



FresaProtect:

The use of a cocktail of parasitoids against aphids in strawberries – a case study

Viridaxis

- Company based in Belgium
- Specialized in the production of aphid's parasitoids
- Cooperative link with the UCL Ecology and Biogeography Laboratory
- Unique method of production based on new technologies
- Generalized use of artificial breeding media
- Rapidly growing product range

Viridaxis

- 1998-2004: UCL: Research program
- 2004: Company creation
- 2005: Installation in Gilly. Production and commercialization of *A. colemani*
- 2006: Small scale production of *A. matricariae*, *A. ervi* and *E. cerasicola*
- 2007: Small scale production of *P. volucre*.
- 2008: Commercialization of *A. ervi*. Development of FresaProtect.
- 2009: Small scale production of *A. abdominalis*.
- 2010: Commercialization of FresaProtect

Objectives of FresaProtect

- Easy and quick to install
- No identification of the aphids needed
- No worries after installation
- Easy follow-up
- No resistance to be feared
- No aphicide residue on the fruits
- Continuous presence of the parasitoids
- Compatible with integrated protection scheme
- Accessible to every grower

FresaProtect: Project phases

- 1.A: Harvest of the parasitoids (2007)
- 1.B: Rearing of the parasitoids (2007)
- 2: Selection of parasitoids with interesting host range (2007)
- 3: Cages trials (2007-10)
- 4: Semi field trials (2007-10)
- 5: Field trials (2007-10)

FresaProtect: Parasitoids used

- *Aphidius ervi*
- *Aphidius colemani*
- *Aphidius matricariae*
- *Ephedrus cerasicola*
- *Praon volucre*
- *Aphelinus abdominalis*



