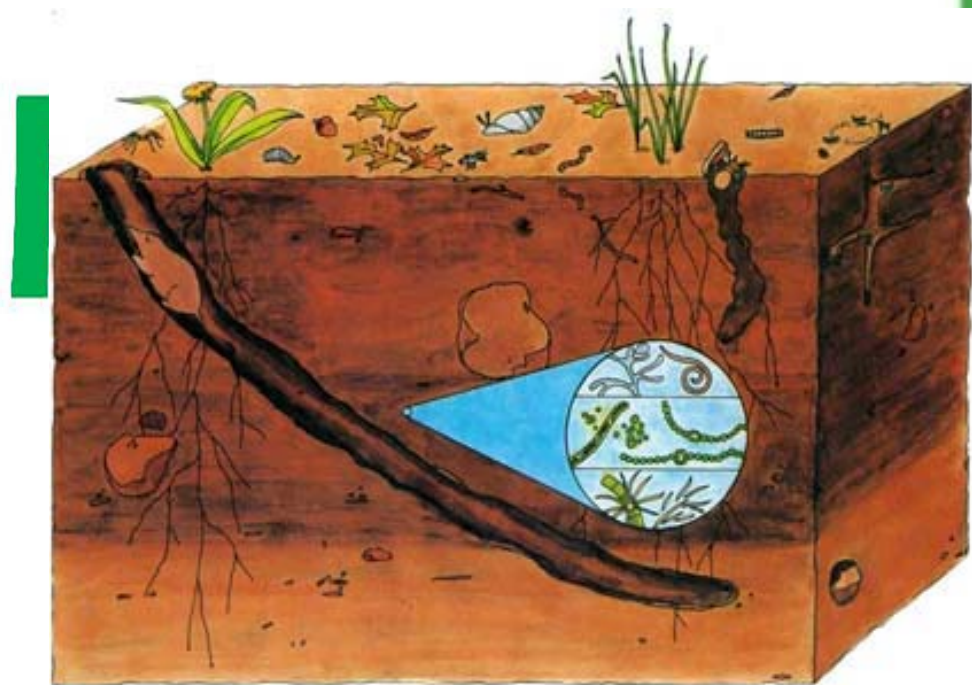


# Effects of Soil Resetting® on plant available nutrients and suppression to various soil-borne pathogens

Salvador Roig-Coll, H. Feil, H. Meints & A. van der Wurff



# SOIL

Background

What is Soil  
Resetting®?

How does it  
works?

# Facts

How do we  
do it?

# NG

# IPM



# Background

- ▶ **Monocropping** agricultural model

**SOIL**

- ▶ Need for alternative methods for controlling **soilborne** plant pathogens

- ▶ Global phase-out of **methyl bromide**

**RESETTING**

- ▶ Human health & environmental concerns of alternatives to methyl bromide



# Background

- ▶ Already present **non-chemical alternatives**

Name	Steaming	Solarization	Biological soil disinfection
<b>Definition</b>	Applying steam to the soil	Heating the soil with the Sun	Release of toxic substances (isothiocyanates, organic acids) by plant material (e.g. Brassica, grass) under anaerobic conditions
<b>+</b>	<ul style="list-style-type: none"> <li>• Good killing rate</li> <li>• High-yield-added-value-crops</li> <li>• Timing</li> </ul>	<ul style="list-style-type: none"> <li>• Cheap</li> </ul>	<ul style="list-style-type: none"> <li>• Cheap</li> <li>• Good disinfection results</li> <li>• Well documented (Shinmura, 2004; Blok et al. 2000; Goud et al. 2004)</li> </ul>
<b>-</b>	<ul style="list-style-type: none"> <li>• Expensive</li> <li>• High energy consumption (5 m<sup>3</sup>/m<sup>2</sup>)</li> <li>• Biological vacuum</li> </ul>	<ul style="list-style-type: none"> <li>• Variable results</li> <li>• High insolation</li> <li>• Timing</li> </ul>	<ul style="list-style-type: none"> <li>• High amounts of OM</li> <li>• Variable properties of OM</li> </ul>

