



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Federal Department of Economic Affairs,
Education and Research EAER

Agroscope

Field testing of fire blight control strategies in Switzerland

Perrine Gravalon

3rd International Symposium on Fire Blight, Dresden-Pillnitz,
September 6-9, 2022

www.agroscope.ch | good food, healthy environment



Content

- Context
- Trial protocol
- Results, quick overview
 - Efficiency of approved products
 - Variety influence
 - Potential product combinations
- Prospects





Project HERAKLES Plus 2015-2024

Resilient cider fruit production system for the future - thanks to robust varieties and sustainable disease and pest control measures



Fireblight



Marssonina



Codling moth



Cultivation & processing

Knowledge transfer

Project partner:

CAVO-Foundation, IP-SUISSE, SOV,
Fondation sur la Croix, cantons AG, FR, LU, SG, TG, ZH

Project execution:

Agroscope Wädenswil
Extension fruit growing



Fire blight in Switzerland

- Since 2020: no longer a quarantine organism
 - No obligation to declare and remove infected trees
 - Special rules for protected areas (e.g. nurseries)
- Approved products:

Product	Active ingredient	Active ingredient content (%)	Concentration (%)	Comments
LMA	potassium aluminium sulphate	79.2	4	maximum 3 applications
Myco-Sin	sulphide clay + horsetail extract	65	0.5	do not mix with copper registered against scab, powdery mildew and storage diseases
Blossom Protect	<i>Aureobasidium pullulans</i>	5.10 ¹⁰ Spores/g	0.09	registered against storage diseases
Bion	Acibenzolar-C-méthyl	50	0.00125 (before and after blossom) 0.0025 (during blossom)	
Vacciplant	Laminarine	35	0.047 (or 0.075)	registered against scab, powdery mildew and storage diseases



