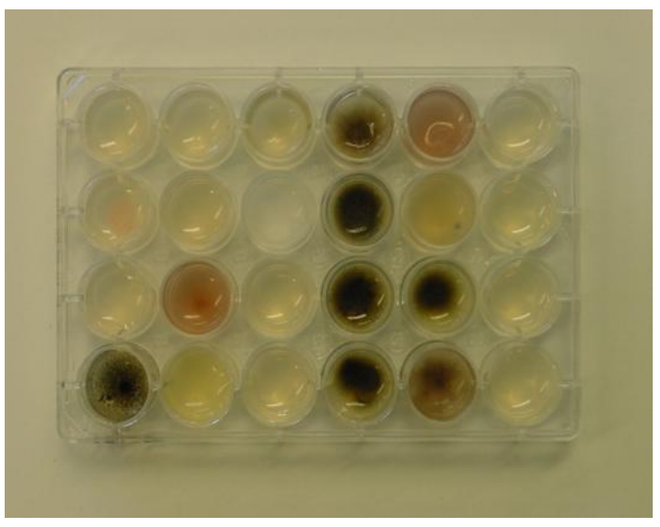
Various powdery mildew species

Pre-screening: Selection criteria

- Mass production: >1 x 10^5 spores per agar plate
- Safety: no growth at 36°C
- Cold tolerance: germination and growth at 5°C
- Drought tolerance: germination and growth at -7 MPa and -13 MPa (equal to a_w=0.95 and a_w=0.91)
- UV-B resistance: growth after 1 W m^{-2} / 4 W m^{-2} for 8 hrs on 7 days







