Biological Pest Control in Cucumbers

Strategies and Biobest products

Thrips

Frankliniella occidentalis



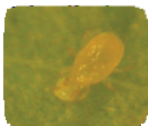
Primary product

A. swirskii

	Dose		Interval
	1st cycle	2nd/3rd cycle	
Preventive	1 SBS* sachet/ 3 plants	1 SBS*sachet/ 2-3 plants	4-6 weeks
Curative	50 ind./m² (hot spot)	50 ind./m² (hot spot)	2x 1 week

*SBS = Swirskii Breeding System

A. cucumeris



	Dose		Interval
	1st cycle	2nd/3rd cycle	
Preventive	50 ind./m² (full field)	50 ind./m² (full field)	1 week after transplanting
Curative	100 ind./m² (hot spots)	100 ind./m² (hot spots)	2x 1 week

Amblyseius system 25.000/50.000
Amblyseius system 125.000/250.000
Amblyseius system 500.000


Swirskii system 10.000/125.000
Swirskii Breeding system 100/500
Swirskii LL system 500

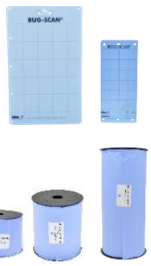
Complementary products

O. laevigatus

	Dose	Interval
Curative	10-25 ind./m² in and around hotspots and sensitive area	1x

Orius system 500
Orius system 2000

Bug-Scan blue cards & rolls



	Size	Quantity
Monitoring	25x10 cm	25-50/ha
Mass trapping	25x40 cm 25x20 cm	50-100/ha
Mass trapping (rolls)	10 cm x125 cm 15 cm x125 cm 30 cm x100 cm	Strategic place or each row

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Spider mites

Tetranychus urticae

Primary product

Phytoseiulus persimilis

	Dose	Interval
Curative	6 ind./m² (full field)	Weekly min.2 releases
	50-100/m² in hot spots	Repeat if necessary

Phytoseiulus-system 2000
Phytoseiulus-system 10.000
Phytoseiulus-system 25.000

Complementary products

Feltiella acarisuga

	Dose	Interval
Preventive	2-4 pots/ha	2 weeks
Curative	1 pot/hot spot 2-3 times	1 week

Feltiella-system 250

Amblyseius californicus/andersoni

Andersoni Breeding system 500

Californicus Breeding system 100/500

	Dose		Interval
	1st/2nd cycle	2nd/3rd cycle	
Preventive	1 An.BS* sachet/ 4-6 plants	1 CBS** sachet/4-6 plants In case of low humidity	4-6 weeks

***An.BS = Andersoni Breeding System**
****CBS = Californicus Breeding System**

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Whiteflies

Trialeurodes vaporariorum & Bemisia tabaci

Trialeurodes vaporariorum adult

Trialeurodes vaporariorum pupae

Bemisia tabaci pupae

Bemisia tabaci pupae

Primary product

A.swirskii (*T.vaporariorum & B.tabaci*)

	Dose		Interval
	1st cycle	2nd/3rd cycle	
Preventive	1 SBS*/3 plants (full field)	1 SBS*/2-3 plants (full field)	4-6 weeks
Curative	50 ind./m² (hot spot)	50 ind./m² (hot spot)	1 week

*SBS = Swirskii Breeding System

Swirskii system 10.000/125.000
Swirskii Breeding system 100/500
Swirskii LL system 500

Encarsia formosa (*Trialeurodes vaporariorum*)

	Dose	Interval
Preventive	1-2 ind./m² min. 4 introduction	1-2 weeks
Curative	3-4 ind./m² until 80% parasitism	weekly

Encarsia-system 5000/10,000

*Eretmocerus eremicus** (*T.vaporariorum & B.tabaci*)

	Dose	Interval
Preventive	2-3 ind./m² min. 4 introduction	1-2 weeks
Curative	4-6 ind./m² Until 80% parasitism	weekly

