WHEN USING CHEMICALS, PLEASE CHECK THEIR COMPATIBILITY WITH OUR BENEFICIAL INSECTS ON OUR WEBSITE WWW.BIOBEST.BE

biobest®
SUSTAINABLE CROP MANAGEMENT

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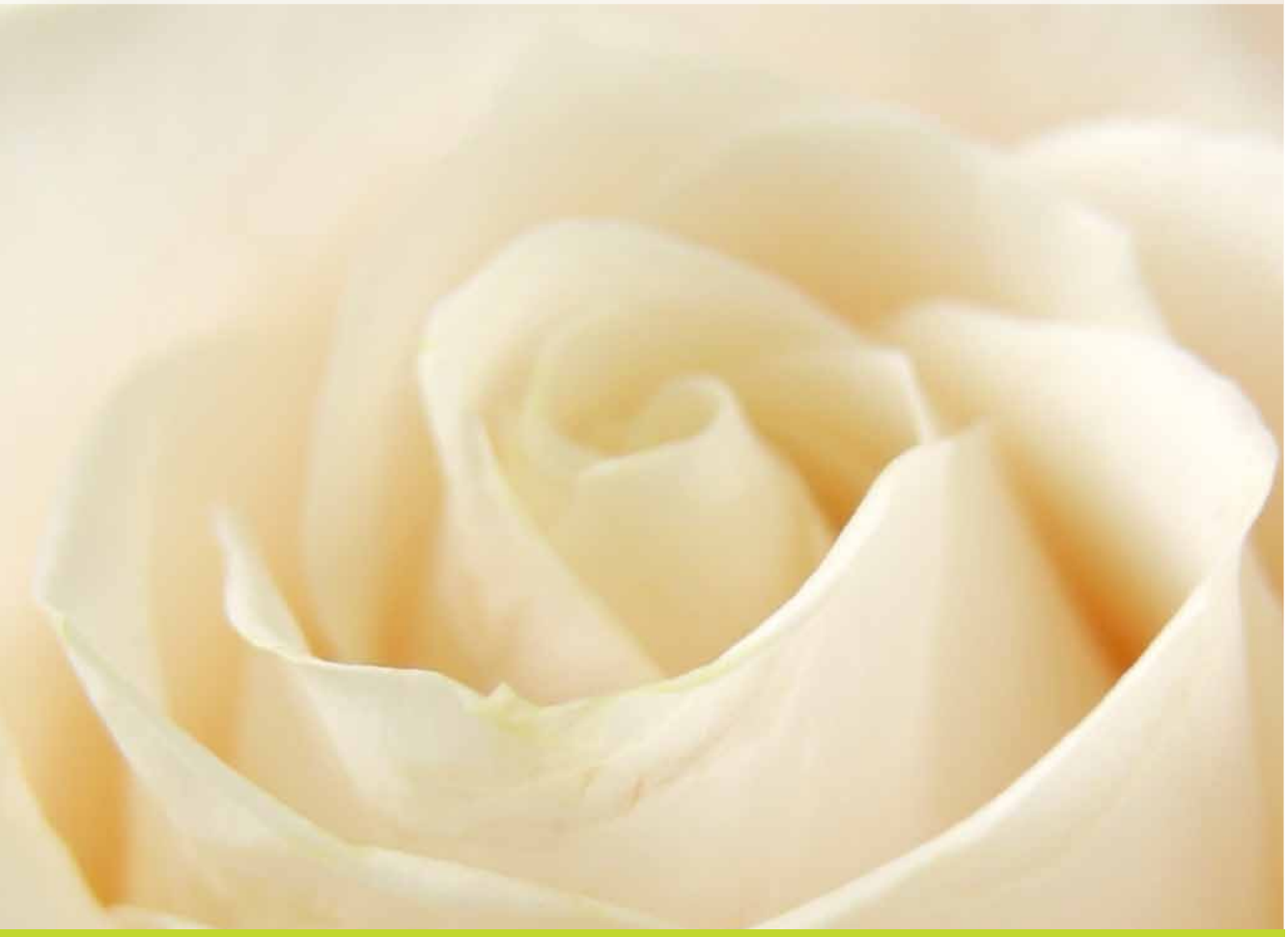
CROP INFO SHEET

CUT ROSES



IPM strategy for cut roses

CUT ROSES

Why developing integrated pest management in cut roses?

