



**Cultivating Bioalliances**





# BUGLINE & GEMINI DUO SPRAYVENT

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Bioline Agrosciences Ltd  
Throws Farm, 6th May 2025





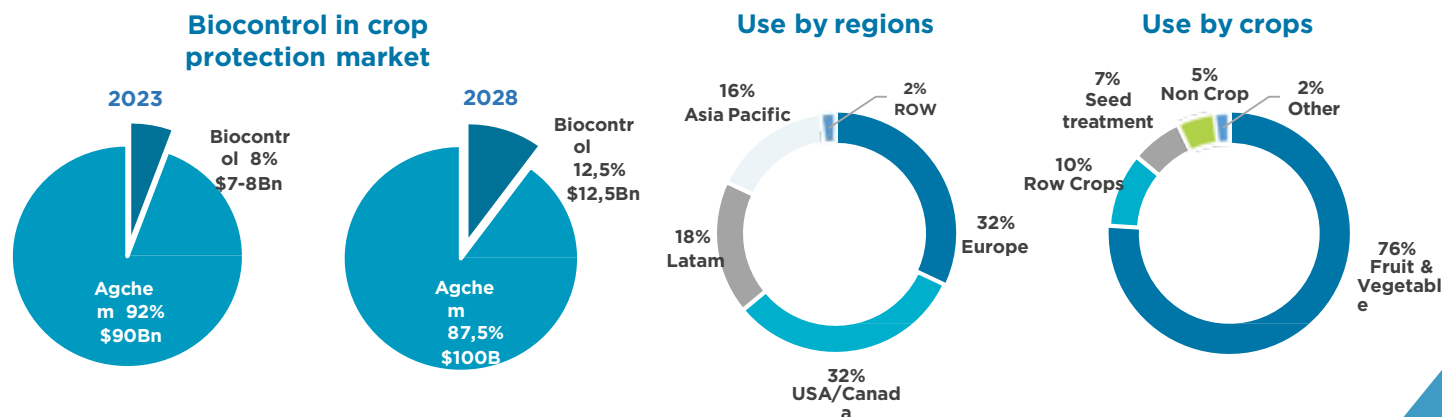
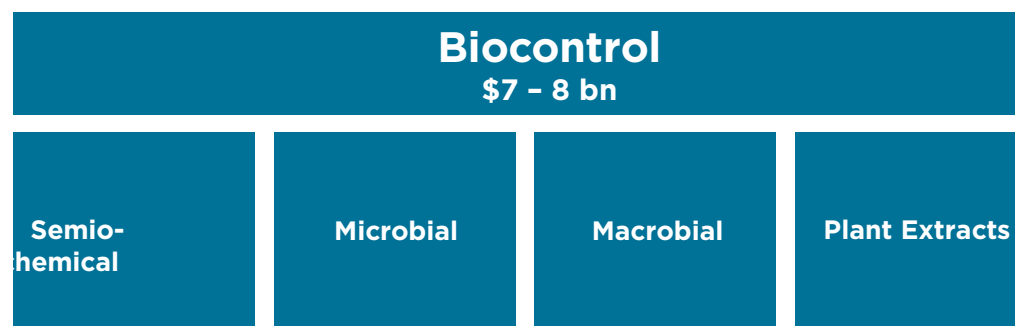
# Biological Control, the Future of Agriculture

## Cropping systems are evolving

- Increasing chemical pesticide resistance
- Reduction in approved chemical pesticides and increase in off-patent products
- Consumer demand for residue-free food and traceability
- Protecting biodiversity, soil, water, and climate
- Productive and sustainable agriculture
- Proven efficiency of biological products

## BIOLOGICAL CONTROL

\$7~8bn - Annual Growth: 10-12%



(Source: IHS Markit®, Dunham Trimmer, McKinsey, Bioline intelligence)





# Complete Biological Portfolio and Services



## Innovative Release Systems

- Proven efficacy
- Easy & safe to use
- Flexible & adaptable
- Wide range of crops



## Sustainable Technology

- Adaptable to climate changes
- Release technologies adapted to crops and pest/diseases needs