FresaProtect: Aphids-parasitoids relations

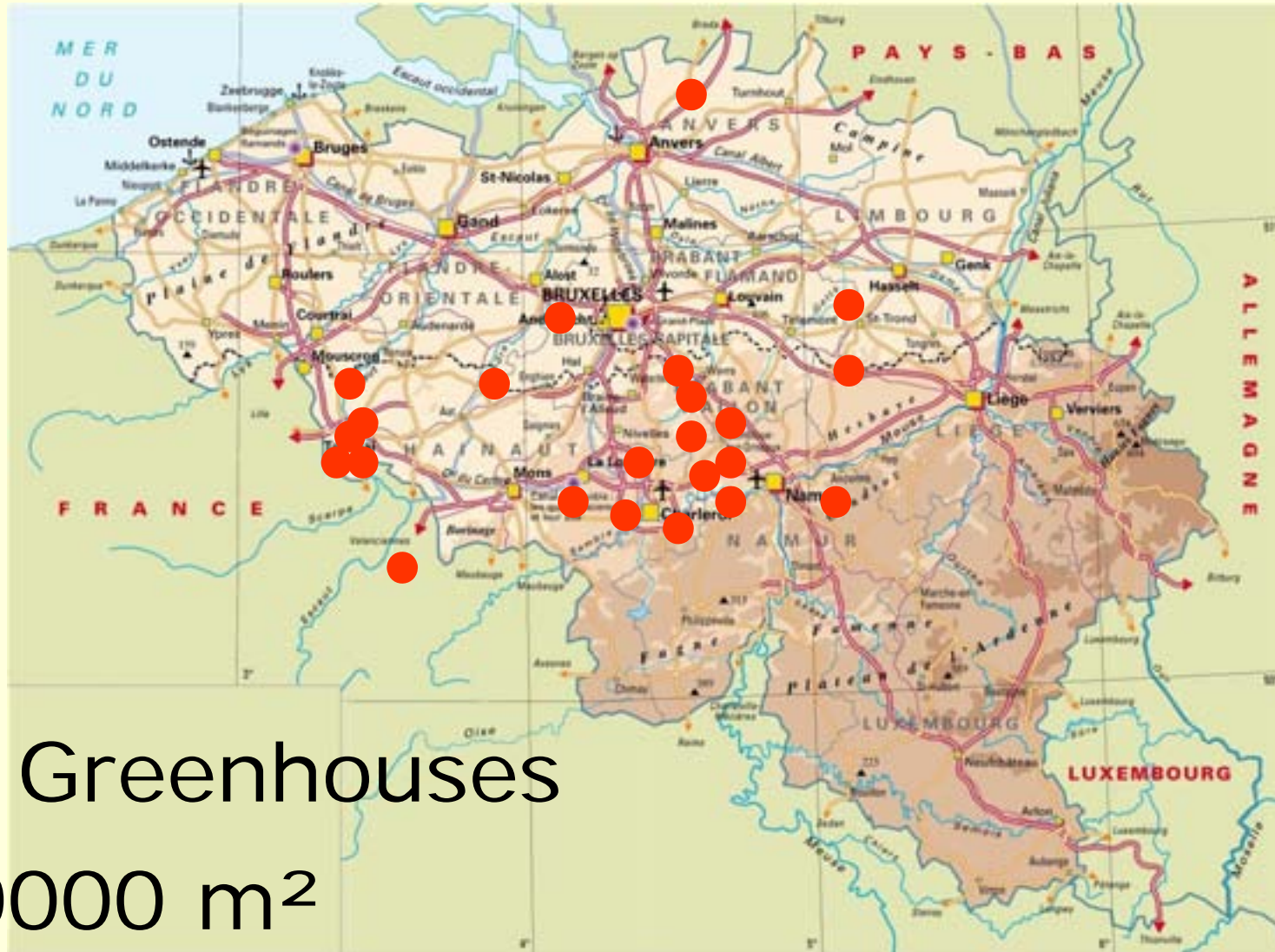
Aphid/parasitoid	A. <i>ervi</i>	A. <i>matricariae</i>	E. <i>cerasicola</i>	P. <i>volucre</i>	A. <i>colemani</i>	A. <i>abdominalis</i>
<i>Acyrtosiphon malvae</i>	xx			xxx		
<i>Aphis craccivora</i>		xx		x	xxx	
<i>Aphis fabae</i>		x		x	(x)	
<i>Aphis forbesi</i>		(x)			(x)	
<i>Aphis gossypii</i>		xxx	(x)	x	xxx	
<i>Aphis nasturtii</i>		xx		x		
<i>Aphis ruborum</i>		xx			xx	
<i>Aulacorthum solani</i>	xx	(x)	xxx	xx		xx
<i>Chaetosiphon fragaefolii</i>			(x)	(x)		(x)
<i>Macrosiphum euphorbiae</i>	xxx			xxx		xxx
<i>Macrosiphum rosae</i>	xx			xxx		xx
<i>Myzus ascalonicus</i>		(x)	(x)	(x)		
<i>Myzus persicae</i>	x	xx	xx	xx	xxx	xx
<i>Rhodobium porosum</i>	xx		(x)	(x)		xxx

xxx: very high efficacy. xx: high efficacy. x: good efficacy. Under all conditions.
 (x): observed efficacy in lab and semi field trials, not yet observed in field trials.

Bold: most frequent / dangerous species.



FresaProtect: Geographical situation of the trials I



- ~40 Greenhouses
- > 20000 m²

FresaProtect: Geographical situation of the trials II

- Trials around Europe



- Total Area in EU ~ 120000m²

FresaProtect: strawberries varieties

- Darselect
- El Santa
- Lambada
- Candiss
- Charlotte
- Darselect Bright
- Manille
- Marotte
- Cirafine
- Ciflorette
- Gariguette
- Cléry
- Festival
- Candonga
- Fortuna
- Primori
- Felicia

FresaProtect: Cultures types

- Tunnels:
 - With or without floating row cover
- Soiless



FresaProtect: Strategies used

- Precocity
- Nutrition
- Doses / rates
- Releasing points
- Following
- Confidence

FresaProtect: Releasing points

- Different prototypes tried out
 - Ventilated plastic tubes
 - Cardboard box on feet
 - Cardboard tube on stake
 - Integrated honey point
 - Commercial prototype
 - Commercial tubes



FresaProtect: Results I

- Parasitoids life length
- Spread out emergence
- Aphids localized in more than 75% of the greenhouses
- Control in every case
- High interest of the growers