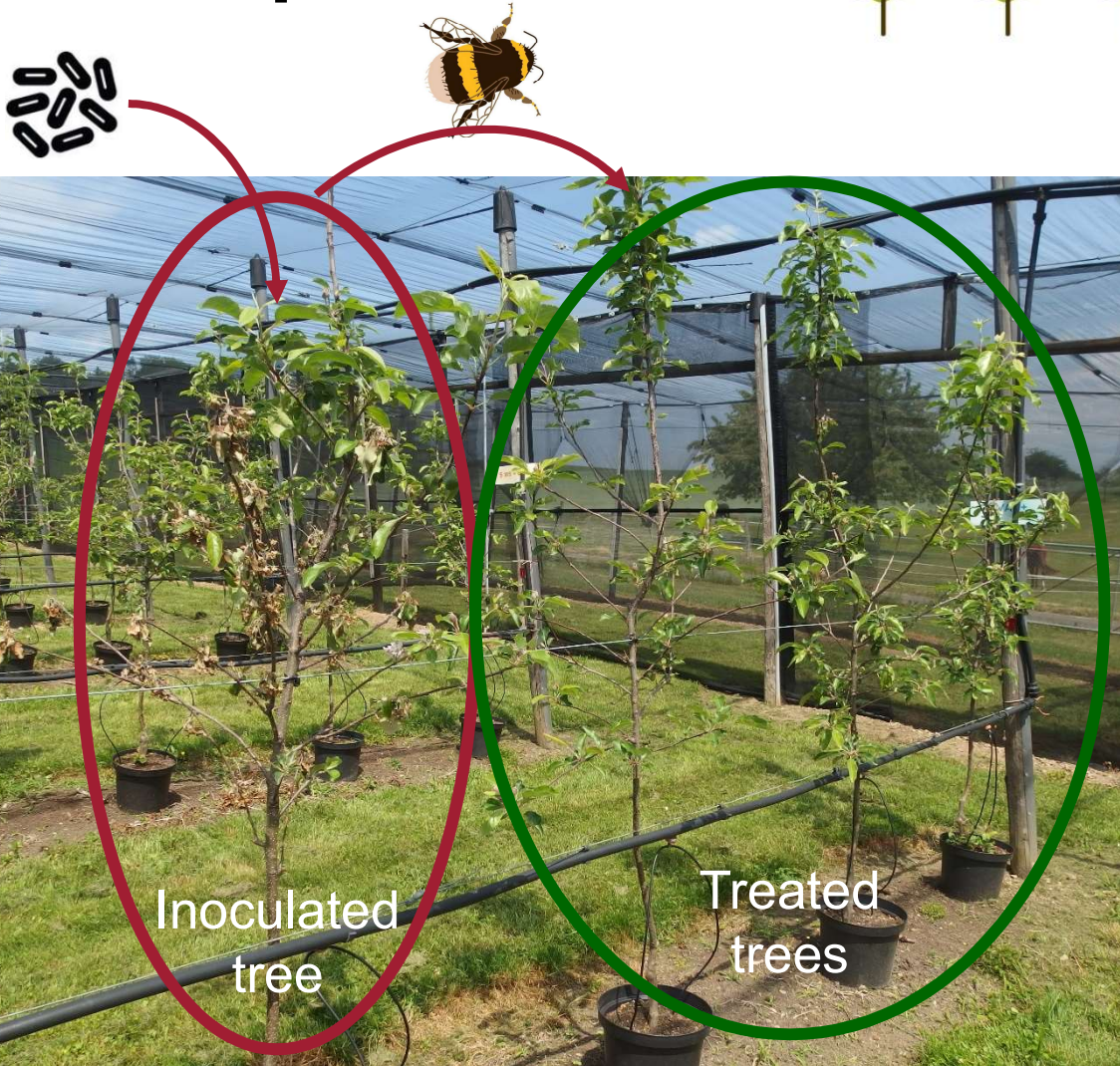
Fire blight special essay field



- Testing **varietal resistance** and **efficacy of phytosanitary products and strategies**:
 - artificial inoculation
 - plot completely enclosed with anti-insect netting
 - biosecurity measures
 - trees in pots, incinerated after trial



Trial protocol

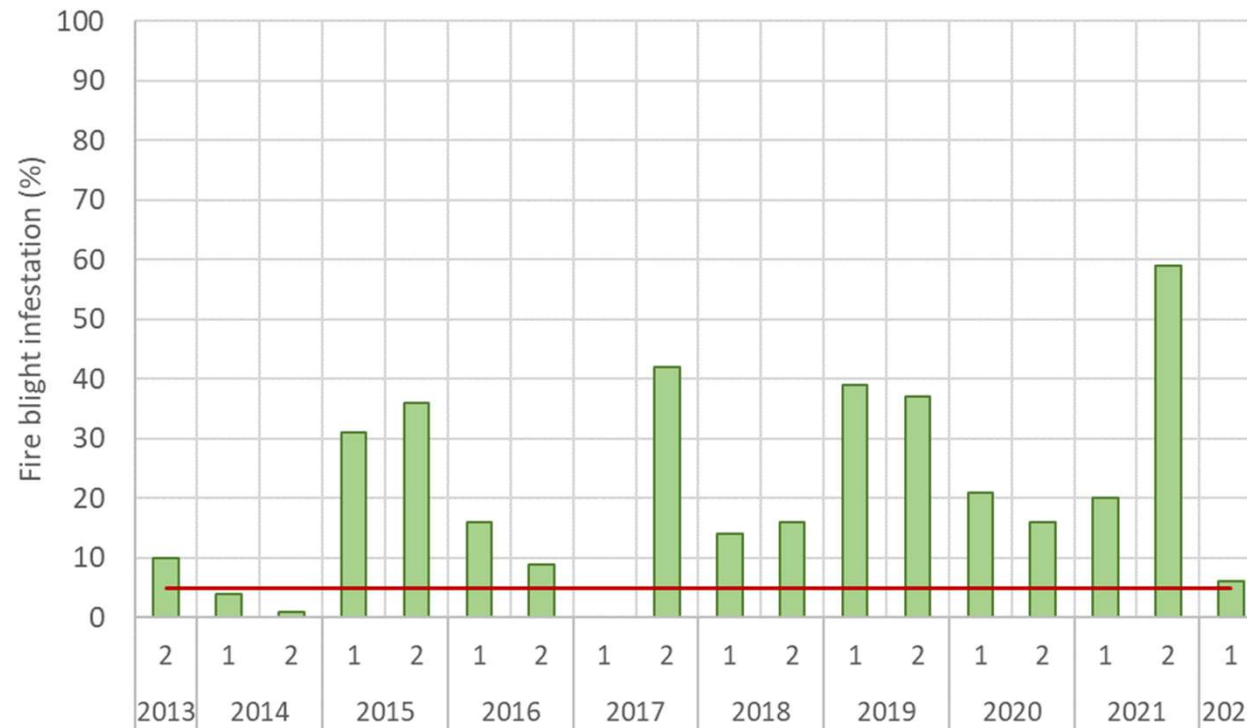


- 3 year old **Gala Galaxy** M9T337 in pots
- 6 trees per repetition, 6 repetitions per strategy
- **Untreated** trees
- **Inoculation** of middle trees during blossom (normally once)
- Dispersal of bacteria by **bumblebees**



