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Biological Aphid Control

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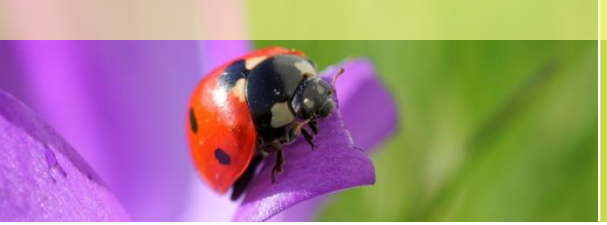
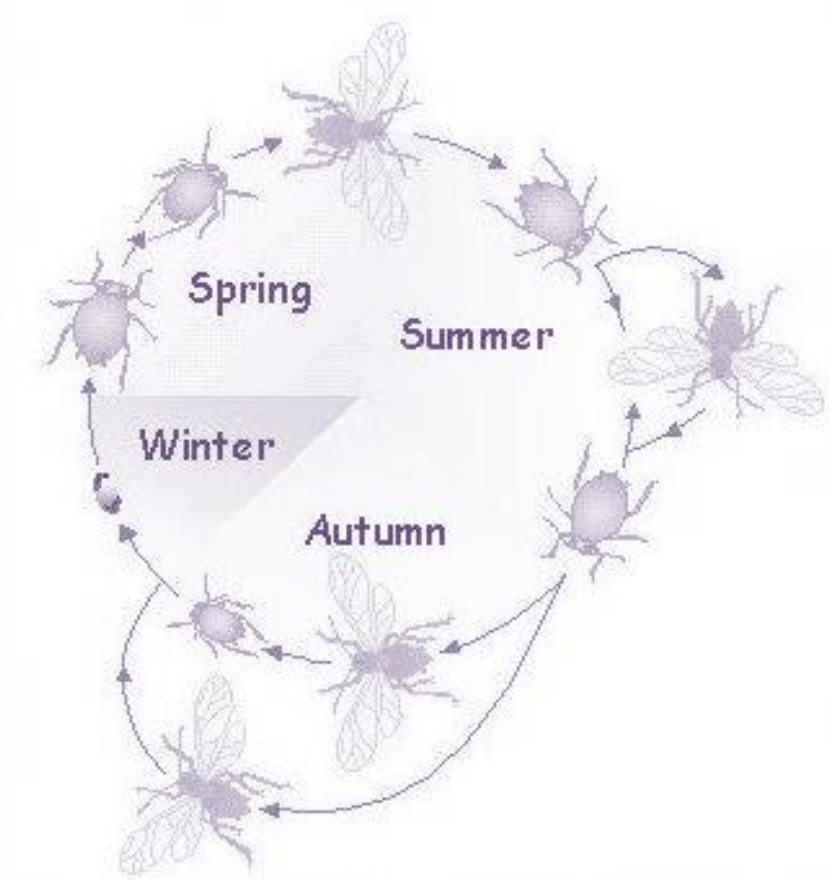
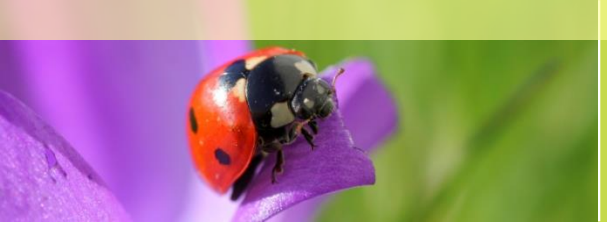
SUSTAINABLE CROP MANAGEMENT



Aphids: hard to control

- Major pests of many (greenhouse) crops
- Virus vectors
- Honeydew and sooty molds
- Rapid aphid reproduction
- Polymorphism
- Hyper parasitism
- Low temperatures for beneficials to function
- Low tolerance





Aphid biological control strategy

Preventative

- Thorough monitoring
- Banker plants
- *Aphidoletes* pupae
- Aphidius spp.
- *Sphaerophoria rueppellii*
- *Macrolophus pygmaeus*

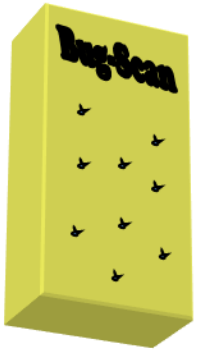
Curative

- *Aphidius* spp.
- *Chrysoperla carnea*
- Coccinelids

Affected crops

Thorough monitoring

- Early detection of pest on traps



(alate form: 2 pairs of wings double the body length)

- Detection of pest (symptoms)