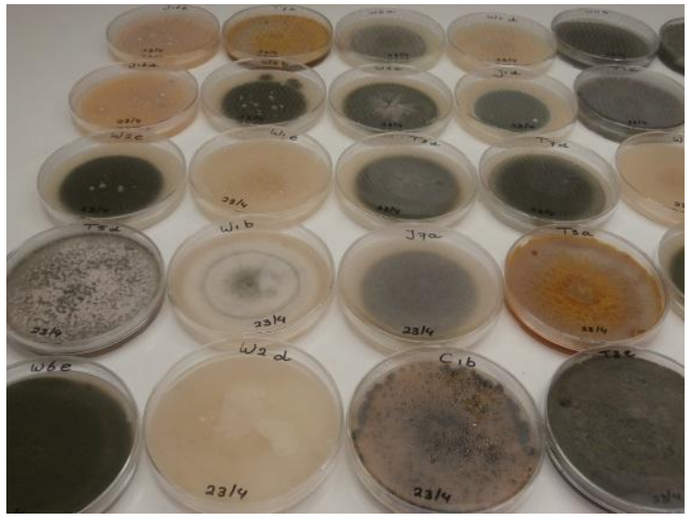
Antagonist screening

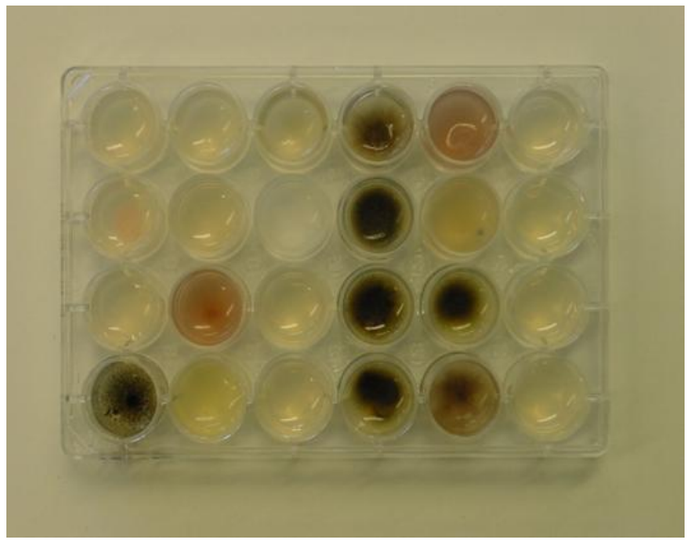
Pre-screening of 1200 fungal isolates

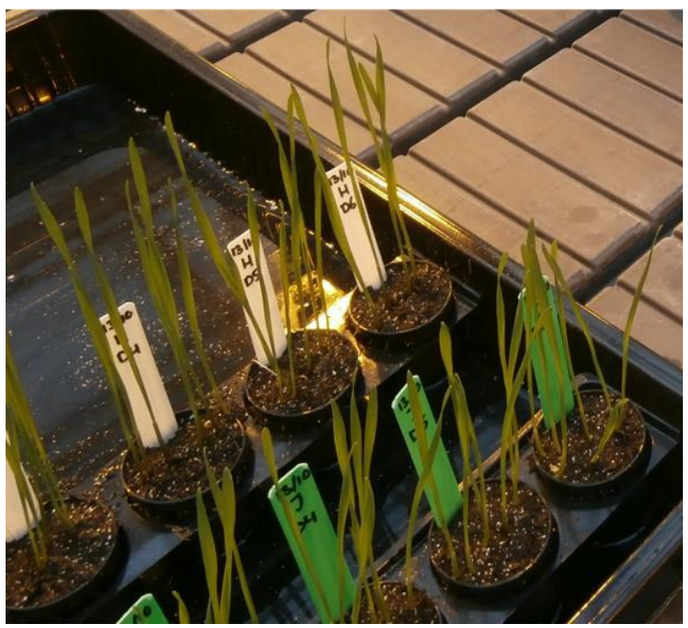
Identification

Preliminary risk assessment

Efficacy testing in bioassays







Vegetables - Brassicas - Pests

Mamestra brassicae
Cabbage moth

Telenomus sp.

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ARA
Sperimentazioni in Agricoltura

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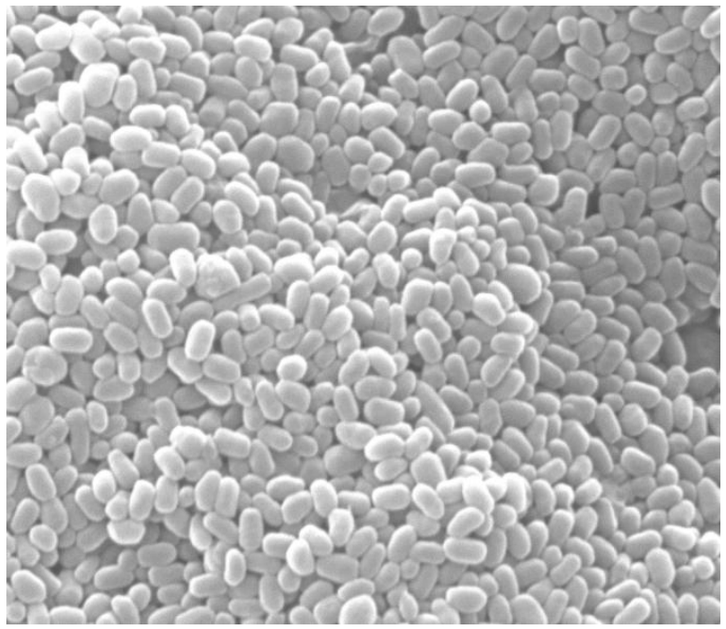
Vegetables - Solanaceae - Pests

Tuta absoluta
Tomato leaf miner
Phthorimaea operculella
Potato tuber moth

PhopGV
baculoviruses



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hellafarm S.A.

