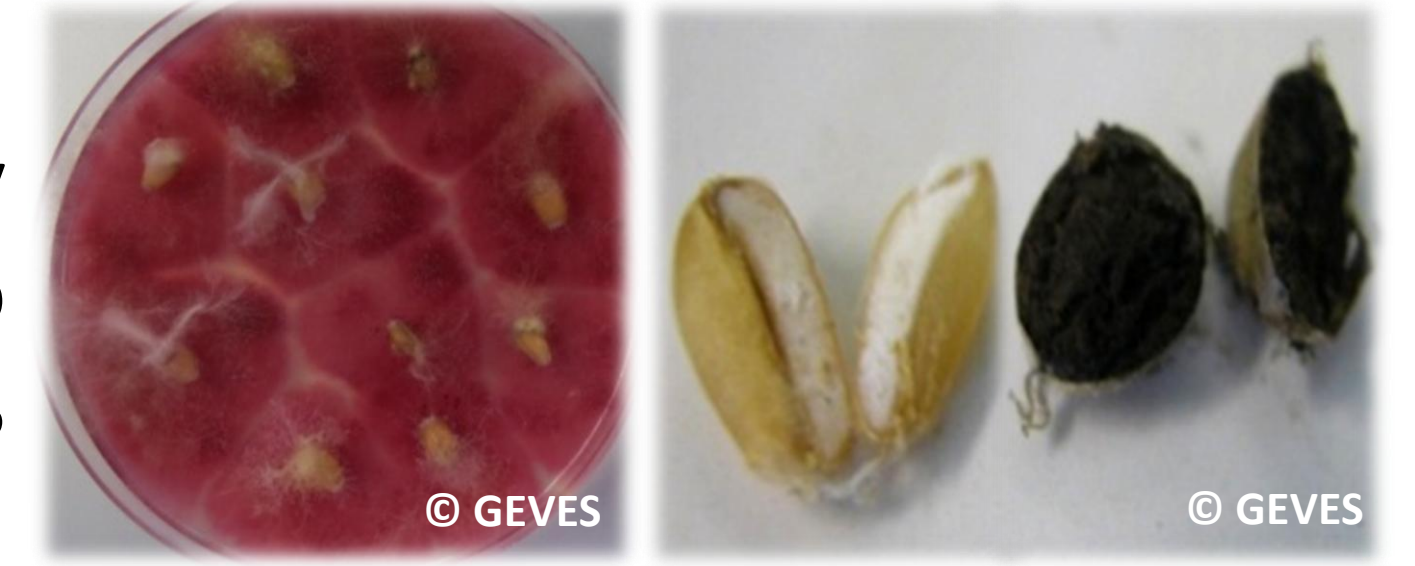


## INTRODUCTION

To achieve one of the objectives of the Ecophyto plan, which is to reduce the use of chemical products, many professionals in the sector are currently developing new alternative seed treatment methods. To be able to evaluate the efficiency of these treatments, tools have been developed in the pathology laboratory of GEVES in order to meet the needs of the solutions providers.