Eretmocerus-system 5000/10,000

Complimentary products

Mix *E.formosa* & *E.eremicus*

	Dose	Interval
Preventive	2-3 ind./m² min. 4 introduction	1-2 weeks
Curative	4-6 ind./m² Until 80% parasitism	weekly

Eretmix-system* 5000/10,000

*From March to September, in warmer conditions and/or mixed whitefly species

PreFeRal® WG (*T.vaporariorum & B.tabaci*)

	Dose	Interval
Detection	100g/100 L water (min.1000 L/ha) Min. 2 application	weekly

PreFeRal® WG 500g

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Whiteflies

Trialeurodes vaporariorum & Bemisia tabaci



Complementary products

Bug-Scan yellow

	Size	Quantity
Monitoring	25x10 cm	25-50/ha
Mass trapping	25x40 cm 25x20 cm	50-100/ha

Bug-Scan Roll yellow

	Size	Quantity
Mass trapping (Intensive)	5 cm x100m 10 cm x125 cm 15 cm x125 cm 30 cm x100 cm	Strategic place or each row

Leaf miners

Liriomyza species




Primary product

Dacnusa sibirica

	Dose	Interval
Detection	0,25-0,5 ind./m² min. 3-4 introduction First detection of active galleries	weekly

Dacnusa system 250

Diglyphus isaea


	Dose	Interval
Detection	0,15-0,25 ind./m² min. 3-4 introduction First feeding dots & galleries	weekly

Diglyphus system 250

Complementary products

Monitoring & mass trapping

See whiteflies for yellow sticky traps.

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Aphids

Primary product

A. gossypii, Myzus persicae, Macrosiphum euphorbiae, Aulacorthum solani.

Aphidius colemani (*A.gossypii & Myzus sp.*)

	Dose	Interval
Preventive	0,25 ind./m² min. 3-4 introduction	1-2 weeks
Curative	1 ind./m² min. 3-4 introduction	weekly

Aphidius-system 500/1000/5000

Aphidius ervi (*Macrosiphum & Aulacorthum*)

	Dose	Interval
Preventive	0,15 ind./m² min. 3-4 introduction	1-2 weeks
Curative	0,5 ind./m² min. 3-4 introduction	weekly

Ervi-system 250/1000/5000

Aphidoletes aphidimyza (all aphid species)

	Dose	Interval
< 5 hot spots/ha	0,5-1 ind./m² min. 3-4 introduction	weekly
> 5 hot spots/ha	1 ind./m² min. 3-4 introduction	weekly
> 10 hot spots/ha	4 ind./m² min. 3-4 introduction	weekly

Aphidoletes-system 1000/2000/10.000

Complimentary products

Aphidius-mix Aphi-mix system***

	Dose	Interval
Preventive	0,25 ind./m² min. 3-4 introduction	1-2 weeks
Curative	1 ind./m² min. 3-4 introduction	weekly

***Aphidius-mix-system 750 (2)**
(A. colemani + A. ervi)
****Aphi-mix-system 750 (4)**
(A. colemani + A. ervi + A. matricariae + A. abdominalis)

Aphelinus abdominalis

	Dose	Interval
Curative	0,5 ind./m² min. 3-4 introduction (in case of hyperparasitism)	weekly

Aphelinus-system 250/1000

Use Biobox for release of Aphidius spp:

Bio-Box-50

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Caterpillars





Lepidoptera

Primary product

Delfin WG & Xentari WG

Delfin WG	Dose	Interval
Detection	1kg/ha??? 3 applications	weekly

Delfin WG 500g*
(Bacillus Thuringiensis ssp. kurstaki)
*** Only for Belgium & The Netherlands**

Xentari WG	Dose	Interval
Detection	750g/ha??? 3 applications	weekly

Xentari WG 500g**
(Bacillus Thuringiensis ssp. azawai)
**** Only for Belgium**

Complimentary products

Delta trap & Attract lure

Delta trap

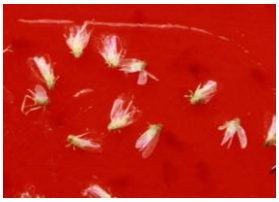
Attract lure*

	Dose	Interval
Monitoring	2 Delta traps/ha 1 Attract lure/trap. Replace the pheromone lure every 4-6 weeks	4-6 weeks