## Macrobials

Predatory mites  
Parasitoids  
Predatory insects  
Nematodes  
Insect food

## Microbials

Biofungicide  
Bionematicide  
Bioinsecticide

## Pollinators

Bumble bees

## Traps

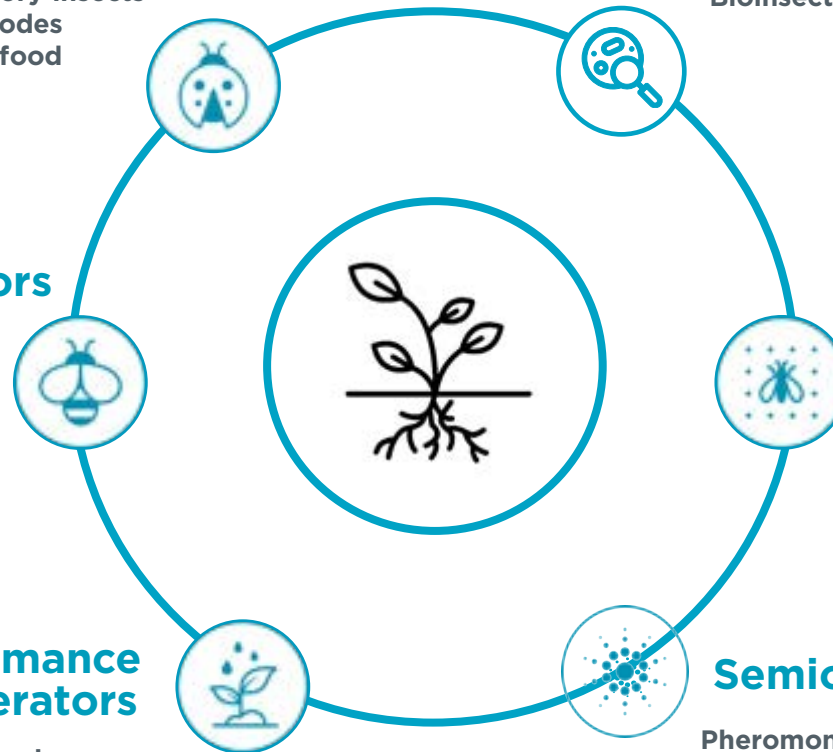
Roller traps  
Sticky traps  
Funnel traps

## Performance Accelerators

Biostimulant  
Bionutrition

## Semiochemicals

Pheromone



## Sharing Knowledge



- Helping growers and technicians become skilled in the applied biological technologies
- Biocontrol industry professionalization

## Technical Support



- Biological crop strategies
- Cost adjustment
- Product forecasting





# Our Flagship Products



Patented



Trade Secret



















Climate Adapted  
Release Technology



IBMA Bernard Blum  
Award



SIVAL Award

Product Group	Product Brand	Formulation	Release System	Sustainable Technology
Predatory Mites	Phytoline	+ 50 formulations 	Control Release 	Starskii 
	Californiline		Gemini 	
	Anderline		Duo 	
	Starskii		Sachet/stick 	
	Amblyline		Fast Release 	
			Blister 	
Parasitoid Insect	Tricholine	+ 8 formulations 	Openfield Release 	 
		T-Vitis 	T-protect / T-booster 	
			Capsule 	
			Dispenser 	
Insect Food	PREDAFIX +			



# BUGLINE & GEMINI DUO

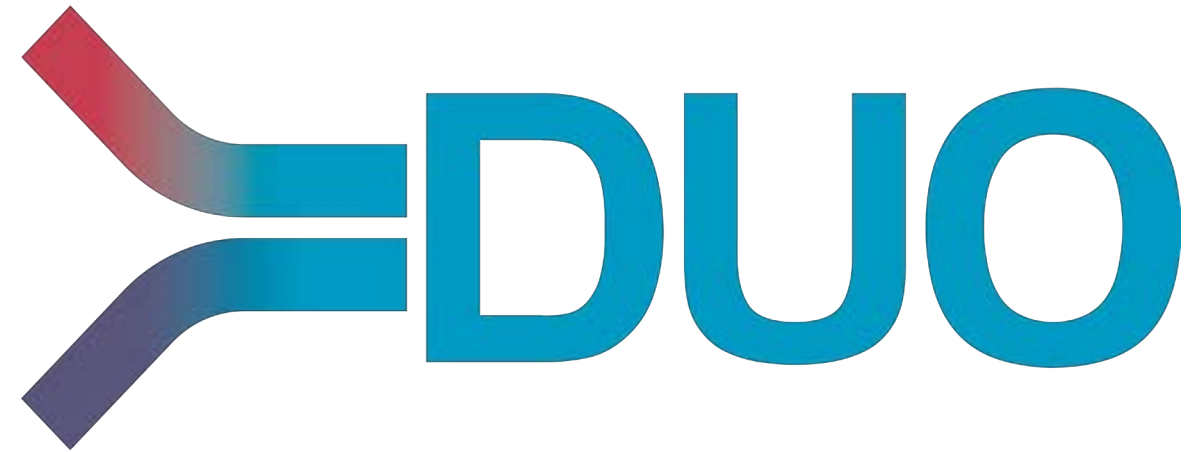
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One application, twice  
the protection



# BUGLINE & GEMINI DUO

Bugline Duo is the first release system on the market to release two species of predatory mites in a single application.





# **DISCOVERING**

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# **BUGLINE & GEMINI DUO**

# 01



✓ **BUGLINE & GEMINI DUO: the exclusive combination of two predatory mites in the same product**

- The innovative BUGLINE & GEMINI DUO contains two different species of predatory mites with complementary actions. This exclusive combination in the same release system is designed to protect crops from several pests with a single application..



## **BUGLINE & GEMINI DUO at a glance**

One application, twice the protection



## ✓CRS sachets: long-lasting effectiveness

- The sachets that make up BUGLINE & GEMINI DUO feature the CRS technology. Thanks to this technology, each sachet constitutes a mini-breeding system of predatory mites. They gradually emerge from the sachet over a period of several weeks, ensuring continuous crop protection.



# BUGLINE & GEMINI DUO at a glance

One application, twice the protection



✓ **BUGLINE DUO: a self-dosing strip for easy application**

- The Bugline system consists of sachets attached to each other to form a strip. The predatory mites species are distributed in the sachets at a constant dose and in totally regular spacing assuring a uniform dose without having to worry about the distribution of the products.
- The paper used to make Bugline Duo is waterproof, and the exit holes for predatory mites are on the underside, Bugline Duo can withstand standard overhead spraying situations.