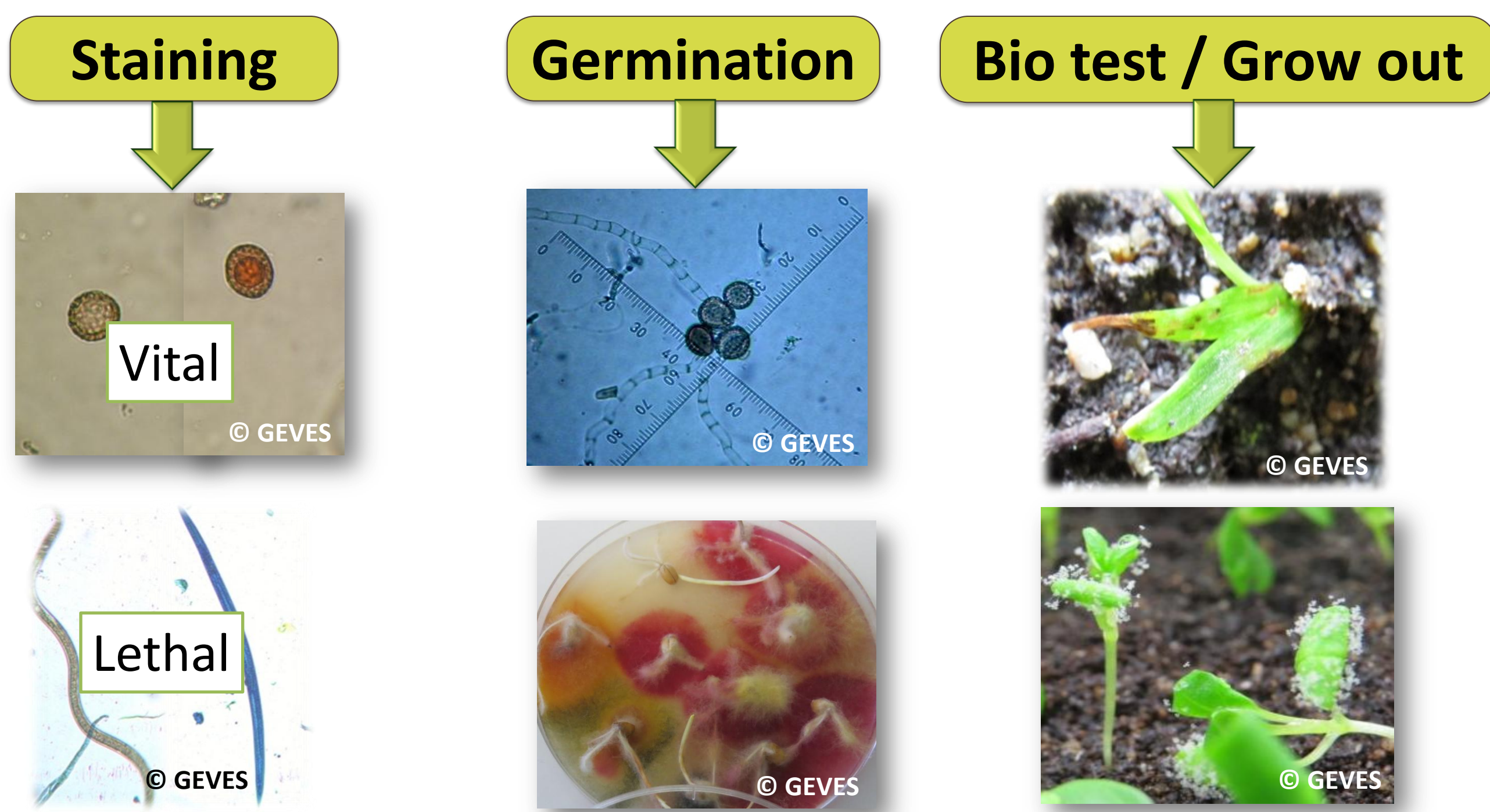
## OBJECTIVES

In order to judge the efficiency of the alternative seed treatment methods, it is necessary:

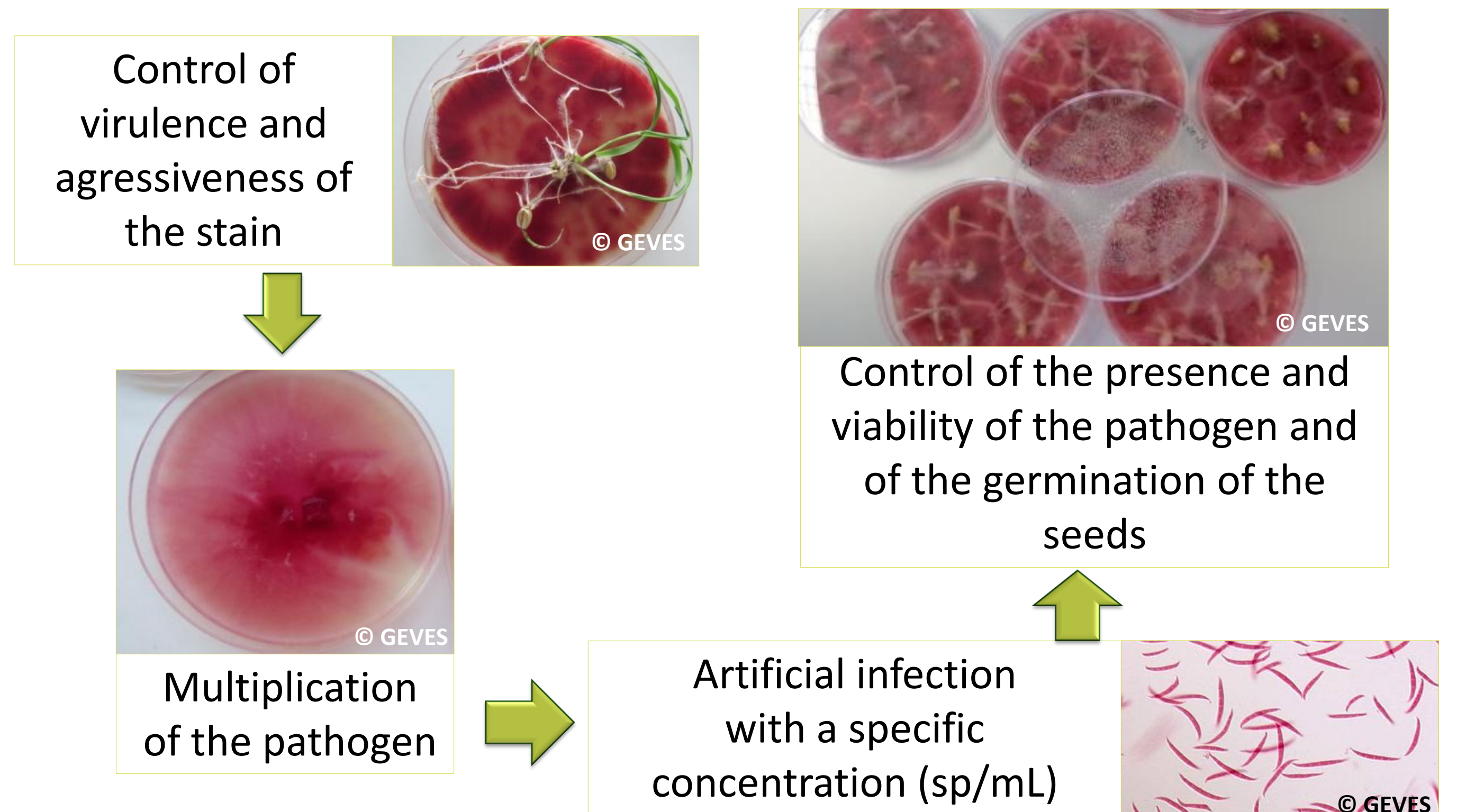
- To evaluate viability, virulence and aggressiveness of pathogens
- To carry out a pathosystem by grow out, promoting the transmission to the pathogen from seed to plant
- To know the damage threshold responsible of the first symptoms appearance