Inoculation success over the years

Fire blight infestation over the years after inoculation



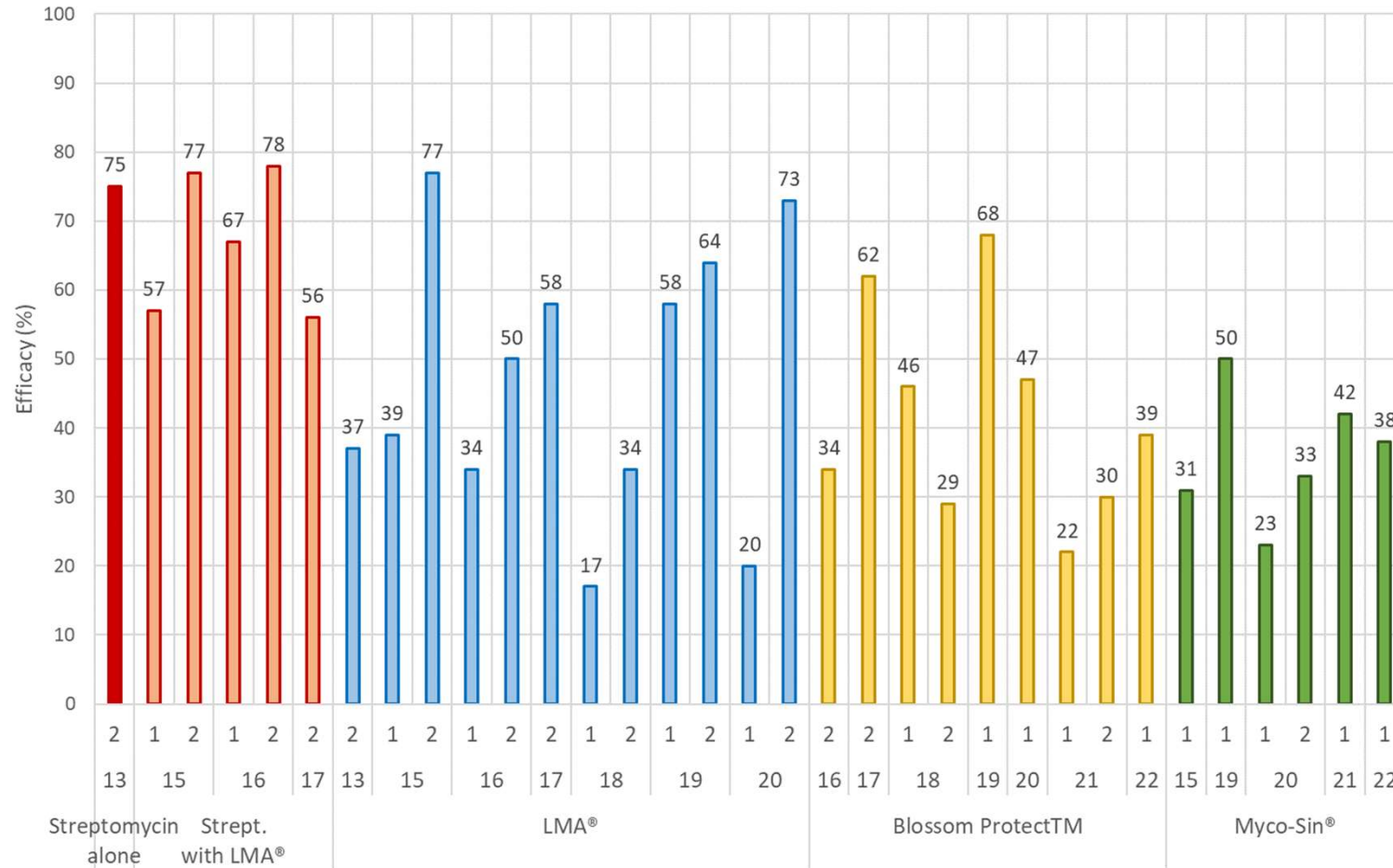
1. Regular blossom (April/May)
2. Staggered blossom (June/July)

$$Infestation = \frac{infested\ flower\ cluster \times 100}{tot.\ flower\ cluster\ for\ inoculation}$$