# What is it?

- ▶ Thatchtec BV patented Soil Resetting® in 2009
- ▶ Soil Resetting®, innovative method of BSD
- ▶ Controls a range of soilborne plant pathogens e.g.
  - *Verticillium dahliae*, *Pythium*
  - *Meloidogyne incognita* & hapla, *Pratylenchus penetrans*, Potato cyst nematode
- ▶ Treatment
  - Incorporation defined OM (Herbie®)
  - Control soil moisture
  - Tarping with VIF film during approx. 4 weeks

SOIL  
RESETTING



# What is it?



# How does it work?

- SOIL**
- ▶ Similar to mesophilic anaerobic digester (Smith et al. 2005)
  - ▶ **Stage 1: Oxygen depletion**
    - 0.2% during approx. 1000 hours
  - ▶ **Stage 2: Build up of anaerobic microorganisms**
- RESETTING**

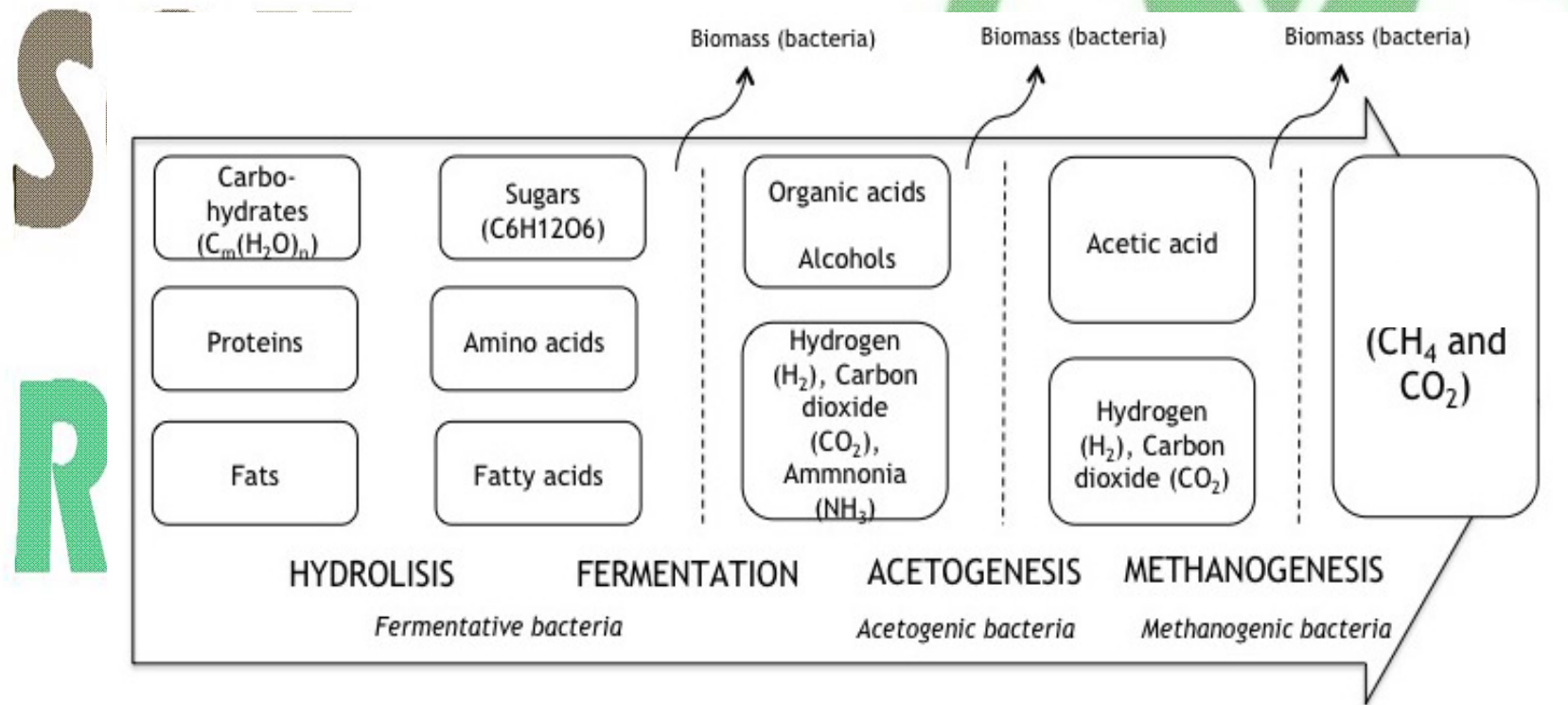
**BODEM  
RESETTEN**





# How does it work?

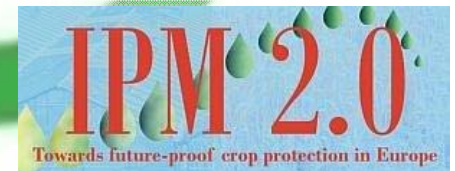
- ▶ Stage 3: Strict anaerobic warfare



# How do we do it?



**BLGG AGROXPERTUS**



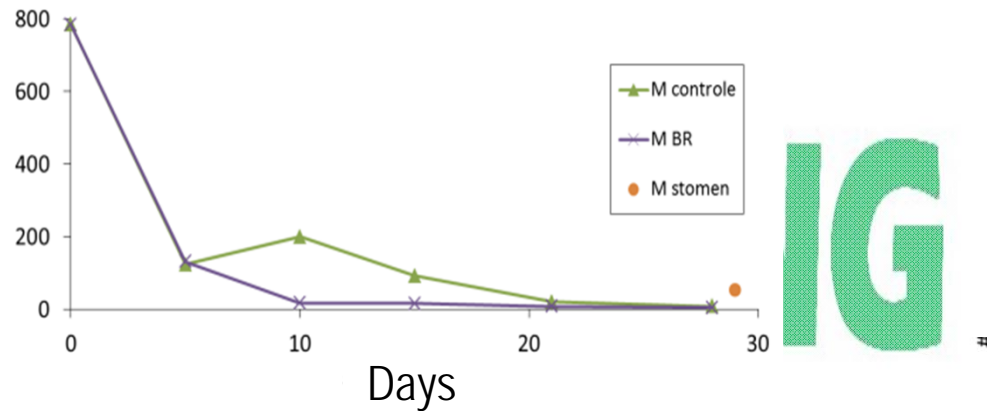
# Facts

- ▶ Up to 100% killing rate in nematodes
  - Nearly all nematodes
  - Verticillium