## TO CARRY OUT A PATHOSYSTEM TO EVALUATE THE EFFICIENCY OF ALTERNATIVE TREATMENT METHODS

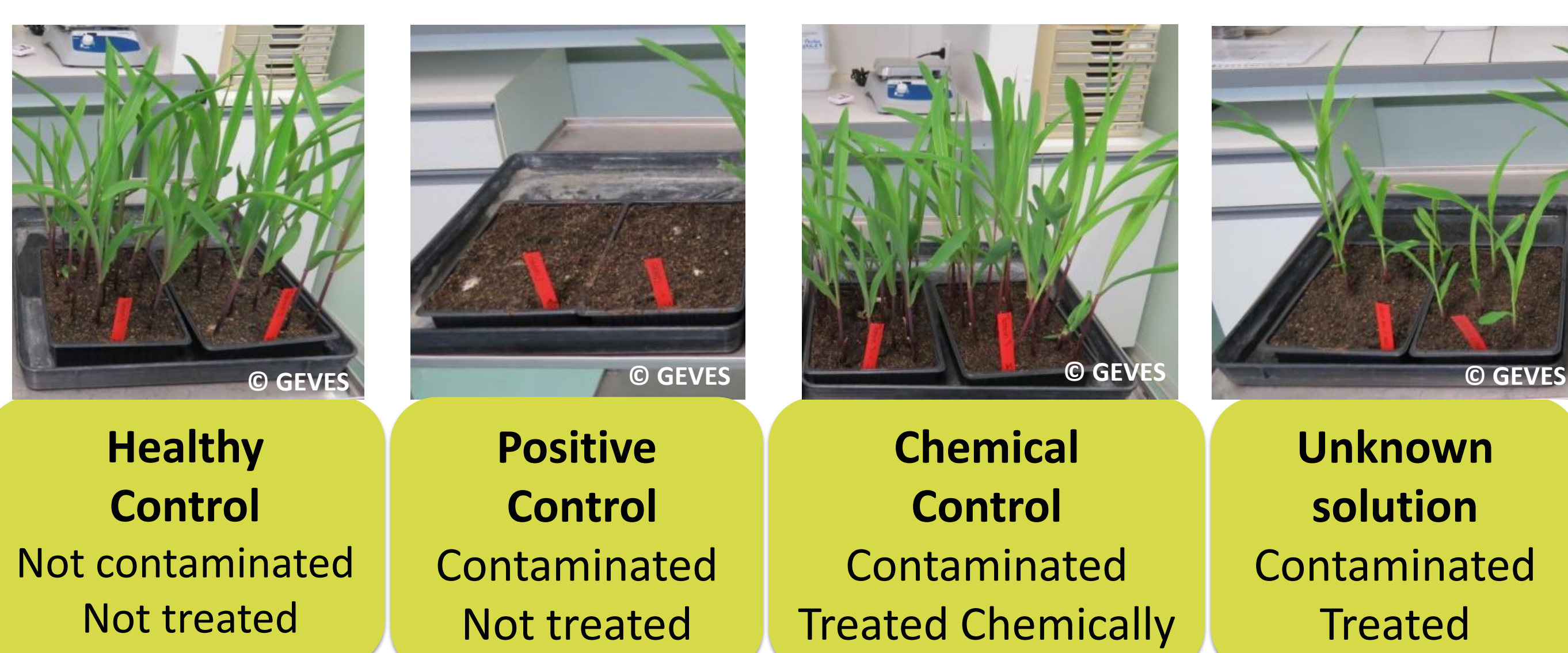
### Measurement of viability ①



### Production of inoculum ②