Efficacy of approved products over time

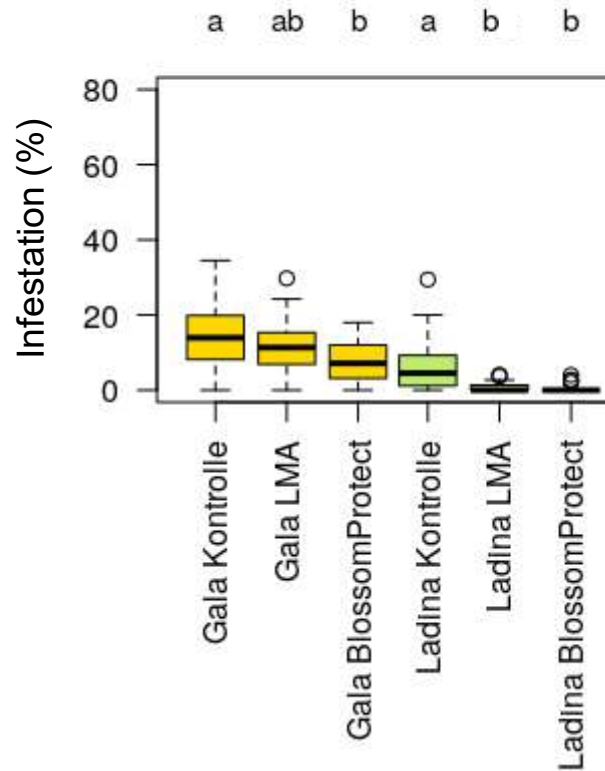
Products efficacy against fire blight in Breitenhof (CH)