## **BUGLINE DUO at a glance**

One application, twice the protection



✓ **GEMINI DUO: an easy-to-install protective system**

- The Gemini system consists of two sachets attached to each other to form a tent. With a single species in each side
- This ensures a regular ratio between the two species when the Gemini Duo sachet is applied. Thanks to the tent shape of the Gemini Duo delivery system, the water resistance of the paper and the exit holes for the predatory mites being on the underside, Gemini Duo withstands standard overhead watering situations.



# GEMINI DUO at a glance

## One application, twice the protection



# Why choose BUGLINE & GEMINI DUO?

## ✓ Better pest control

- Effective against several pests in a single application thanks to the exclusive combination of different predatory mite species
- Perfect application spacing: the application ratio of the two species is guaranteed because the sachets containing each of the species are attached to each other





# Why choose BUGLINE & GEMINI DUO?

## ✓ Easier and faster application

- BUGLINE DUO:
  - Simply unroll the strip in the crop for upto 50% reduction in application time
  - Automatable system: the strip can be attached to the boom of a spraying system integrated into the greenhouse to mechanise unrolling and save even more time during application
- GEMINI DUO: simply attach the Gemini Duo delivery system to the crop to reduce application time





# Why choose BUGLINE & GEMINI DUO?

## ✓ Safer product

- No dosage errors: the BUGLINE DUO strip ensures uniform distribution, even without expert application of beneficials
- Perfect uniformity of application: the spaces between the sachets are identical
- No residues on the crop
- No loss of product through sliding between the leaves
- Quick and easy removal of the strip at the end of the efficacy period







## BUGLINE & GEMINI DUO: Target crops and uses

**BUGLINE & GEMINI DUO**  
can be used on **multiple**  
crops such as:

- ✓ Cucumbers
- ✓ Strawberries
- ✓ Ornamentals
- ✓ Aubergines
- ✓ Melon Watermelon
- ✓ Courgettes
- ✓ Herbs
- ✓ Cannabis
- ✓ And others...



# BUGLINE & GEMINI DUO

## Packaging available

BUGLINE AND GEMINI DUO are available as different combinations of mites.

As your distributor for information on available products



## BUGLINE DUO

### SWICAL

- Swirskii 250 mites per sachet (1 sachet per meter / 250 mites per meter)
- Californicus 125 mites per sachet (1 sachet per meter / 125 mites per meter)
- Sachet alternance: A/O/O/O/O/B/O/C/O/O

### CUCAND

- Cucumeris 500 mites per sachet (1 sachet per meter / 500 mites per meter)
- Andersoni 125 mites per sachet (1 sachet per meter / 125 mites per meter)
- Sachet alternance: A/O/O/O/O/B/O/O/O/O