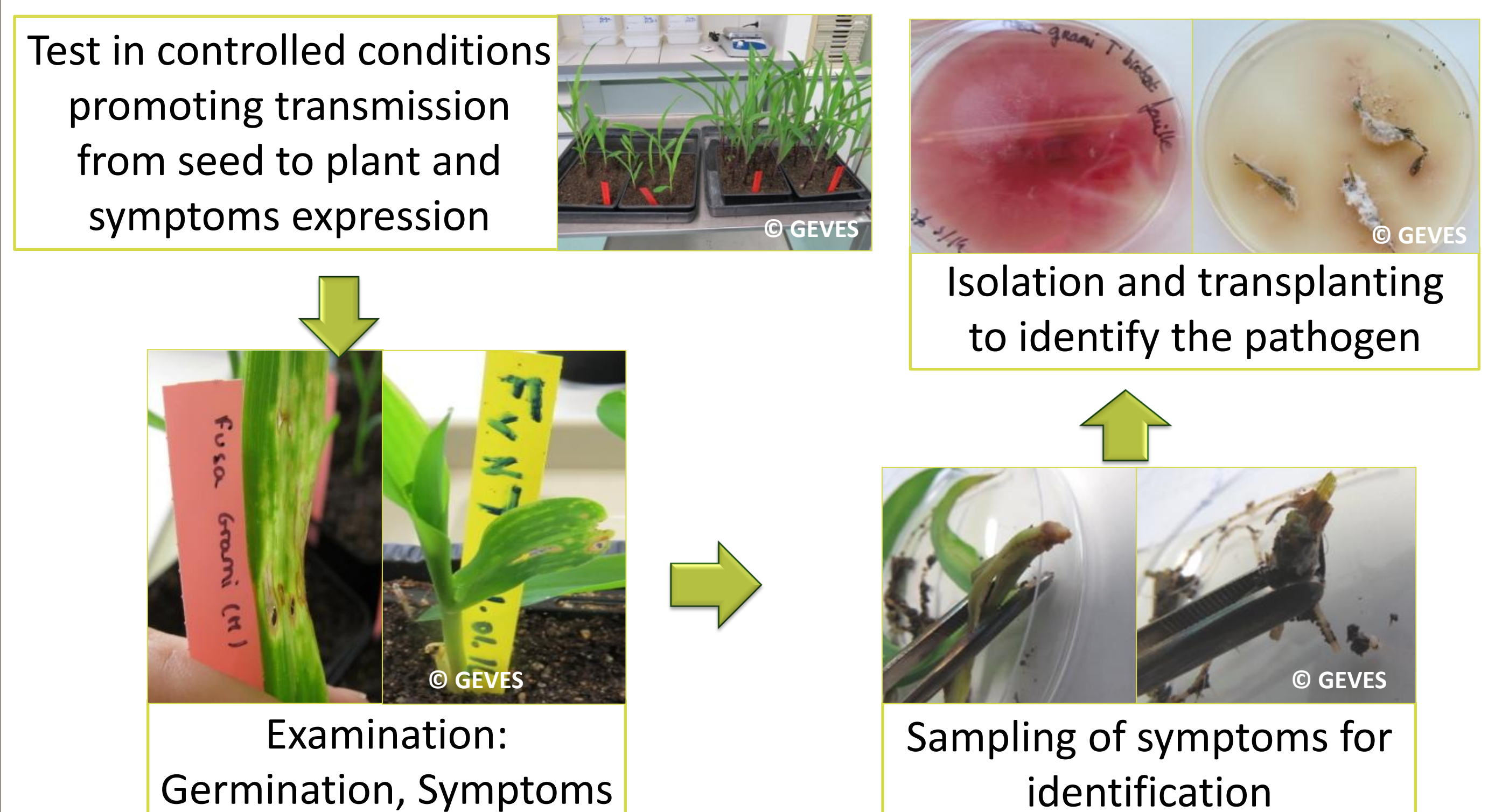


### Experimental design ③



Comparison between a reference chemical treatment, an alternative solution of treatment, a positive and a healthy control.