Aphidoletes aphidimyza pupae

High prey detection efficacy:
oviposition on infected plants

Banker systems

Predatory larvae emerge from eggs
and consume 10-100 aphids
(> 60 different species)

Hover flies: *Sphaerophoria rueppellii*

Syrphids: predatory larvae and nectar/pollen feeding adults

S. rueppellii

E. corollae

- *S. rueppellii* naturally more abundant @ high temperatures <>*E. corollae* naturally more abundant when temperatures are low/ beginning of the season

- *S. rueppellii* better population build up on lower pest availability -> more preventative introductions

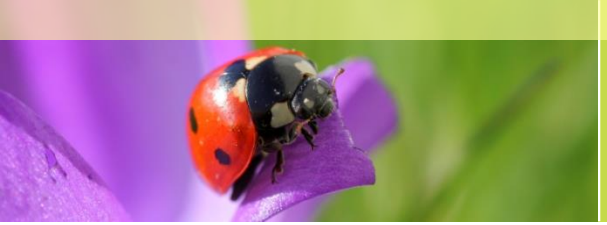
Sphaerophoria rueppellii

Female. Slender long body with black and yellow streaks.

Eggs: white and elongated

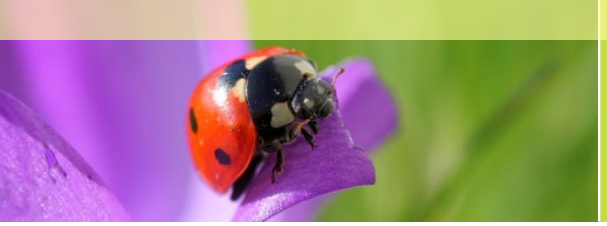
Pupae: green and dark brown occassionally

Larvae: usually green with 2 white lines.