## GEMINI DUO

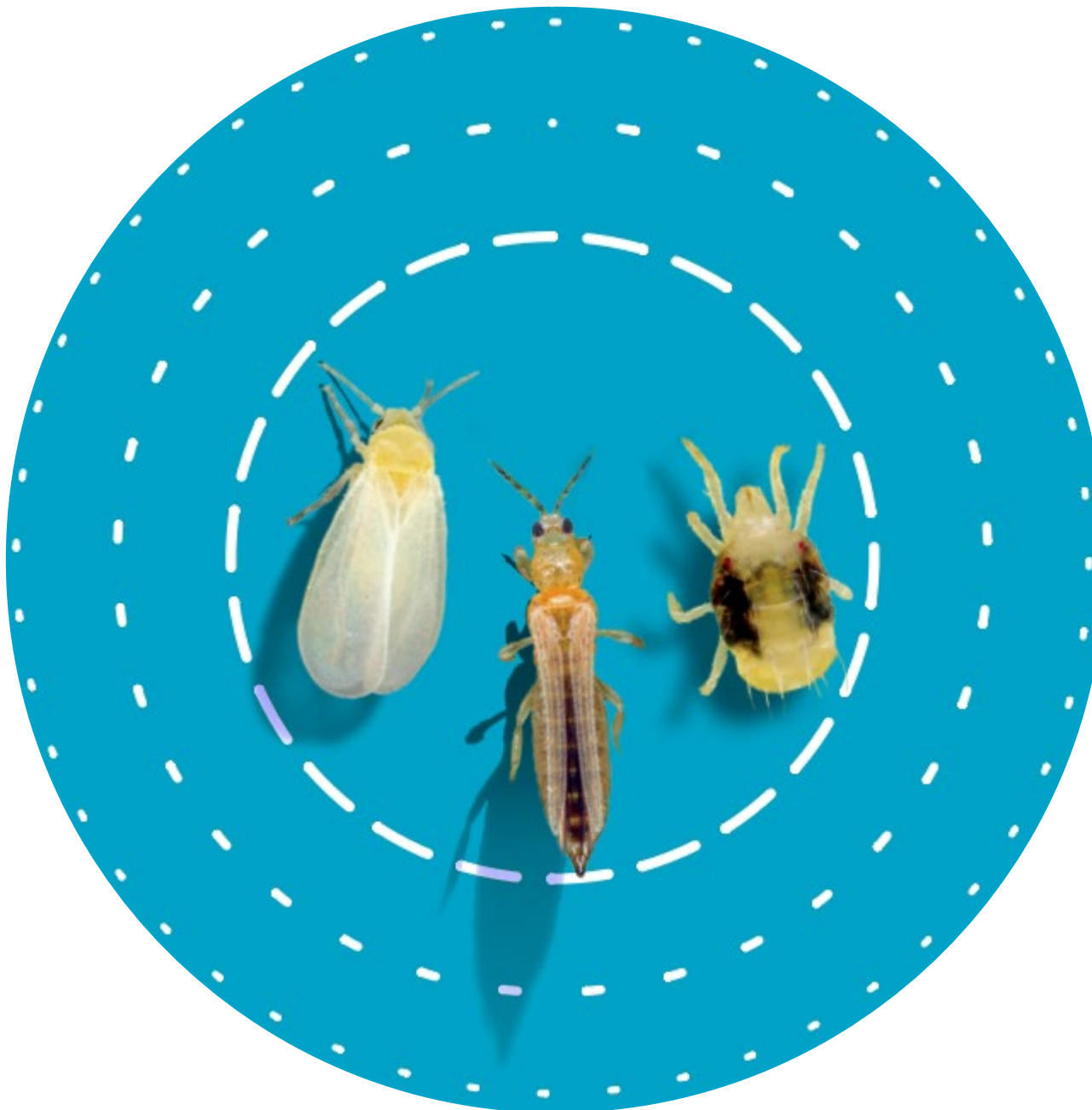
### SWICAL

- Swirskii 125 mites per sachet
- Californicus 125 mites per sachet

### CUCAND

- Cucumeris 500 mites per sachet
- Andersoni 125 mites per sachet





## BUGLINE & GEMINI DUO: Target pests

### BUGLINE & GEMINI DUO

will have a strong performance against the following pests, depending on the combination:

- ✓ Thrips
- ✓ Tarsonemid mite
- ✓ Red spider mite (TSSM)
- ✓ Russet mite
- ✓ Whitefly





### BUGLINE DUO

- The product is ready to use
- Unroll the strips on the crop according to your adviser's recommendations
- The strips can be attached to a spray boom to automate unrolling.- Leave in place for at least 6 weeks



### BUGLINE AND GEMINI DUO

The power of two predatory mites combined in a single product



### GEMINI DUO

- The product is ready to use
- Hang the Gemini Duo sachets on the crop according to your adviser's recommendations
- Leave in place for at least 6 weeks

## How to use BUGLINE & GEMINI DUO?

### HANDLING AND STORAGE

- ✓ Transport and store at 10-15°C and > 65% humidity
- ✓ Avoid exposure to direct sunlight
- ✓ Use within 18 hours of receipt





# Sprayvent

*High precision mite sprayer*



# SPRAYVENT

A patented sprayer for the application of *Phytoseiulus* in liquid form.

Ensures uniform distribution, reduces losses, and improves efficiency.

SPRAYVENT making biological pest control easier, faster, and more effective.





# SPRAYVENT

SPRAYVENT: the first liquid-phase *Phytoseiulus* spraying system on the market

SPRAYVENT combines:

A unique formulation  
ensuring the survival  
of *Phytoseiulus* in  
solution



A patented device  
combining a special  
nozzle with ventilation  
to spray the solution  
onto the crop

For a uniform, targeted and harmless  
application of *Phytoseiulus*







**Fast and  
easy  
application**



**Precise  
targetting**



**Homogeneous  
distribution**



**High  
autonomy**



**No  
losses**



**No visible  
substrate**







How it works





15-litre tank  
covering up to 2  
hours / approx.  
10 linear km per  
fill

Protective cover  
for battery and  
motor

Flexible tube  
bringing air from  
fan



Comfortable  
backpack

Spray gun-  
nozzle for a  
gentle spray  
causing no  
damage to the  
mites

Pipe with flow  
rate control  
feeds  
*Phytoseiulus*  
into the  
ventilated air  
stream

# SPRAYVENT

## Machine description



# SPRAYVENT

## HOW IT WORKS

- *Phytoseiulus* pre-mixed in solution with the adjuvant, is placed in the tank
- A fan creates a power-controlled airflow, channeled into the flexible duct
- The *Phytoseiulus* solution flows under gravity through the intake pipe
- The flow of *Phytoseiulus* is regulated by a dosing valve
- The aqueous solution and the ventilated air mix in the nozzle
- The nozzle creates fine droplets of solution containing *Phytoseiulus*, which are carried by the airflow to the plants