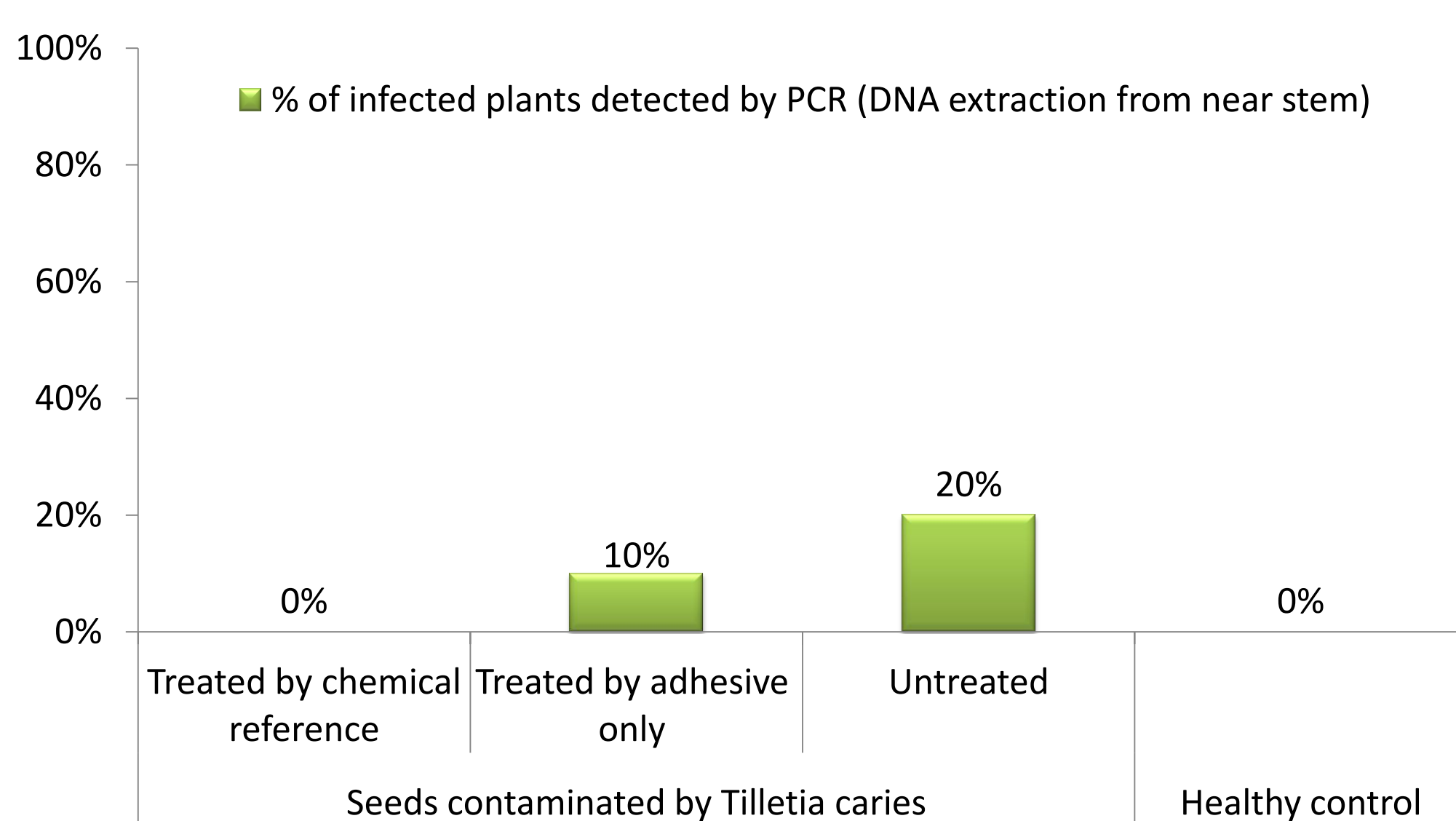
### Transmission from seed to plant ④



## TWO EXAMPLE OF PATHOSYSTEMS

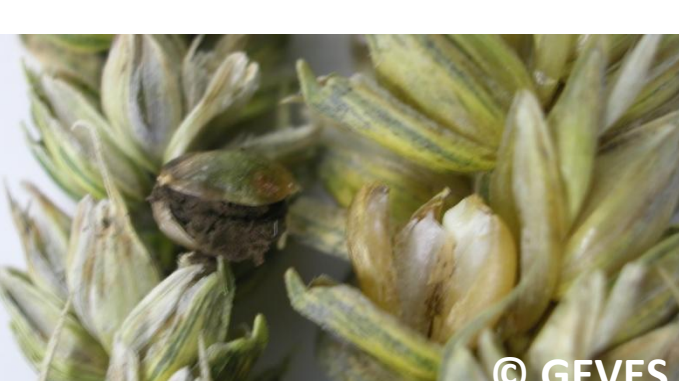
### Tilletia caries/ Wheat ①

Capacity of transmission of viable spores of common bunt from seed to plant, on treated and untreated seeds