***Every pheromone is specific to a species. Consult the list of pheromones available.**

Leafhopper



Empoasca species

Sticky trap red

	Size	Quantity
Monitoring	25x20 cm	25-50/ha
Mass trapping		100/ha

Sticky trap red 25x20cm

Bug-Scan Roll red

	Size	Quantity
Mass trapping Intensive (Rolls)	10 cm x100 cm 30 cm x100 cm	Strategic place or each row

Bug Scan Roll Red 10cm x 100cm
Bug Scan Roll Red 30cm x 100cm

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Broad mites

Polyphagotarsonemus species

Primary product

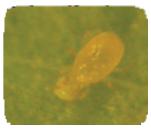
*A. swirskii**

	Dose		Interval
	1st cycle	2nd/3rd cycle	
Preventive	See thrips/ whitefly control		
Detection	100-150 ind./plant infested Min. 2 introductions		1 week

* From March to September, in warmer conditions

Swirskii system 10.000/125.000

A. cucumeris



	Dose		Interval
	1st cycle	2nd/3rd cycle	
Preventive	See thrips control		
Detection	100-200 ind./plant infested Min. 2 introductions		1 week

Amblyseius system 25.000/50.000
Amblyseius system 125.000/250.000
Amblyseius system 500.000

Pythium

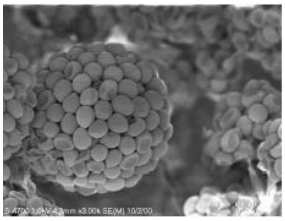
Pythium ultimum, P. aphanidermatum…

Picture

Picture

Picture

Trichoderma asperellum



Soilless

Timing	Dose	Interval
Filling of the slabs	5g/m3 substrat	
At the transplanting	5g/m3 substrat	
During the crop	10g/m3 substrat	2-3 months

Soil

Timing	Dose	Interval
At the transplanting	5g/m3 substrat 2 applications	1 week
During the crop	10g/m3 substrat	2-3 months

Asperello T34*

* Check the registration for your crop in your country.

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Pollination

Pollination (for non-parthenocarpic varieties only)

The majority of the cucumber varieties is gynoecious, with almost exclusively female flowers, and has parthenocarpic fruit set abilities.

Only non-parthenocarpic varieties, which are normally monoecious, which means that there are both male and female flowers on the same plant, require cross-pollination. The number of aborted fruit decreases as the number of flower visits by pollinating insects increases. The rate of abortion is lower with bumblebees when compared with honeybees. Bumblebees are a great tool for cucumber pollination, especially when honeybees are limited in supply.

Hive type

	Standard Hive	Premium Hive
Number of workers	80	110
Activity span	6-8 weeks	6-8 weeks
Use	General	Starter Hive

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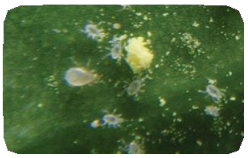
Supporting products

Food supplement



Nutrimite for *A. swirskii*

	Details	Interval
Target	Boost and enhance population development Help populations survive periods of low pest/pollen	
Dose	500g/ha/application Min. 3 applications	2 weeks

Powder Duster for Nutrimite

Bio-Bobby

Makita DUB182Z set

Aggregation pheromone

Thrips

Thripher

	Details	Interval
Target	Aggregation pheromone for *Frankliniella occidentalis* Lure thrips out of their hiding places; quicker and earlier detection Combine with blue sticky traps	
Dose	1 lure + 1 blue sticky trap	3-4 weeks

Thripher 10 lures

Monitoring tool

Picture signal clip in a cucumber crop

Signal Clip

	Details
Target	Clip to attach to the crop wire Indicator clip for easy detection of hotspots of pests in the crop
Dose	1 clip per hotspot

Signal clips 50 (same colour)
(red, yellow, orange, green, blue, purple)
Each colour is linked to a pest

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