Bioline Agrosciences HTA open day; 6th May 2025



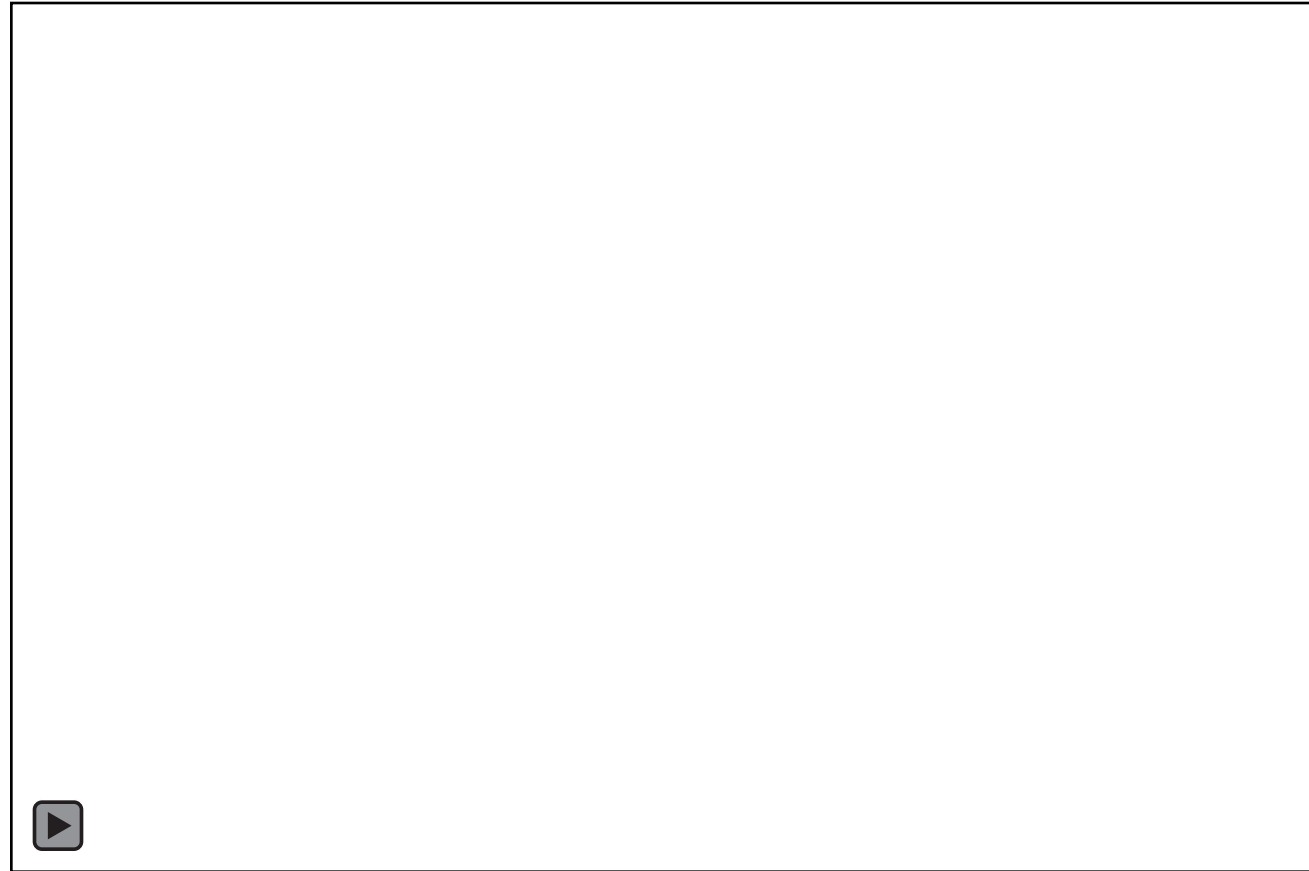




# SPRAYVENT

## LIBERATION OF PHYTOSEIULUS

- The protective bubble containing the *Phytoseiulus* sticks to the plant's leaf, preventing them from falling to the ground
- The solution dries very quickly and releases the *Phytoseiulus*
- See illustrative film opposite