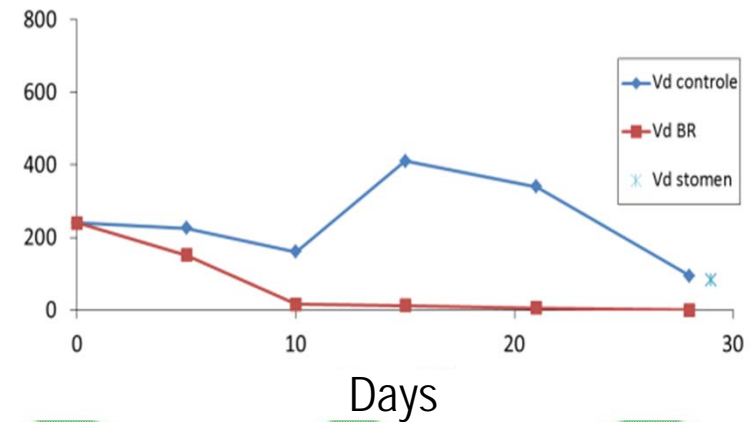
soil



*Meloidogyne spp.*



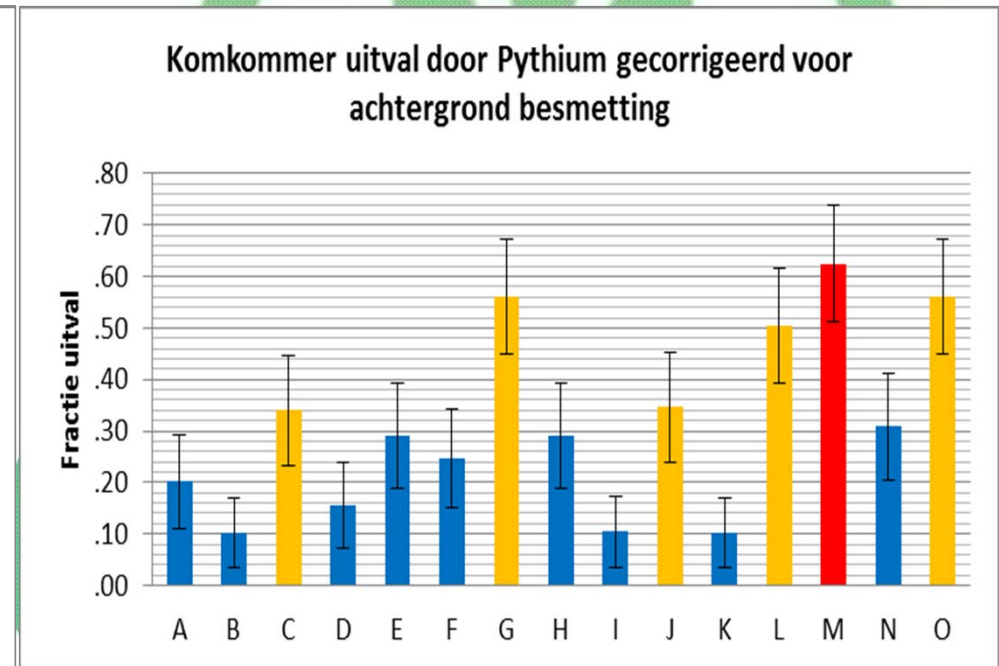
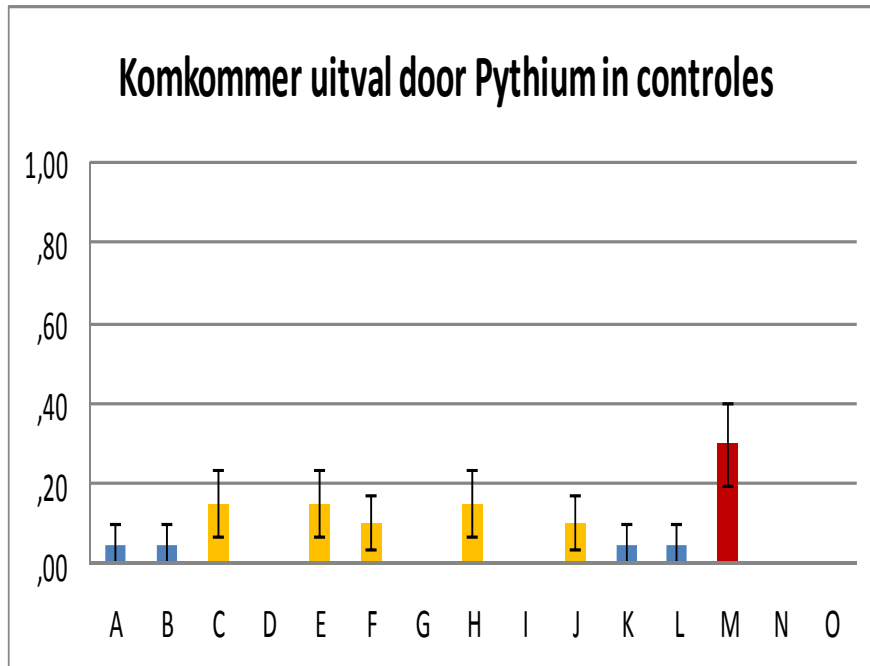
*Verticillium dahliae*



Source: Ludeking et al. (2012)

# Facts

## ► Suppressing Pythium influence



Source: van der Wurff et al. (2012)

...but why?

▶ **Immobilisation**

- Good meal to build up soil biological communities
  - Not only C source, but C : N : P : S
  - High digestibility
- Balanced and pro-active development of soil life
  - 1<sup>st</sup> week post-treatment: aerobic bacteria
  - 2<sup>nd</sup> week post-treatment: fungi
  - 8<sup>th</sup> week post-treatment: saprophytic nematodes up to 20,000 / 100 ml soil

▶ **Mineralization**

SOIL  
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# Conclusion

## ▶ General conclusion

- Two birds in one shot: plant pathogens and better plant growth

## ▶ Linking IPM General Principles and **Soil Resetting**<sup>®</sup>

- (1) Measures for prevention and/or suppression of harmful organisms
- (2) Tools for monitoring
- (4) Non-chemical methods to be preferred
- (8) Records, monitoring, documentation and check of success

SOIL

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# Further research

- ▶ New covers e.g. bio-plastics, coatings

**SOIL**  
▶ Inoculating the soil  
▶ H 67 P

**RESETTING**  
▶ Role of different soil microbial communities  
▶ Resistant soilborne pathogens e.g. soilborne Phytophthora



# Follow-up



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