JKI Julius Kühn-Institut

upna Universidad Pública de Navarra Nafarroako Unibertsitate Publikoa

Vegetables - Pests

White flies

Isaria fumosorosea

Fruit tree crops - Pests

Aphids of apple, plum, pear, peach, apricot, cherry

Parasitoids

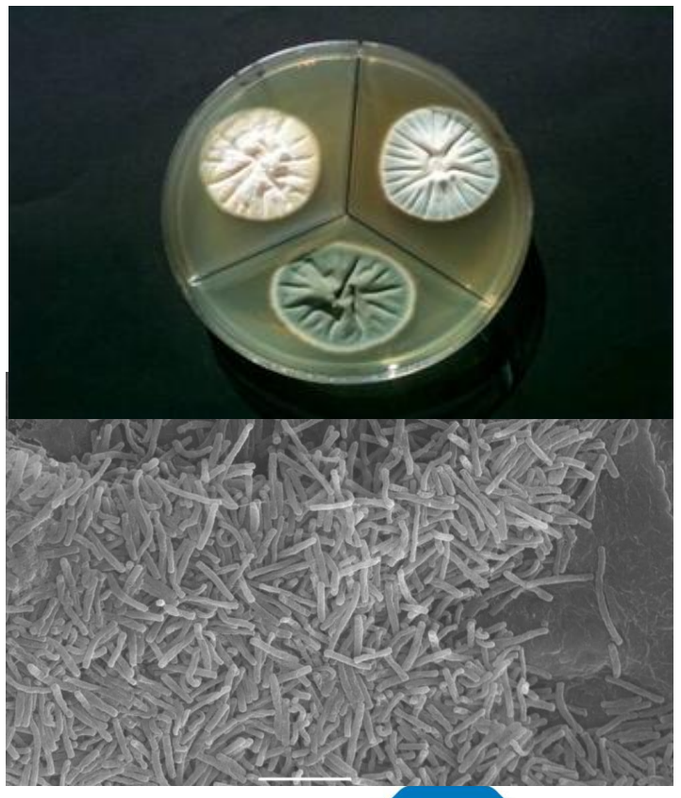
Viridaxis

pcfruit
PROEFCENTRUM FRUITTEELT VZW

Fruit tree crops - Stone fruits - Diseases

Monilinia spp.
Brown rot

Penicillium frequentans 909
Bacillus subtilis CPA-8



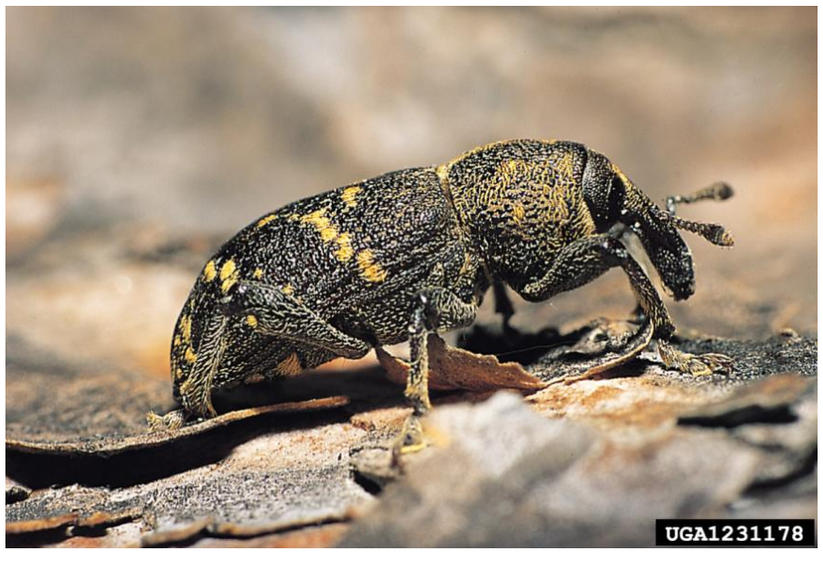
Forestry – various tree species - Pests

Lymantria dispar
Gypsy moth

LdMNPV
Baculovirus

Forestry - Conifers - Pests

Hylobius abietis
Large pine weevil



Entomopathogenic nematodes

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NUI MAYNOOTH
Ollscoil na hÉireann Má Nuad

Forestry - Nurseries - Diseases

Fusarium, *Phytophthora*, *Rhizoctonia, Pythium*
Damping off

Serratia plymuthica, *Paenibacillus polymyxa*
Trichoderma harzianum DSM 25764

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Production technologies

Entomopathogenic nematodes

Downstream-technology, shelf life and genetic improvement

Production technologies

Entomopathogenic viruses

In vitro production

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JKI Julius Kühn-Institut

Zurich University of Applied Sciences
zhaw Life Sciences and Facility Management

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Welcome to BIOCOMES

The EU emphasizes the role of integrated pest management as an important approach to reduce dependency on pesticides use. Before pesticides are used, biological control measures, together with physical and other non-chemical methods, should have first preference (Directive 2009/128/EC).
The EU is stimulating the development of biological control products by financing this **BIOCOMES** project.