**Product benefits**





✓ *The first, patented, liquid phase spraying for Phytoseiulus*

✓ *No losses: Phytoseiulus do not fall to the ground*

✓ *Homogeneous distribution of Phytoseiulus on plants improves efficiency*

✓ *Precise targeting of specific areas of the plant*

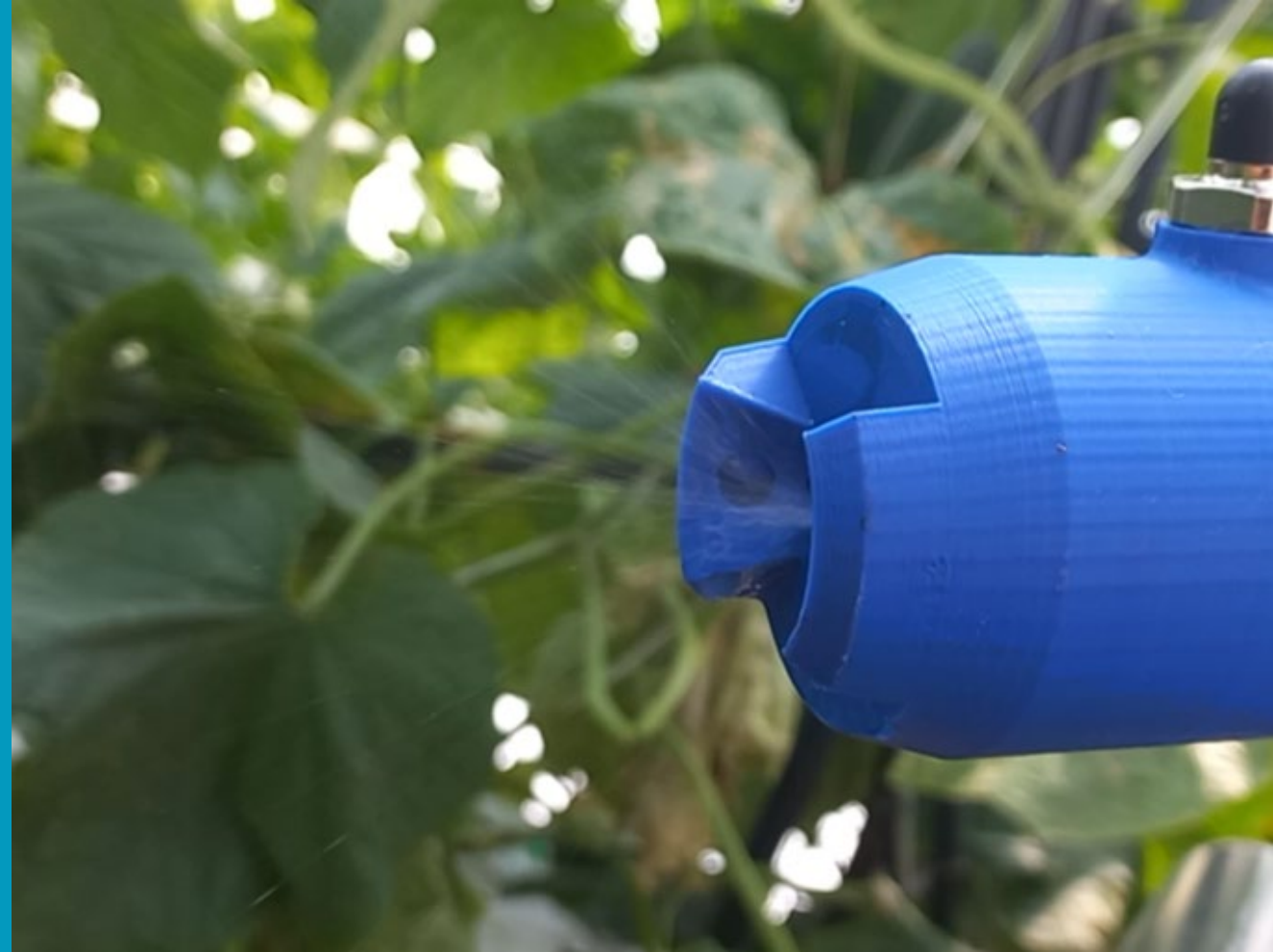
✓ *Fast application: saves time on application*

✓ *Easy application: no variability due to the operator*

✓ *No visible substrate or residue on the crop*

✓ *Very low water volume*

✓ *Reduction of packaging waste*



# SPRAYVENT

The high-precision predatory mite sprayer



# FASTER

The use of the SPRAYVENT machine reduces the average application time by 14%

## Time to apply

Machine  Sprayvent

  **46**  
seconds

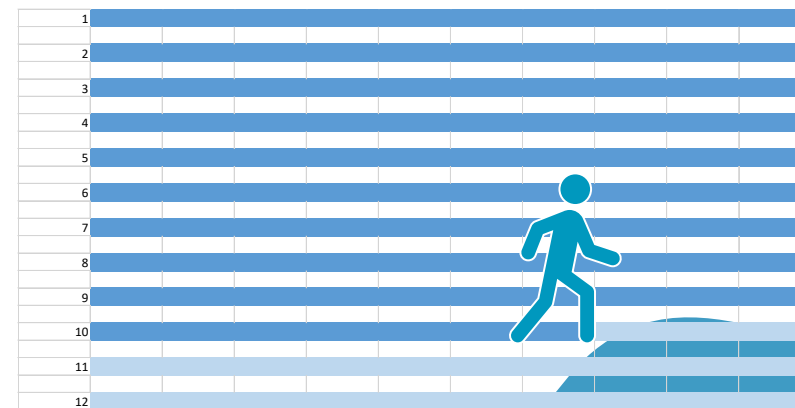
Average time to  
complete 1 row

Manual application

 **53**  
seconds

14 %  
time  
saved

Representation of the surface covered in 15 minutes by walking in rows of 100 m





# MORE EFFICIENT

Using the SPRAYVENT machine reduces losses due to falling to the ground by -76% at least



In a situation where there is 100% foliage cover, the reduction in losses due to falls to the ground increases up to -100%