In recent years, we saw a dramatic increase of pesticide resistance.
For some of these pests, it is almost impossible to control them with chemical products (pesticides). The consensus is that for today's cut rose grower, it is simply more economical to use IPM (Integrated Pest Management) than only chemical control:

- ✓ Fewer effective chemical products available on the market.
- ✓ The huge problem of resistance making Integrated Crop Protection the cheaper and most effective option. The best way to prove this is with two spotted mite control.
- ✓ A healthy work environment for your staff.
- ✓ Opportunities to obtain sustainable labels, becoming more and more important in the marketing of products.
- ✓ Integrated control is more stable control than chemical. Beneficial organisms in the crop establish and persist in the crop. They offer long-lasting control instead of periodic chemical treatments.
- ✓ Stronger crop! Less spraying means more growth, more growth means more yield more yield means, ...
- ✓ If you are able to delay many chemical corrections you will find that the chemical compounds work better because the pest has not been exposed to them for many pest generations.

Advice

This leaflet is a tool intended as an explanation to growers about our products that they can use against each pest present in their rose crops. The advice is based on a general strategy for areas with a temperate climate in Europe, and may vary from you specific situation. Contact your advisor to discuss an appropriate strategy to your conditions.

CROP INFO SHEET CUT ROSES

THRIPS

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

Pest

- Western flowerthrips (*Frankliniela occidentalis*)
- Greenhouse thrips (*Heliothrips haemorrhoidalis*)
- Rose thrips (*Thrips fuscipennis*)

Larva

Pre-pupa

Adult

Damages

Biocontrol agents

Orius-System
(*Orius majusculus*)
Semi-preventive: (thrips must be present) 1 to 3/m²
Summer period is from weeks 12 to 34

Amblyseius-System or Amblyseius-Breeding-System
Preventive: ABS1 ABS*/1,5 m²
Curative: 150 to 500 ind/m²

Swirskii-Breeding-System or Swirskii-System (*A. swirskii*)
Preventive: summer period 1 SBS/1,5m²/8 weeks
Curative: summer 100 to 300 mites/m²

Atheta-System
(*Atheta coriaria*)
Preventive 1 *Atheta*/m²

Hypoaspis-System
(*Hypoaspis miles*)
Preventive: 250/500 m²
Curative: 500/m²

Biocontrol corrections

Thripher
Whole year
1 dispenser/100 m²
Change dispenser every 6 weeks

Biosweet
Soap spray
200 ml/100l water

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CROP INFO SHEET CUT ROSES

THRIPS

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

Scouting & monitoring

Monitoring of thrips is done with the use of blue sticky traps, observation of damage on flower buds and eventually controle of thrips presence in ripe flowers in the bent stems.

The best way to monitor thrips is to count weekly the number of thrips caght on the sticky traps.

Rollertrap Blue can be used to mass trap trips. They can be hung in strategic places such as corridors and edges of the greenhouse. In case of high infestation it may be advisable to hang a rollertrap above each row.