FresaProtect: Results II



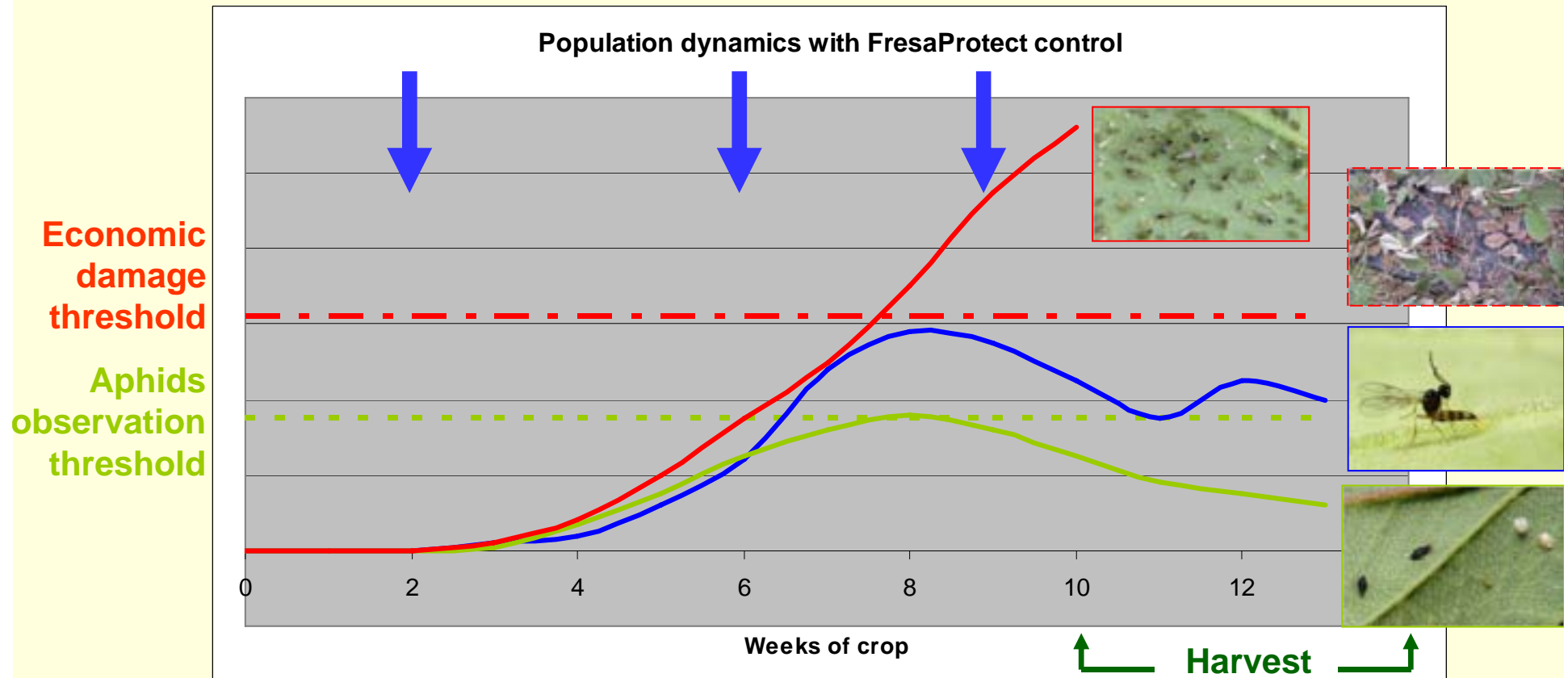


FresaProtect: Results III

- Parasitoids populations installation
- Mummies, but few aphids spotted
- Traces of cleaned hot spots
- *M. euphorbiae* and *A. malvae rogersii* => reservoir of population
- Natural installation of other beneficials
- Parasitoids installation in adjacent greenhouses

