

# Framework and pipeline for evaluating biologicals and alternative solutions

Euroblight working group



**EuroBlight**

A potato late blight network for Europe



# Euroblight working group on biologicals and alternatives



- ↘ Available active ingredients
- ↗ Pathogen population diversity
  - ➔ Fungicide resistance
  - ➔ Overcoming resistance gene

We need more  
tools in the toolbox



*What is the potential of biologicals and alternative solutions?*

*What can we, as Euroblight, do?*

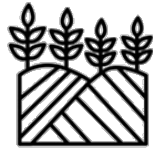
# WHERE ARE THE CHALLENGES – WHICH ONES CAN WE ADDRESS

IDENTIFICATION OF CANDIDATES



Efficacy  
Stability  
Storage  
...

FIELD VALIDATION



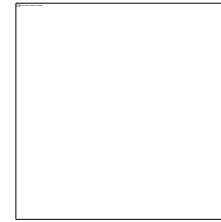
Test protocols  
...

PRODUCTION



Mass production  
Costs  
...

REGISTRATION



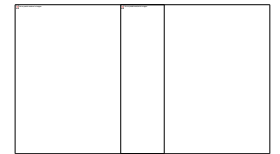
Costs  
...

PRODUCT PLACEMENT



Where to place product  
...

FARMER ADOPTION

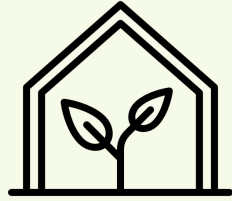


Building of trust  
...

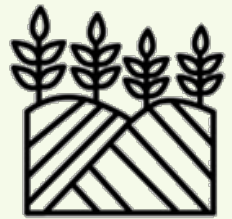
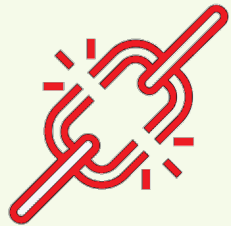
As a scientific community, we can identify the knowledge gaps

As a working group we can:

- Identify and bring together the institutes/groups with the required expertise
- Design and evaluate strategies
- Harmonize protocols



CONTROLLED  
CONDITIONS



FIELD CONDITIONS



Without biological



With biological



Without biological



With biological



# WHAT ARE BIOLOGICALS AND ALTERNATIVE SOLUTIONS?

## PRINCIPLE OF BIOCONTROL



*Exploit  
naturally  
occurring  
phenomena or  
interactions*

## BIOLOGICALS



*Products derived from  
living organisms or  
natural substances*

## ALTERNATIVE SOLUTIONS



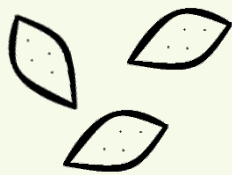
*any strategy reducing  
the dependence on  
synthetic fungicides*

# BIOLOGICALS

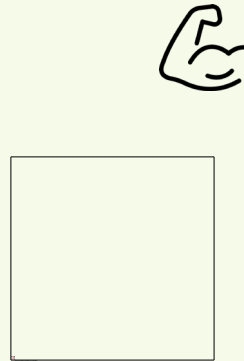


*Nature based*

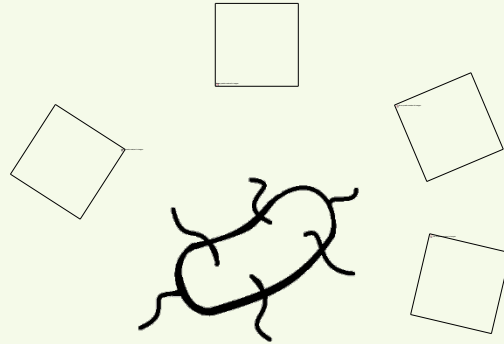
*P. infestans*  
*spores*



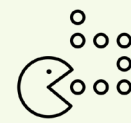
BOOSTING  
PLANT  
DEFENSES



DIRECT ANTIBIOSIS



COMPETITION  
FOR NUTRIENTS  
AND SPACE



PARASITISM

BOOSTING  
PLANT  
DEFENSES



INHIBITION/  
REPELLENT





## ADVANTAGES AND LIMITATIONS OF BIOLOGICALS VS PPPs

	Biologicals	Synthetic fungicides
Direct toxicity	Moderate	High
Mode of action	Multiple	Often single site
Risk of resistance	Mostly low	Higher
Dependance on environment	High	Low
Speed of action	Low	High

Why do we handle them as synthetic PPPs?

# WHAT IF WE THINK ABOUT IT DIFFERENTLY? WHAT DO WE NEED BIOLOGICALS TO DO?

REDUCE AMOUNT OF  
PPPs

Can biologicals replace PPPs when disease pressure is low?

PROTECT ACTIVE  
INGREDIENTS

Can biologicals replace certain applications under precise conditions/at a certain timing?

PROTECT  
RESISTANCE GENES

Can biologicals fill the gap from going without treatment to a fungicide treatment?

CALIBRATE DSS FOR  
LOW PRESSURE  
SITUATIONS

Can biologicals take some pressure of fungicides to reduce spore population size?

Can biologicals delay the first application?

REINFORCE CURRENT DISEASE MANAGEMENT STRATEGIES

# DESIGN A PROTOCOL FOR TESTING THE ADDED VALUE OF BIOLOGICALS WITHIN STRATEGIES

DSS – disease pressure and meteorological conditions

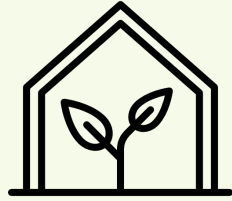
VARIETY – susceptible vs resistant

## BIOLOGICALS

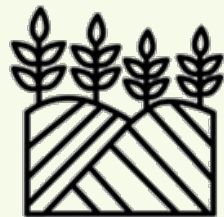
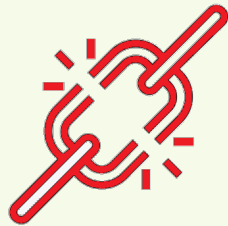


COMBINATIONS – with synthetic fungicides or copper or other biologicals

ADAPT APPLICATION METHOD – in furrow application, early applications



CONTROLLED  
CONDITIONS



FIELD CONDITIONS

## NECESSARY IMPROVEMENTS

### Identification of best candidates

Better understanding of biological MoA and requirements



### Formulation and Delivery Technology

Improving biocontrol product stability, shelf life, and robustness through advanced formulation and delivery technologies

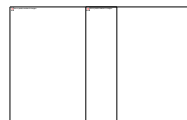


### IPM – Integrating biocontrol in control schemes

Apply according to disease pressure and together with other control methods

### Digital and Precision Agriculture

Adapt decision support systems to optimize biocontrol application and reduce unnecessary treatments



### Proof of concept

Demonstrate the added value of biologicals in disease management strategies

Do you want to join or share ideas?



All ideas, thoughts, suggestions, questions,  
requests are welcome!

Thank you for  
your attention