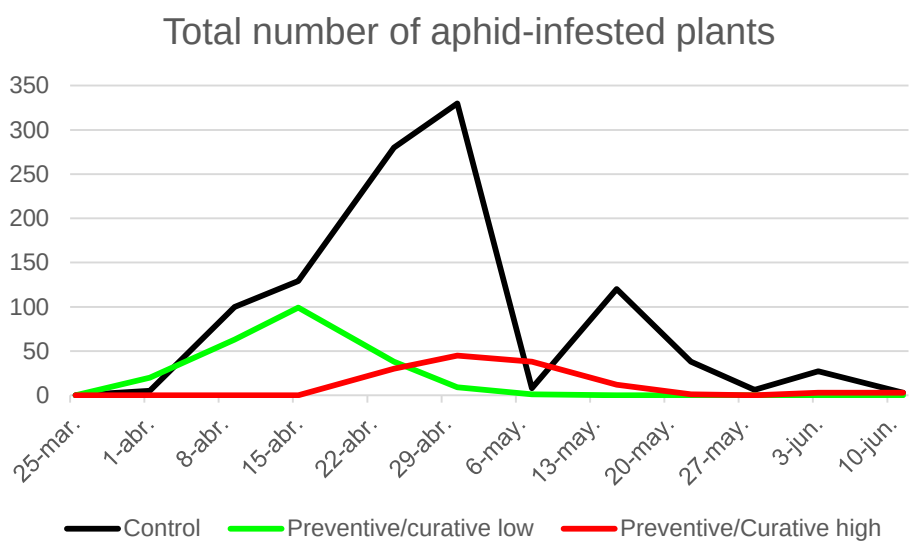


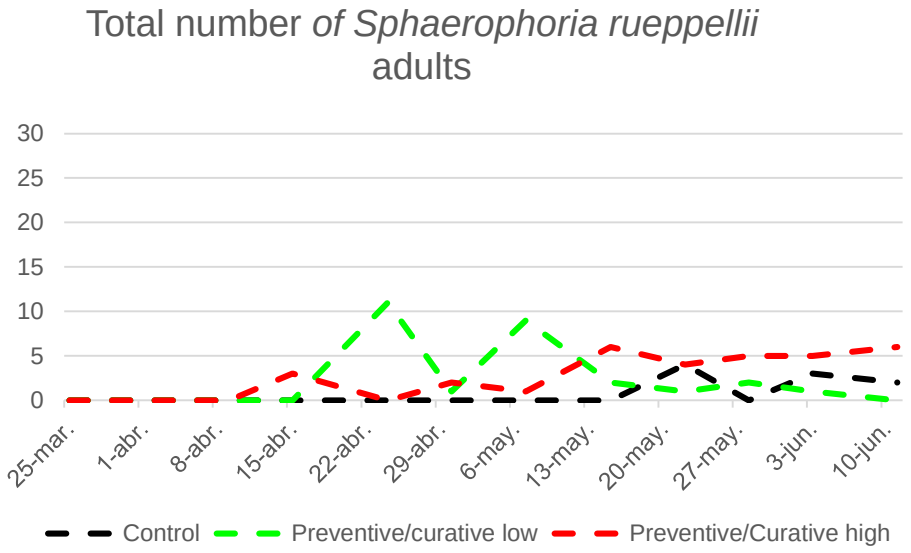
Field experience 2015

Organic sweet pepper greenhouse



Observations



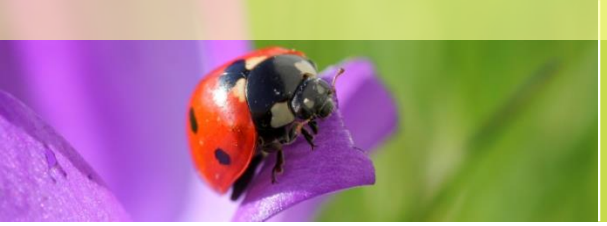


Preventative and Curative *Low Dose* (100 + 300 pupae/ha/week)
Preventative and Curative *High Dose* (200 + 600 pupae/ha/week)

Conclusions Field experience 2015

- *S ruepellii* release as pupae establish a population without bankerplants/flowers in sweet-pepper

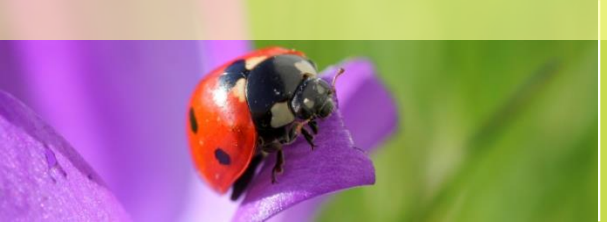
- *S. rueppellii* was effective in controlling *Myzus persicae nicotianae, Aphis craccivora, Aphis gossypii* and *Macrosiphum euphorbiae*



Predatory bug: Macrolophus pygmaeus

Can be established preventatively through the use of
factituous prey (e.g. Ephestia eggs or Artemia cysts)

Can survive in absence of prey on plants only



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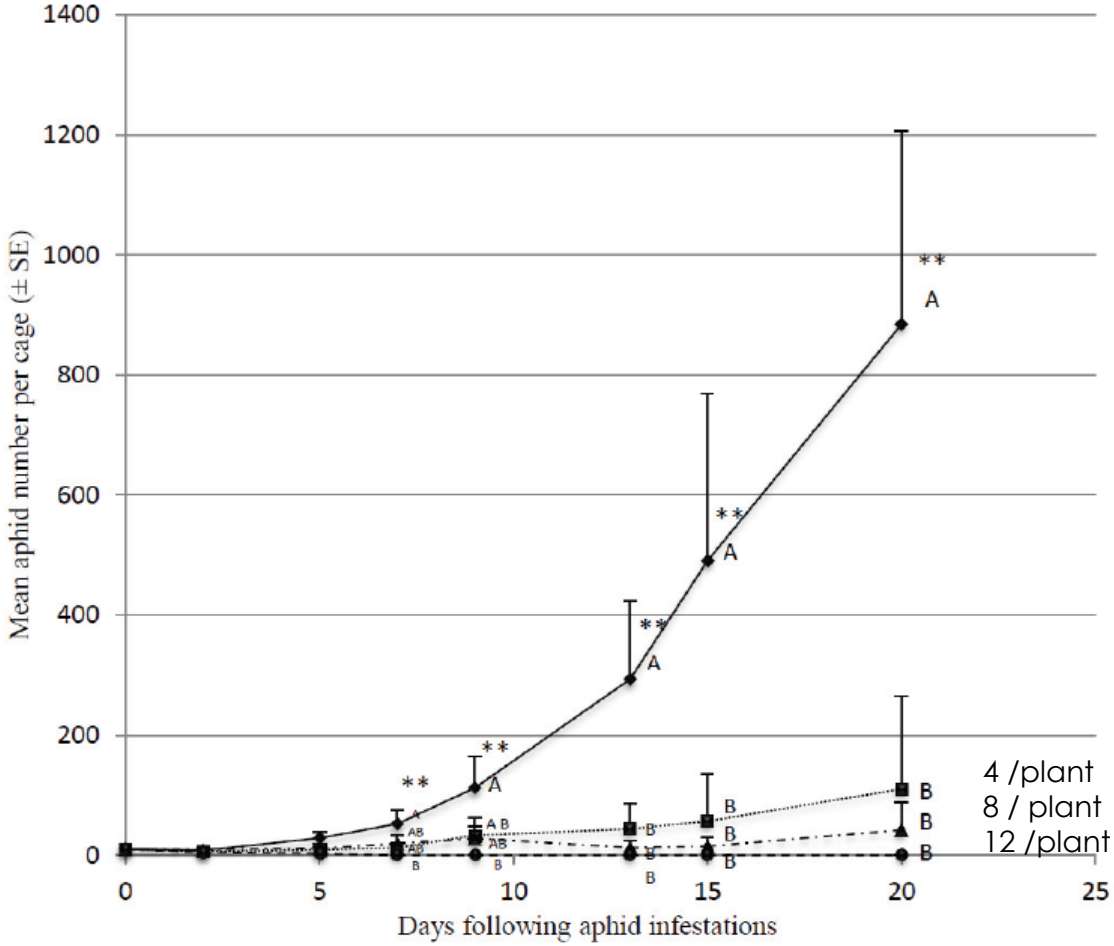
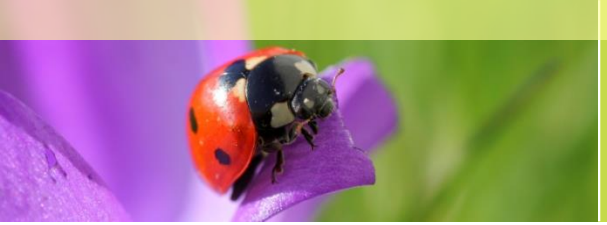