Positive plantlet detected by PCR for the untreated and adhesive condition

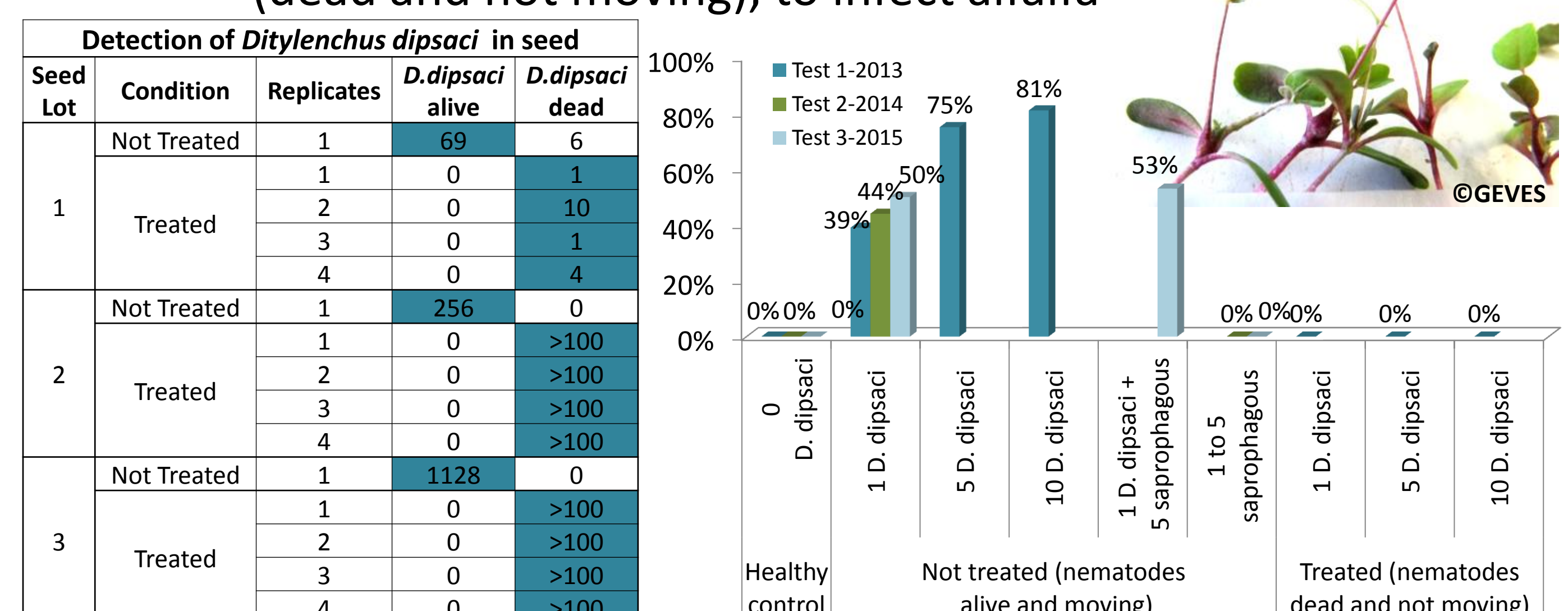
No positive plantlet detected by PCR for the chemical treated condition



Transmission from seed to plant by grow out and early detection by PCR

### Ditylenchus dipsaci/ Alfalfa ②

Capacity of nematodes, not treated (alive and moving) and treated (dead and not moving), to infect alfalfa



No *Ditylenchus dipsaci* alive detected in treated conditions → Efficiency of the treatment

*D. dipsaci* treated (not moving) and saprophagous → No swollen stem = dead nematodes  
*D. dipsaci* not treated (moving) → Swollen stem

Viability and transmission of nematodes to plant by Bio-tests

## CONCLUSION Pathosystems available to evaluate the efficiency of alternatives treatment methods