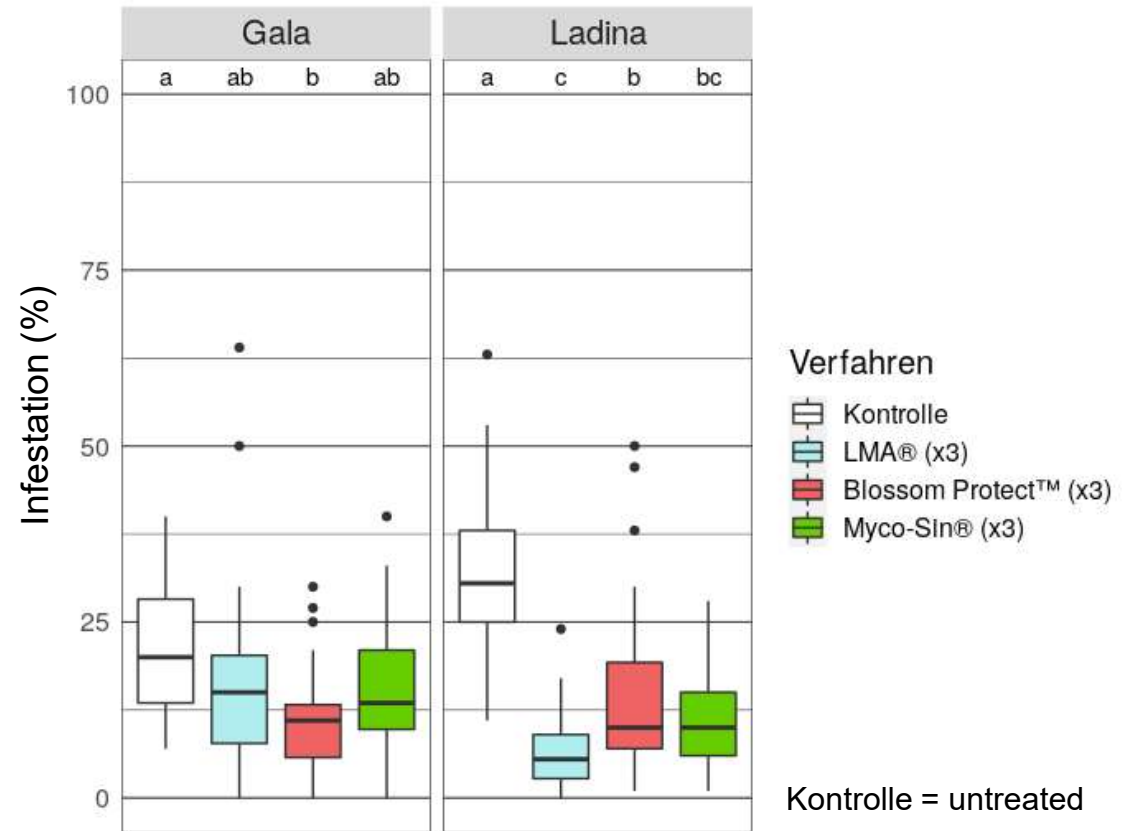


Variety influence

Fire blight trial 2018-1



Fire blight trial 2020-1

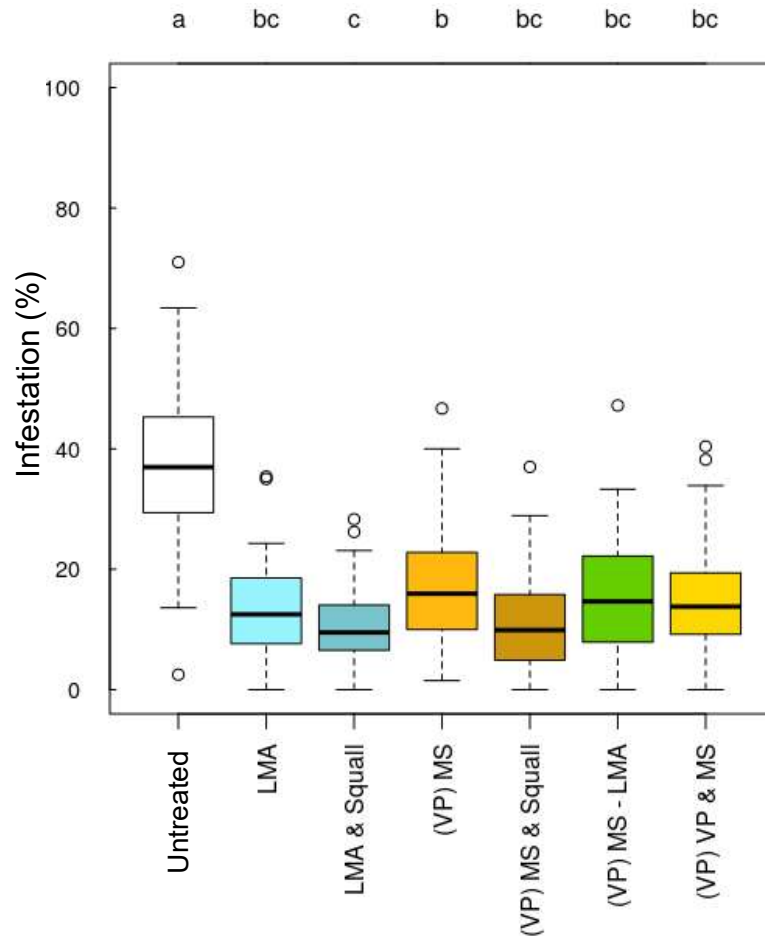


→ better efficiency of strategies on robust varieties

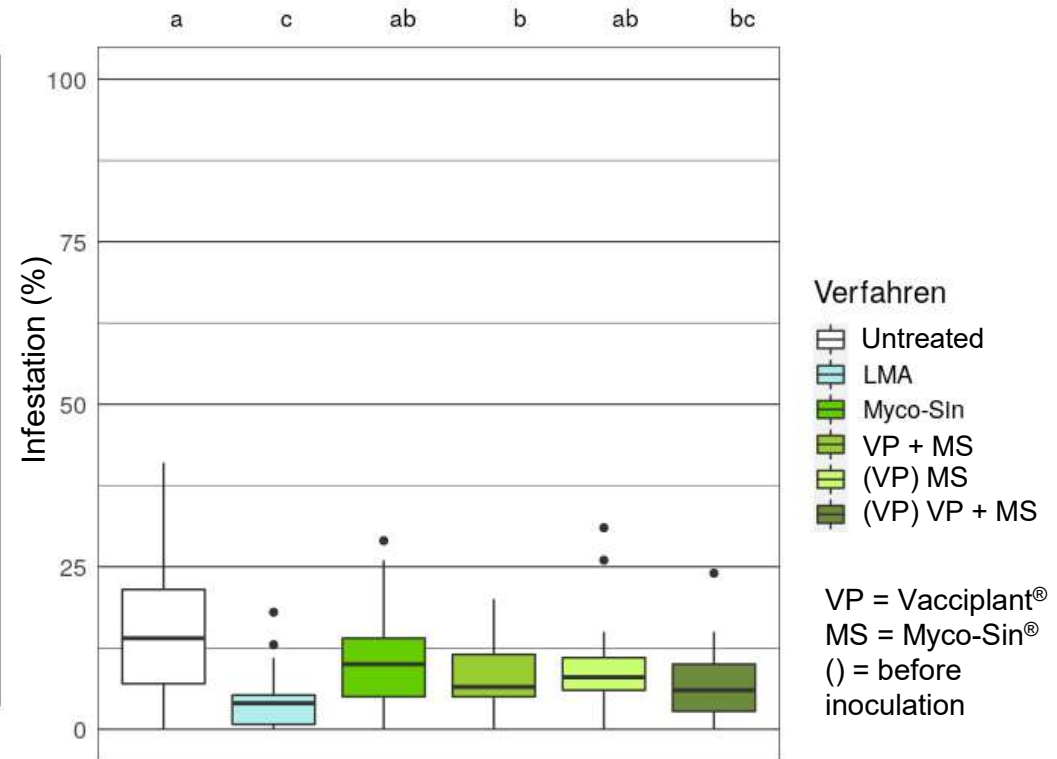


Potential products combination?

Fire blight trial 2019-2



Fire blight trial 2020-2



Verfahren

- Untreated
- LMA
- Myco-Sin
- VP + MS
- (VP) MS
- (VP) VP + MS

VP = Vacciplant®
MS = Myco-Sin®
() = before inoculation

→ the use of adjuvants or stimulators of natural defenses show a **slight improvement** of the effectiveness, but is **not significant**



Prospects

- **Every year is different** and cannot be compared with others
 - The **weather conditions** and **phenological stages** are decisive factors