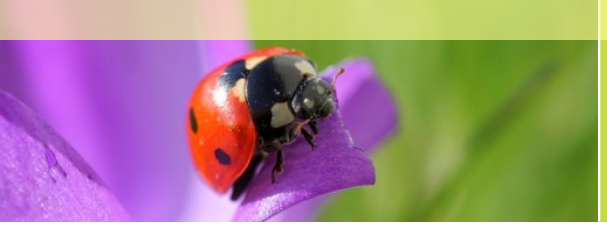
De Backer *et al ., 2015*



Predatory bug: Macrolophus pygmaeus

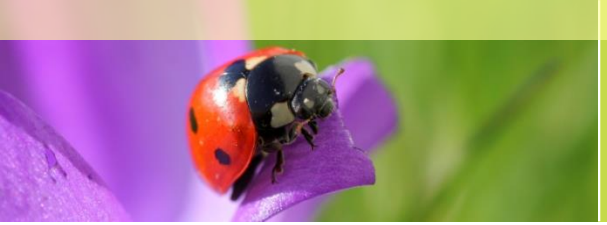
Preventive application of *M. pygmaeus*, along with a supplementary food source, assists control early infestations of aphids (*M. persicae*) in sweet pepper.

De Backer *et al ., 2015*



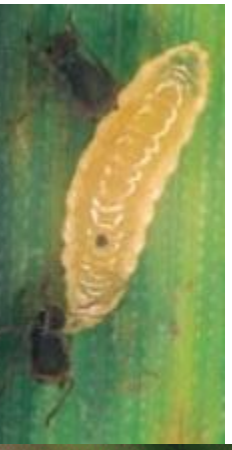
Summary

	Predation	Number of eggs	Parasitizing/ predation
Aphidoletes aphidimyza	10-100	70-200	-
Chrysoperla carnea	300-600	400-500	-
S. rueppellii	300-500	500-1000	-
Adalia bipunctata	>1000	1500	-
Aphidius colemani	-	-	300
Aphidius ervi	-	-	100-300
Aphelinus abdominalis	-	-	250
Aphidius matricariae	-	-	100-300



Overall conclusion aphid control

Early detection and a **combination of IBCAs** are key to effective biological aphid control

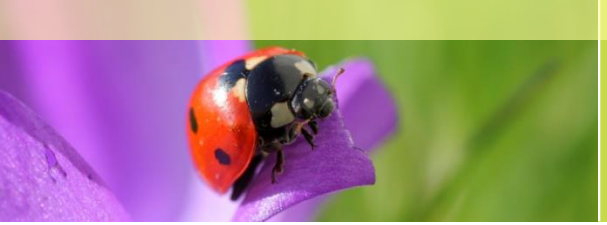


Preventative

Aphidoletes pupae
Aphidius
Sphaerophoria rueppellii

Curative

Chrysopa
Aphidius
Coccinelids



Thank You