On this website you will find information about:

- The pests and diseases for which **BIOCOMES** is developing biological control solutions
- Why it is important to offer biological alternatives for control of these pests and diseases
- Which biological control products are being developed

Do you want to know more about us? Please go to our About BIOCOMES page.

Diseases

Brown rot
Stone fruit

Read more

Fungal root diseases
Forest nurseries

Read more

Fusarium spp.
Cereals

Read more

1 2

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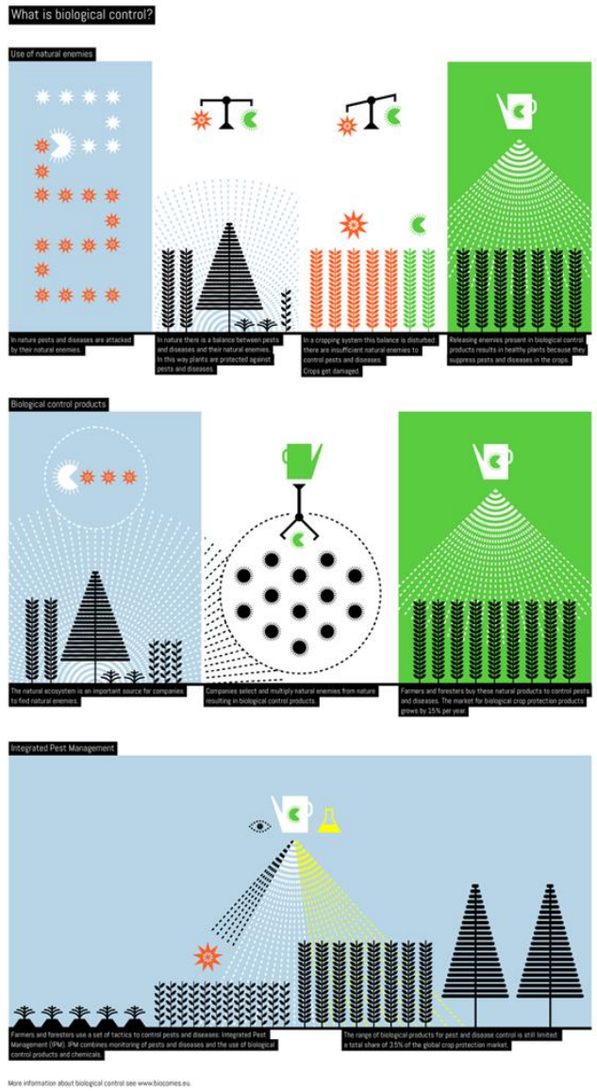
- Offer information about biological control and the contribution of BIOCOMES products → *End users and influencers*
- Raise awareness of the new biological control opportunities and project results of BIOCOMES → *IPM scientists*



BIOCOMES

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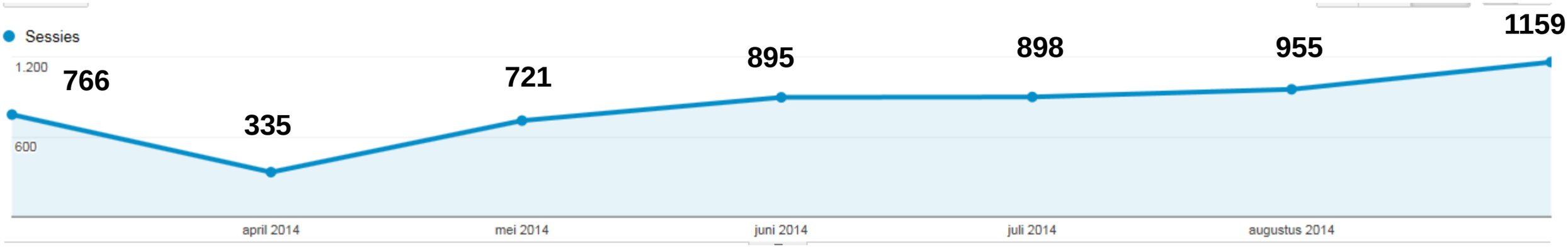
Visits BIOCOMES website
March – September 2014

- Total visits per month (March – September)



- September 2014 1159 visits!
- Average of 3,5 pages and 3:08 minutes per session