 - Continue to **gather experience** to support production
 - Look for **new products/formulations** and acquire expertise
 - Antagonists (Bacteriophages, Yeast, ...)
 - New molecules
 - ...
- Find **alternatives!**

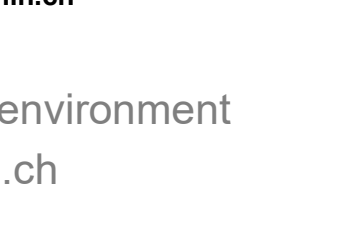
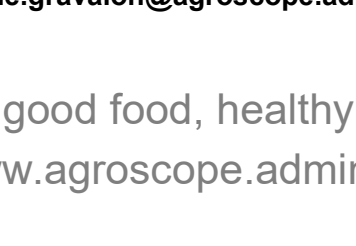
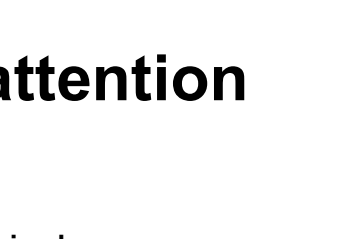
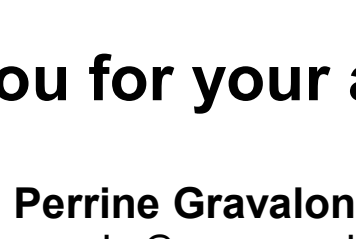
- Interest in potential of **resistant varieties**



Thanks

- Sarah Perren
- Anita Schöneberg
- Eduard Holliger
- Vanessa Reiniger
- Sandrine Kammerecker
- Thomas Schwizer and his team
- All trainees and other Agroscope colleagues who participated
- HERAKLES Partner





Thank you for your attention

Perrine Gravalon
perrine.gravalon@agroscope.admin.ch

Agroscope good food, healthy environment
www.agroscope.admin.ch