## Loss of product to the ground

Machine



Sprayvent

Manual application

Proportion of  
mites falling to  
the ground

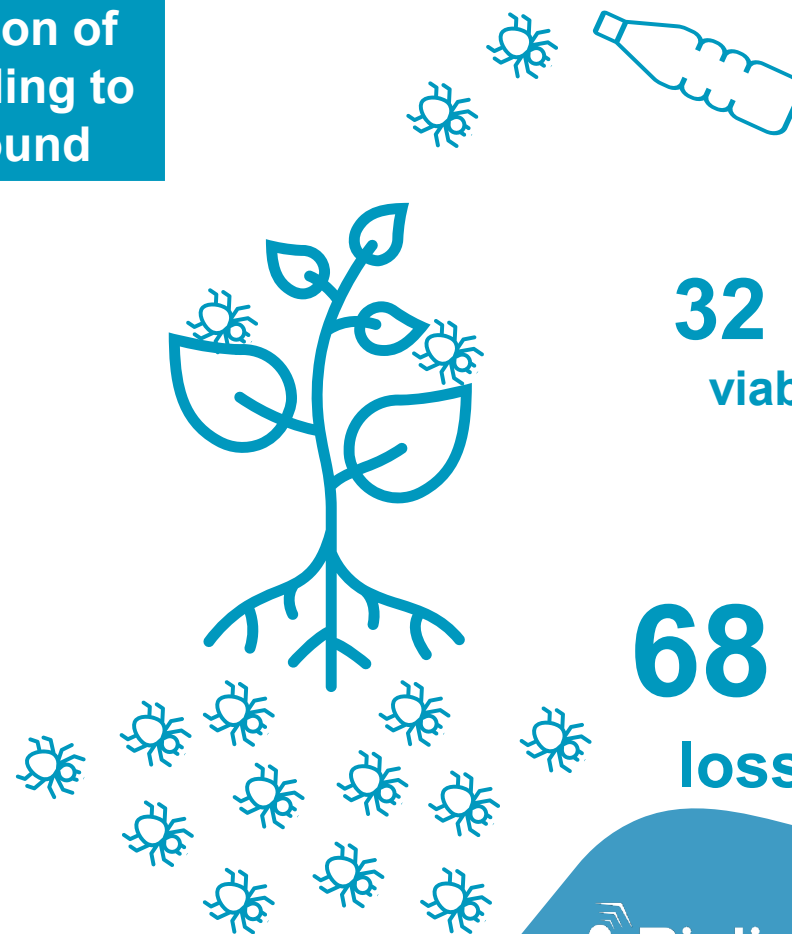
**84 %**  
viable

**16 %**  
losses



**32 %**  
viable

**68 %**  
losses





# MORE ACCURATE

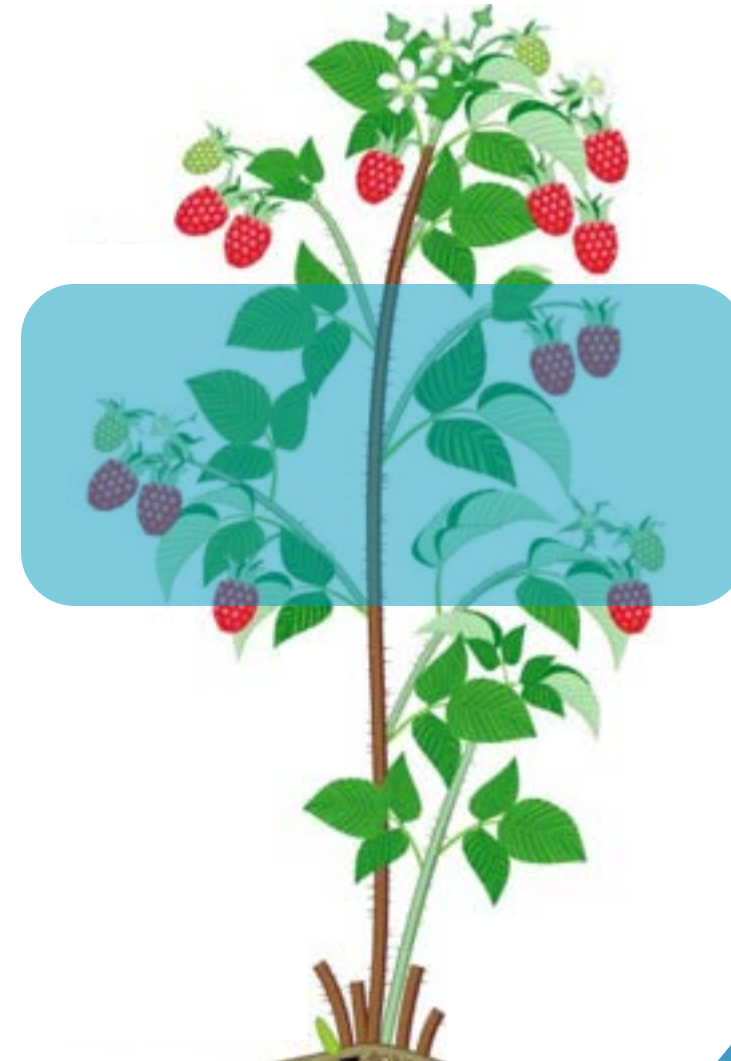
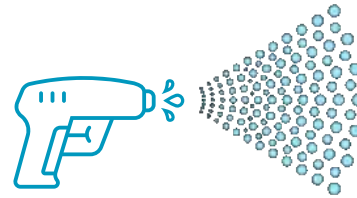
Application accuracy:

- Precise targeting of the area of the plant to be protected

Homogeneity of application:

- Homogeneous mixing = homogeneous application
  - Mites do not concentrate in certain areas as they can do in substrate
  - No blocks falls as with solid substrates

## Homogeneity and accuracy of application





# EASIER

Easy to apply: no operator variability

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Leaves no visible substrate on plants

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Very low volume of water

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Reduces the volume of packaging

## Fewer constraints



**The machine is easy to use and consistently doses predatory mites**



**Low-dose, food-grade additive, water soluble and transparent**



**10 L of water per hectare, negligible effect on disease risk**



**The absence of substrate reduces the volume of packaging by a factor of 5: less waste, reduced ecological impact linked to transport**