CROP INFO SHEET CUT ROSES

WHITEFLY

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

Pest

- Greenhouse whitefly (*Trialeurodes vaporariorum*)
- Tabaco whitefly (*Bemisia tabaci*)

Egg

Larva

Adult

Damages

Biocontrol agents

Encarsia-System
(*Encarsia formosa*)
Weekly full field introduction 6 wasps/m²
Switch to 3/m² when first parasitic wasps appear

Swirskii-Breeding-System or Swirskii-System (*A. swirskii*)
Preventive: already in the crop (see thrips program)
Curative: ±100/m² in and around hot spots

Eretmocerus-System
(*Eretmocerus eremicus*)
Weekly full field introduction 6 wasps/m²
Switch to 3/m² when first parasitic wasps appear

Delphastus-System
(*Delphastus pusillus*)
Use only in hotspots, 25/hot spots continue minimum 3 to 5 weeks

Mundus-System
(*Eretmocerus mundus*)
Weekly full field introduction 6 wasps/m²
Switch to 3/m² when first parasitic wasps appear

Scouting & monitoring

The best way to monitor whitefly is to count the number of adults on yellow sticky traps. Based on these yellow sticky traps you can locate sensitive areas for the whitefly.

In sensitive areas it may be advisable (e.g. edges of the greenhouse) to hang rolls of yellow sticky ribbon to mass trap the majority of the adult whitefly.

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CROP INFO SHEET CUT ROSES

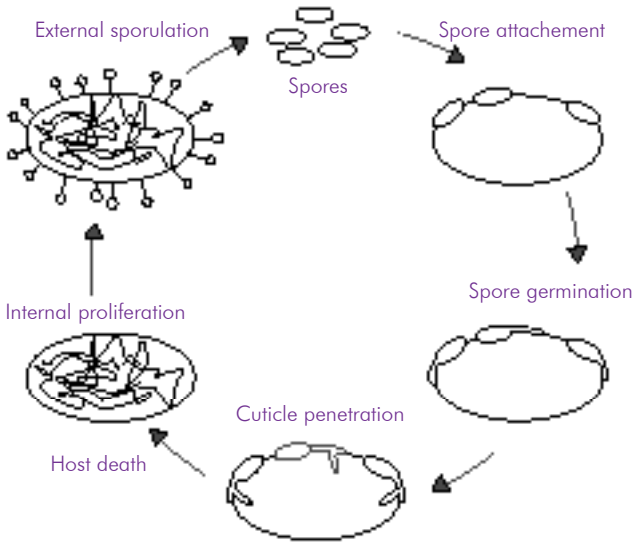
WHITEFLY

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

Biopesticides

PreFeRal
100 gr/100L water, spray minimum
3000 L/Ha

- PreFeRal® WG contains spores of a naturally-occurring strain of the fungus *Paecilomyces fumosoroseus*. This fungus is highly efficient against the greenhouse whitefly and can infect all stages (egg, larva, pupa and adult) of this pest.
- The spores adhere to the different stages of the whitefly. After germination, the fungus penetrates the whitefly, which ultimately results in the death of the insect.
- The fungus grows inside the host (internal proliferation). Under optimal conditions, the fungus forms mycelium <and sporulates on the outside of the insect cadaver (external sporulation; visible as white-grey coloured mildew), releasing new spores. These spores will spread through the greenhouse and infect other whiteflies. The establishment of the fungus in the greenhouse will provide prolonged whitefly control.
- Under suboptimal conditions, the mycelium will not become visible on the outside of the insect. The fungus will cause mortality which can be recognized as deformed insects which turn brown.
- PreFeRal® WG will not immediately kill all insects, but gradually reduce the whitefly population for several weeks after application.



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CROP INFO SHEET CUT ROSES

SPIDER MITE

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

Pest

Two spotted spider mite (*Tetranychus urticae*)

Nymph

Adult and egg

Webbing

Damages

Biocontrol agents

Feltiella-System
(*Feltiella acarisuga*)
Curative light infestation
row. Always place the bucket under hotspots
Need high humidity

Phytoseiulus-System
(*P. persimilis*)
Curative light infestation
Immediately when tw spotted spider mite is present 20 to 30/m² repeat 2 to 3 weeks until control. In hotspots 100/m².