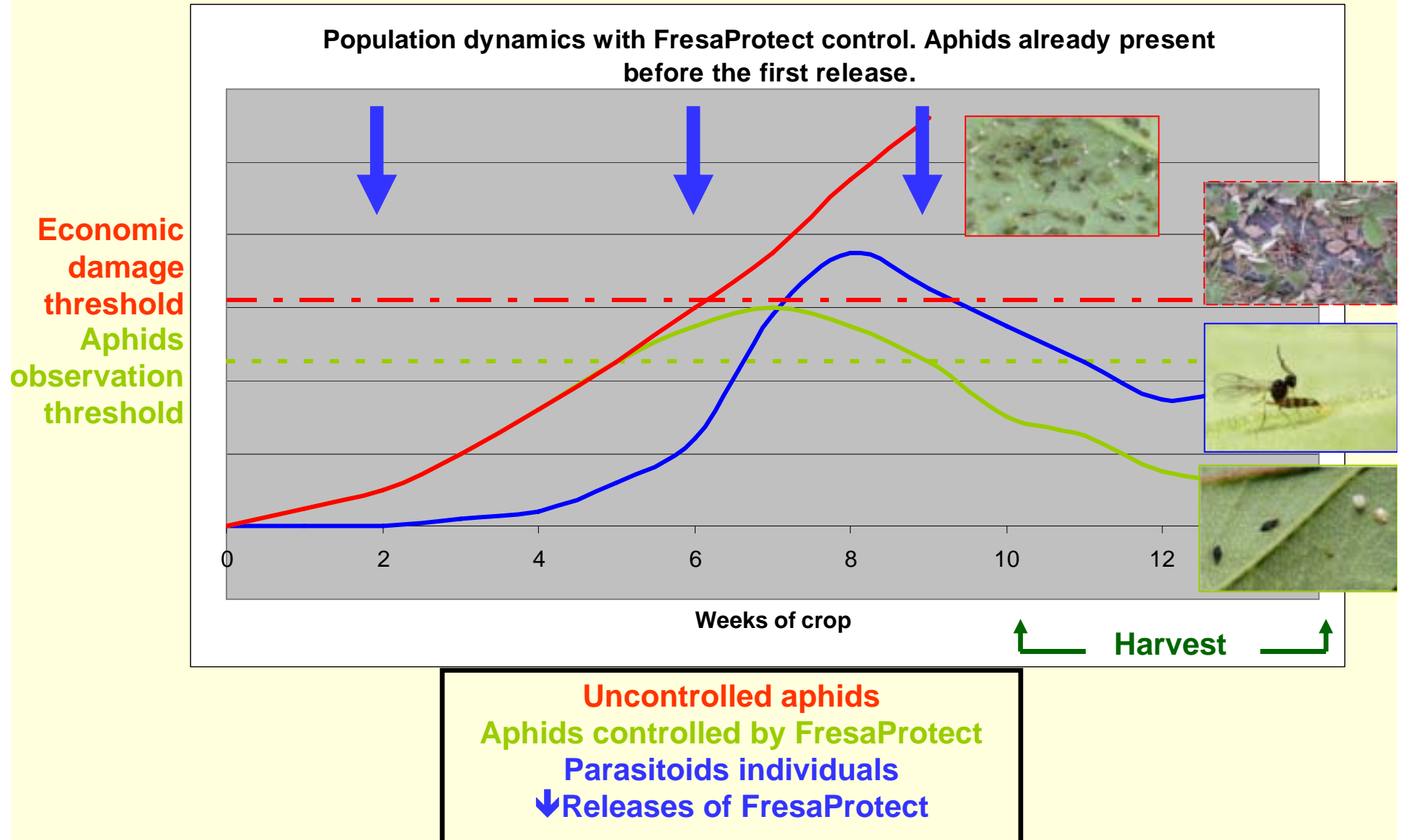


FresaProtect: Additional observations

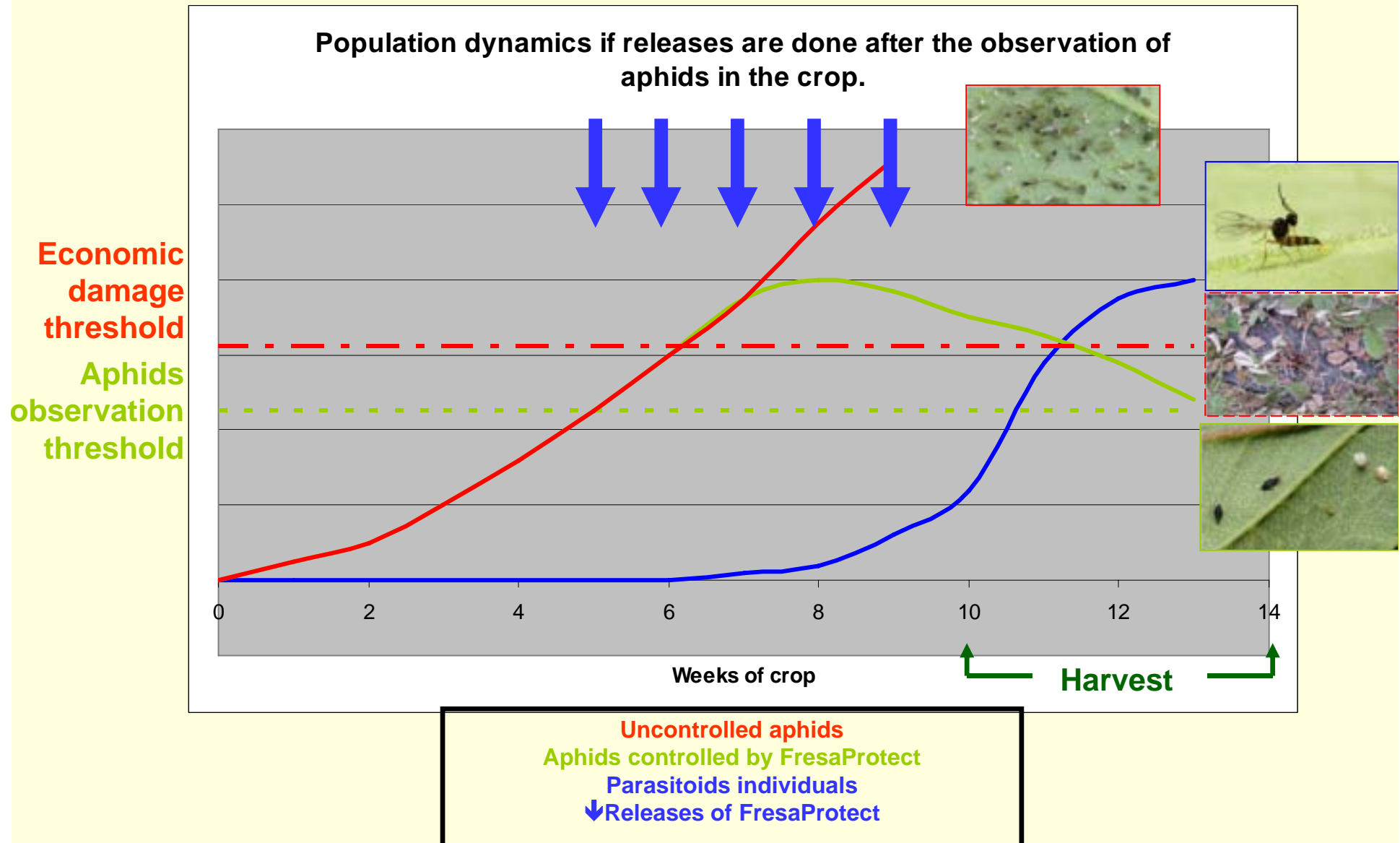


Uncontrolled aphids
Aphids controlled by FresaProtect
Parasitoids individuals
↓ Releases of FresaProtect

FresaProtect: Additional observations



FresaProtect: Additional observations



FresaProtect: Conclusions

- Advantages < > chemical response
 - Equal easiness
 - Efficiency
 - No resistance
 - Filling the gap in an IPM strategy
 - PRECAUTIONS
 - Preventive use
 - Adequate use
 - No immediate effect
- = > Cocktails developed for other crops
(XXXProtect Line: Berries, Ornamentals...)



FresaProtect:

The use of a cocktail of parasitoids against aphids in strawberries – a case study

Thank you for your attention

More info: www.viridaxis.com

Nicolas de Menten: ndementen@viridaxis.com