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CROP INFO SHEET

SWEET & HOT PEPPERS



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IPM strategy for sweet & hot peppers

SWEET & HOT PEPPERS



Support your health

There are many therapeutic and medical qualities attributed to peppers. The more colorful the pepper, the more nutritional value it has. They contain more vit. C than oranges. Peppers are also a good source of vit. A and B complex, and minerals such as potassium and iron. They are high in antioxidants too. Especially the hot peppers are particularly rich in capsaicin, which has a pain relieving, expectorant and diuretic effect.

What's the benefit of using bumblebees for natural pollination?

Under conditions of low light densities the flower morphology does not guarantee self-pollination. The use of bumblebees as natural pollinators offers a solution and creates an improvement of fruit quality and a substantial increase in yield.

Why developing integrated pest management (IPM) for your pepper crops?

The main disadvantages of applying pesticides are pest resistance and chemical residues. Pesticides are also resulting to be less available due to decreasing effectiveness, imposed restrictions and even withdrawal from the market. Also the release of new active ingredients is submitted to strict regulations which results often in long term registration procedures.

IPM is a sustainable crop protection technique.

The use of natural organisms for pest control ensures a healthy crop by excluding the use of harmful and persisting chemicals.

Implementing IPM strategies results into a reduction of pesticide use, residue free produce, safer working environment for the employees, compatibility with bumblebees and beneficial organisms and a better fruit quality.

Due to the increasing awareness of the general public to food safety and environmentally friendly production, as well as the globalization of export markets, IPM strategies can be used as an important marketing tool.

Technical advice

This crop info sheet is a tool intended to explain growers about the use of our products; target pest and dosages. The technical advice exposed in these sheets is based on a general strategy for areas with a temperate climate in Europe, and may vary from your specific situation and condition.

Check for product authorization and legislation in your country with the local authorities.

Contact your nearest Biobest advisor to discuss an appropriate strategy to your conditions.

Advantages

- Residue free
- Food Safety
- Environmental friendly
- Sustainable crop protection

POLLINATION



Benefits of using bumblebee hives

Flowers of peppers are self-pollinating. Depending on the variety and the season, bumblebee pollination may be desirable. Especially in late winter and early spring period, under low light densities, the position of the stamen can be not adequate to insure self-pollination. In those periods of difficult fruit setting, the use of bumblebees on peppers has been proven to result in bigger yields, bigger fruits and less deformed fruits.

Hive type

	Standard Hive	
Number of workers	60	
Activity span	6-8 weeks	
Dosage	1 Hive / 3.000 – 5.000 m ²	



THRIPS



The dosage is based on a standard advice, please check with your advisor to discuss the strategy adapted to your situation

Pest

Frankliniella occidentalis



Egg



Larvae



Pré-pupa



Adult

Damages



Leaf damage



Fruit damage



Damage on fruit stalk



TSW on leaf



TSW on fruit

Biocontrol agents



Orius-System
(*Orius laevigatus*)
Predatory bug
Target: nymphs and adults
Dosage: 0,5 ind./m²/week, min. 2 x
Timing: at first blooming



Amblyseius-System
(*Amblyseius cucumeris*)
Predatory mite
Target: larvae and nymphs
Dosage: min. 100/m², in and around
hot spots and sensitive areas
Timing: when hot spots appear



Amblyseius-Breeding-System
(*Amblyseius cucumeris*)
Predatory mite
Target: larvae and nymphs
Dosage: 1 sachet/5 plants
Timing: from first blooming and leaf touching



Degenerans-System
(*Amblyseius degenerans*)
Predatory mite
Target: larvae and nymphs
Dosage: min. 0,25 ind./m², min. 4x
Timing: at first blooming



Swirskii-System
(*Amblyseius swirskii*)
Predatory mite
Target: larvae and nymphs
Dosage: min 50 ind./m², in and around hot spots
and sensitive areas
Timing: when hot spots appear