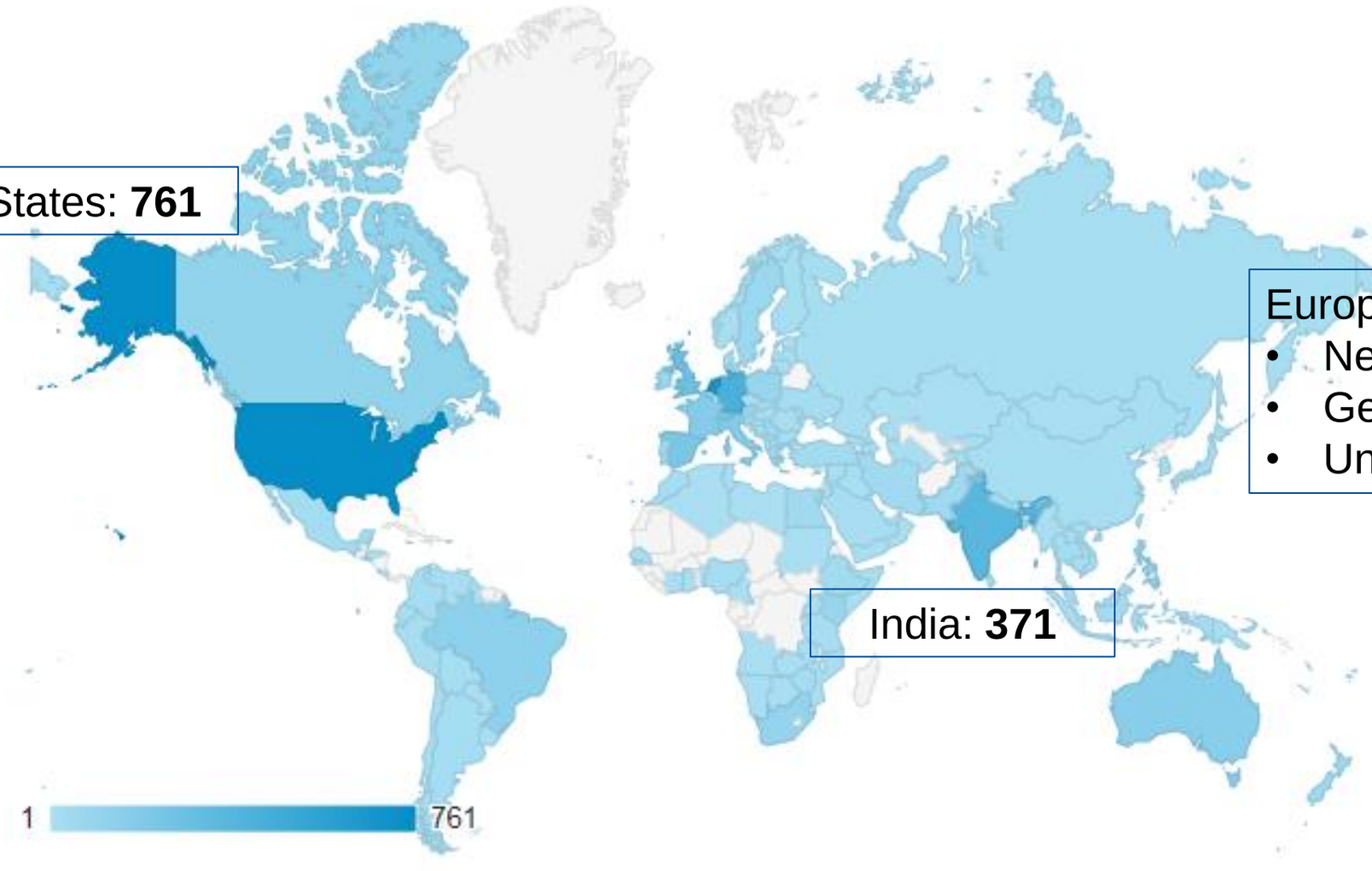
Visits BIOCOMES website
March – September 2014

- Our top 5 visits come from:

United States: **761**

Europe: **2.676**
- Netherlands: 655
- Germany: 438
- United Kingdom**:** 279

India: **371**



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Thank you for your attention

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