Swirskii-Breeding-System or Swirskii-System (*A. swirskii*)
Works preventive on mites as a 'hand brake' but is not good enough to control. *Swirskii* is already in the crop (see thrips program)

Fallacis-System
(*A fallacis*)
Preventive: 20/m²
Curative: 50/m²

Californicus-System or Californicus-Breeding-System (*Amblyseius californicus*)
Preventive: 20/m²
Curative: 50/m²
Sachets can be used preventive in expected hot spots early in the season

Andersoni-System or Amblyseius-Breeding-System (*Amblyseius andersoni*)
Preventive: 20/m²
Curative: 50/m²

Scouting & monitoring

Spider mites are not noticeable on sticky traps, therefore it is important to scout in the crop and check leaves for present symptoms. Pay special attention to areas close to the doors and edges of the greenhouse. Spider mite control will benefit from reduced or suppression of sulphur.

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APHIDS

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

Pest

- Rose aphid (*Macrosiphum rosae*)
- Potato aphid (*Macrosiphum euphorbiae*)
- Foxglove aphid (*Aulacorthum solani*)
- Bean aphid (*Aphis fabae*)

Damages

Biocontrol agents

Aphidius-System (*A. colemani*)
for *Aphis gossypii* & *Myzus* sp.
Curative: 0,25 to 1,5 ind/m²

Ervi-System/Aphelinus-System
(*A. ervi* or *A. abdominalis*)
for *Rhodobium porosum*, *Macrosiphum* sp., *Aulacorthum solani*
for the last one, only *A. ervi*
Curative : 0,25 to 1,5 ind/m²

Matricariae-System (*A. matricariae*)
for *Aulacorthum*, *Aphis* sp. & *Myzus* sp.
Curative: 0,25 to 1,5 ind/m²

Adalia-System (*A. bipunctata*)
Curative: 10 to 20 ind/m²
(concentrate on hot spots)

Aphidoletes-System (*A. aphidimiza*)
Not compatible with *Swirskii*
Preventive: 0,25 ind/m²
Curative: repeat between 2 to 4 times depending on the pressure of the pest

Chrysopa-System (*C. carnea*)
Curative: 20 to 40 ind/m²
(focus the release on hot spots)

* ask your advisor to know which mix of parasitoids would be the most adapted to your conditions

Scouting & monitoring

Scout on rose buds while harvesting. Only winged aphids are noticeable on sticky traps. As soon as they are found on the traps, give extra attention on flower buds.

Aphids can be recognized by their white cast skins and by the sticky substance, the honeydew they excrete.

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CATERPILLARS

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

Pest

Damages

Biopesticides

Xentari
100gr/100l curative
XenTari is a biological compound based on spores of the bacteria *Bacillus thuringiensis var. aizawai* (Bt). XenTari works against several species of butterfly and moth caterpillars that can cause serious damage to crops. The product is a water dispersible granule. By eating sprayed parts of the plant the caterpillars digest the bacteria. Inside the caterpillar's intestines, the bacteria produce spores and protein crystals.

While digesting crystals in the intestinal canal, a harmful toxin is released. This toxin damages the intestinal wall and stops the caterpillar from eating as soon as one hour after intake, as the jaws become paralysed. Infected caterpillars move slowly, change colour and shrivel. They die 2 to 5 days after intake of the bacteria. Dead specimen hang with their hind legs still attached to leaves.

XenTari has a persistence period of 10 days: because young caterpillars are located on the youngest leaves, repeating the treatment strongly depends on their speed of growth. In open field cultures the treatment must be repeated after rain.

Scouting & monitoring

Look for holes and excrements on the leaves.

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MEALYBUG

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

Pest

Nymph (Crawler)

Adult

Damages

Beneficial insects

Cryptolaemus-System
(*C. montrouzieri*)
Repeat curative introductions on hotspots

Chrysopa-System
(*C. carnea*)
Prevantive and curative
on hot spots 10/m²/week

Scouting & monitoring

Scout for mealybugs on the woody parts of the plant. Often they live a long hidden life close to the plug on the wood of the plant (the root interface?) and in the armpit of the twigs that bent down.

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