Swirskii-Breeding-System
(*Amblyseius swirskii*)
Predatory mite
Target: larvae and nymphs
Dosage: 1 sachet/5 plants
Timing: from first blooming and leave
touching

THRIPS



Monitoring & Scouting



Bug-Scan Blue

Blue sticky traps
Goal: monitoring adult thrips
Dosage: 20-40 traps/ha



Signal Clip Blue

Goal: Indicator clip for hot spots of thrips
in the crop
Dosage: 1 clip per hot spot



Thipher

Pheromone *F. occidentalis*
Goal: to lure thrips out of their shelters;
quicker and earlier detection
Dosage: 1 capsule/100m²,
plug on blue sticky trap

WHITEFLY



The dosage is based on a standard advice, please check with your advisor to discuss the strategy adapted to your situation

Pest



Egg

Trialeurodes vaporariorum

Bemisia tabaci



Larvae



Adult



Damages



Honeydew and sooty mold

Biocontrol agents



Encarsia-System
(*Encarsia formosa*)

Parasitic wasp
Target: *T. vaporariorum* (L3-L4)
Dosage: 3-4 ind./m²/week, min. 4x
Timing: at first sign of whitefly larvae



Eretmocerus-System
(*Eretmocerus eremicus*)

Parasitic wasp
Target: *T. vaporariorum* & *B. tabaci* (L2-L3)
Dosage: 2-3 ind./m²/week, min 4x
Timing: - in summer time
- at mixed whitefly population



Eretmix-System
(*E. formosa* + *E. eremicus*)

Parasitic wasp
Target: *T. vaporariorum* & *B. tabaci* (L2-L4)
Dosage: 3-4 ind./m²/week, min. 4x
Timing: - during transition period from spring to summer
- releases at mixed whitefly population



Mundus-System
(*Eretmocerus mundus*)

Parasitic wasp
Target: *B. tabaci* (L2-L3)
Dosage: 3 ind./m²/week, min. 4x
Timing: at first sign of *Bemisia* larvae



Swirskii-System
(*Amblyseius swirskii*)

Predatory mite
Target: larvae and nymphs
Dosage: min 50 ind./m², in and around hotspots and sensitive areas
Timing: according to thrips control strategy



Swirskii-Breeding-System
(*Amblyseius swirskii*)

Predatory mite
Target: larvae and nymphs
Dosage: 1 sachet/5 plants
Timing: according to thrips control strategy

WHITEFLY



Biocontrol agents



PreFeRal
(*Paecilomyces fumosoroseus* strain Apopka 97)
Entomopathogenic fungus
Target pest: *T. vaporariorum* & *B. tabaci* (larvae & adults)
Dosage: 100 gr/100L water, min. 1.000L/ha
Timing: corrective treatment

Monitoring & Scouting



Bug-Scan Yellow
Yellow sticky traps
Goal: monitoring adult whiteflies
Dosage: 20-40 traps/ha



Signal Clip Yellow
Goal: Indicator clip for hotspots of whiteflies larvae in the crop
Dosage: 1 clip per hot spot

APHIDS



The dosage is based on a standard advice, please check with your advisor to discuss the strategy adapted to your situation

Pest



Foxglove aphid
(*Aulacorthum solani*)



Potato aphid
(*Macrosiphum euphorbiae*)



Peach aphid
(*Myzus persicae*)



Cotton aphid
(*Aphis gossypii*)

Damages



Infested flower



Infested leaves



Honeydew on leaves



Leaf discoloration

Biocontrol agents



Aphidius-System
(*Aphidius colemani*)
Parasitic wasp
Target: *Myzus persicae*, *Aphis gossypii*
Dosage: 0,5 ind./m²/week, min. 4 x
Timing: at first sign of aphids



Matricariae-System
(*Aphidius matricariae*)
Parasitic wasp
Target: *Myzus persicae* and related species
Aulacorthum solani
Dosage: 0.25 ind./m²/week, min. 4x
Timing: at first sign of aphid