**Trial results**





# Trials n°1 on roses

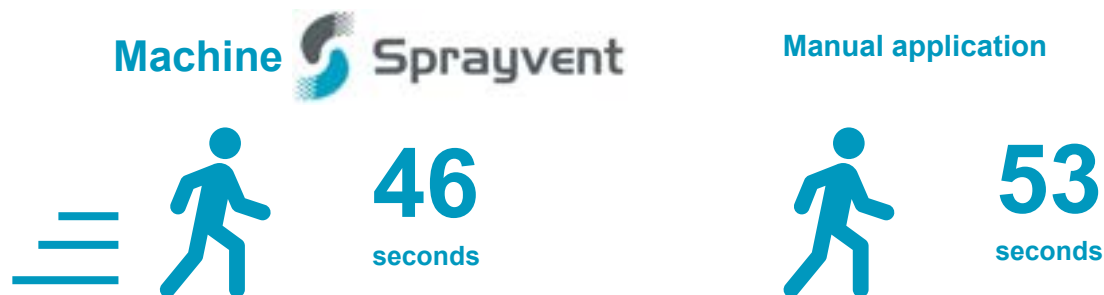
## OBJECTIVES :

- Measure application time
- Calculate losses on the ground



## Release trial results

### The use of the SPRAYVENT machine reduces the average application time by 14%



Average time to complete 1 row

14 % time saved



#### Location:

- Rose greenhouses in Kenya– Naivasha - Kingfisher farm in greenhouse 72

#### Treatments:

- M1- Manual application
- M2 -Application Sprayvent
- T -Control

#### Dose rate:

- Identical doses for M1 and M2 (50 *Phytoseiulus* per m<sup>2</sup>)
- No application in the control

#### Frequency of application:

- Weekly

#### Micro-plot size:

- 8 bays of 8 rows each
- Row length: 58 m

#### Measurements:

- Application time per row in seconds
- Uniformity of application: count the number of *Phytoseiulus* in 10 randomly selected areas
- Losses on the ground: count of *Phytoseiulus* on sticky traps placed on the ground



# Trials n°1 on roses

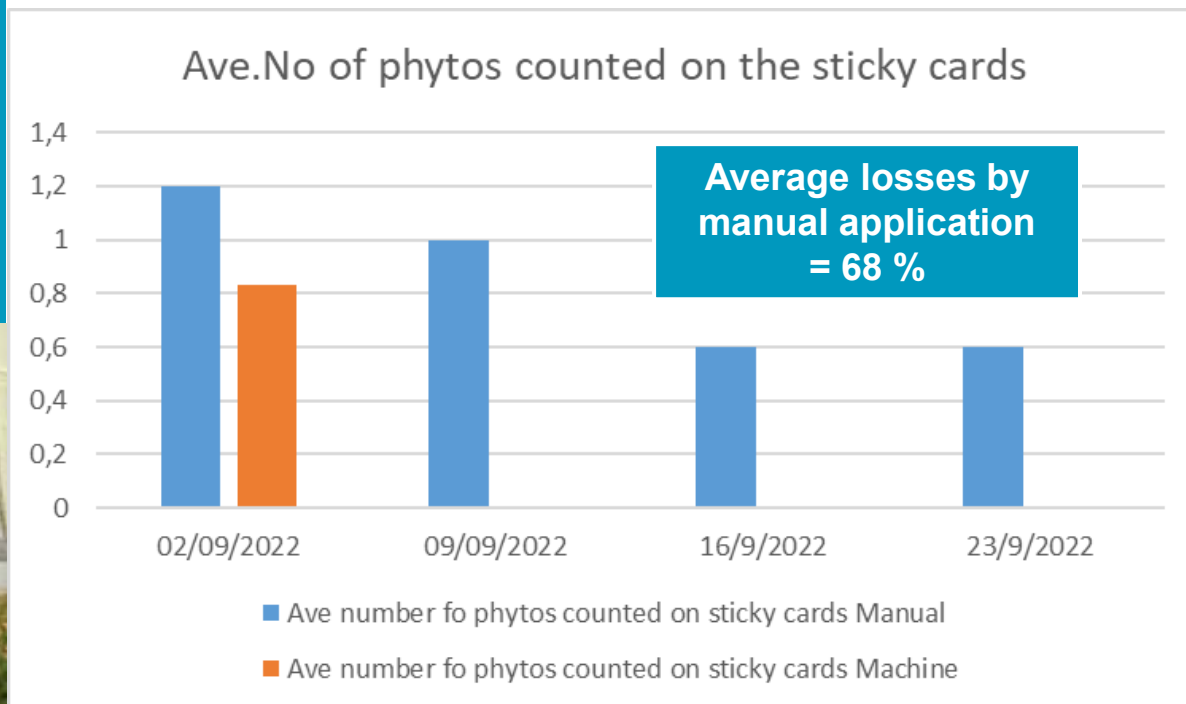
## OBJECTIVES :

- Measure application time
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## Release trial results

**The SPRAYVENT machine reduces losses which fall to the ground by -76% at least\***



\*It is assumed that the losses on the SPRAYVENT modality during the first count are related to the fact that leafcover was less than 100%



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