Ervi-System
(*Aphidius ervi*)
Parasitic wasp
Target: *Aulacorthum solani*,
Macrosiphum euphorbiae (*)
Dosage: 0.25 ind./m²/week, min 4x
(*double dosage needed)
Timing: at first sign of aphids



Aphidoletes-System
(*Aphidoletes aphidimyza*)
Predatory gall midge
Target: most aphid species
Dosage: <5 hot spots/ha: 0.5-1 ind./m²/min. 4x
>5 hot spots/ha: 1 ind./m²/week, min. 4x
>10 hot spots/ha: 4 ind./m²/week, min. 4x
Timing: in support of parasitic wasp



Aphelinus-System
(*Aphelinus abdominalis*)
Parasitic wasp
Target: *Aulacorthum solani*, *Macrosiphum euphorbiae*, *Myzus persicae*
Dosage: 0.25 ind./m²/week, min. 4x
Timing: in case of hyperparasitism



Banker-System-E
Banker plant for *A. ervi*
Target: *Aulacorthum solani*, *Macrosiphum euphorbiae*
Dosage: 3 units + 1 Ervi-System/ha/week, min. 4x
Timing: preventive

APHIDS



Monitoring & Scouting



Bug-Scan Yellow

Yellow sticky traps

Goal: monitoring winged aphids

Dosage: 20-40 traps/ha



Signal Clip Green

Goal: Indicator clip for hotspots of aphid in the crop

Dosage: 1 clip per hot spot

TWO SPOTTED SPIDER MITE



The dosage is based on a standard advice, please check with your advisor to discuss the strategy adapted to your situation

Pest

Tetranychus urticae



Egg



Nymph



Adult

Damages



Leaf discoloration



Webbing on leaf



Severe damage

Biocontrol agents



Phytoseiulus-System (*Phytoseiulus persimilis*)

Predatory mite
Target: all stages of *T. urticae*
Dosage: 6 ind./m², full field introduction
min. 20 ind./m², in hot spots,
repeat if necessary
Timing: at first sign of spider mites



Californicus-System (*Amblyseius californicus*)

Predatory mite
Target: all stages of *T. urticae*
Dosage: 4 ind./m², repeat if necessary
Timing: in case of low relative
humidity



Feltiella-System (*Feltiella acarisuga*)

Predatory gall midge
Target: all stages of *T. urticae*
Dosage: low infestation: 2-3 x 250 ind./ha/week,
in hot spots
high infestation: 8 x 250 ind./ha/week,
min. 4x, in hot spots
Timing: in support of Phytoseiulus-System

Monitoring & scouting



Signal Clip Red

Goal: Indicator clip for spider mite hot spots
Dosage: 1 clip per hot spot

LEAFMINER



The dosage is based on a standard advice, please check with your advisor to discuss the strategy adapted to your situation

Pest

Liriomyza spp.



Larva



Pupa



Adult

Damages



Galleries

Biocontrol agents



Diglyphus-System (*Diglyphus isaea*)

Parasitic wasp

Target: leaf miner larvae

Dosage: 0,1-0,25 ind/m²/week, min. 4 x

Timing: at general appearance of galleries

Scouting & monitoring



Bug-Scan Yellow

Yellow sticky traps

Goal: Monitoring adult leaf miner

Dosage: 20-40 traps/ha



Signal Clip Orange

Goal: indicator clip for leaf miner hot spots (feeding dots and galleries) in the crop

Dosage: 1 clip per hot spot

CATERPILLAR



The dosage is based on a standard advice, please check with your advisor to discuss the strategy adapted to your situation

Pest



Damages



Leaf damage



Fruit damage

Monitoring & scouting



Delta trap

Pheromone trap, triangle shaped

Goal: monitoring moth

Dosage: 2 traps/ha



Attract lure

Pheromone lure

Dosage: 1 per trap, replace every

4-6 weeks



Signal Clip Purple

Goal: Indicator clip for feeding damage and presence of caterpillars in the crop

Dosage: 1 clip per hot spot