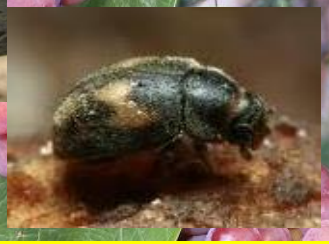
Gaiole in Chianti, 24 febbraio 2015



Prime esperienze nel controllo biologico di *Planococcus ficus in Toscana*

Andrea Lucchi

DiSAAA - Università di Pisa

Pseudococcus maritimus

Pseudococcus viburni

Pseudococcus longispinus

Planococcus ficus

Ferrisia gilli

Common mealybug species in vineyards are (A) grape mealybug, with orange-to-red ostiolar secretion near the head and anus (the fluid is often a defensive tactic to ward off predators); (B) obscure mealybug; (C) longtailed mealybug; (D) vine mealybug approaching a grape berry; and (E) Gill's mealybug with glasslike rods brushed aside to show adult wax pattern.

Daane, K. M., Malakar-Kuenen, R., and Walton, V. M. 2004. Temperature development of *Anagyrus pseudococci* (Hymenoptera: Encyrtidae) as a parasitoid of the vine mealybug,*Planococcus ficus* (Homoptera: Pseudococcidae). *Biological Control* **31**, 123-132.

PSEUDOCOCCIDI VITE IN ITALIA

Planococcus ficus (Signoret)

Pseudococcus longispinus Targioni-Tozzetti

Planococcus citri (Risso)

Heliococcus bohemicus Sulč

La cocciniglia farinosa trasmette due virus della vite

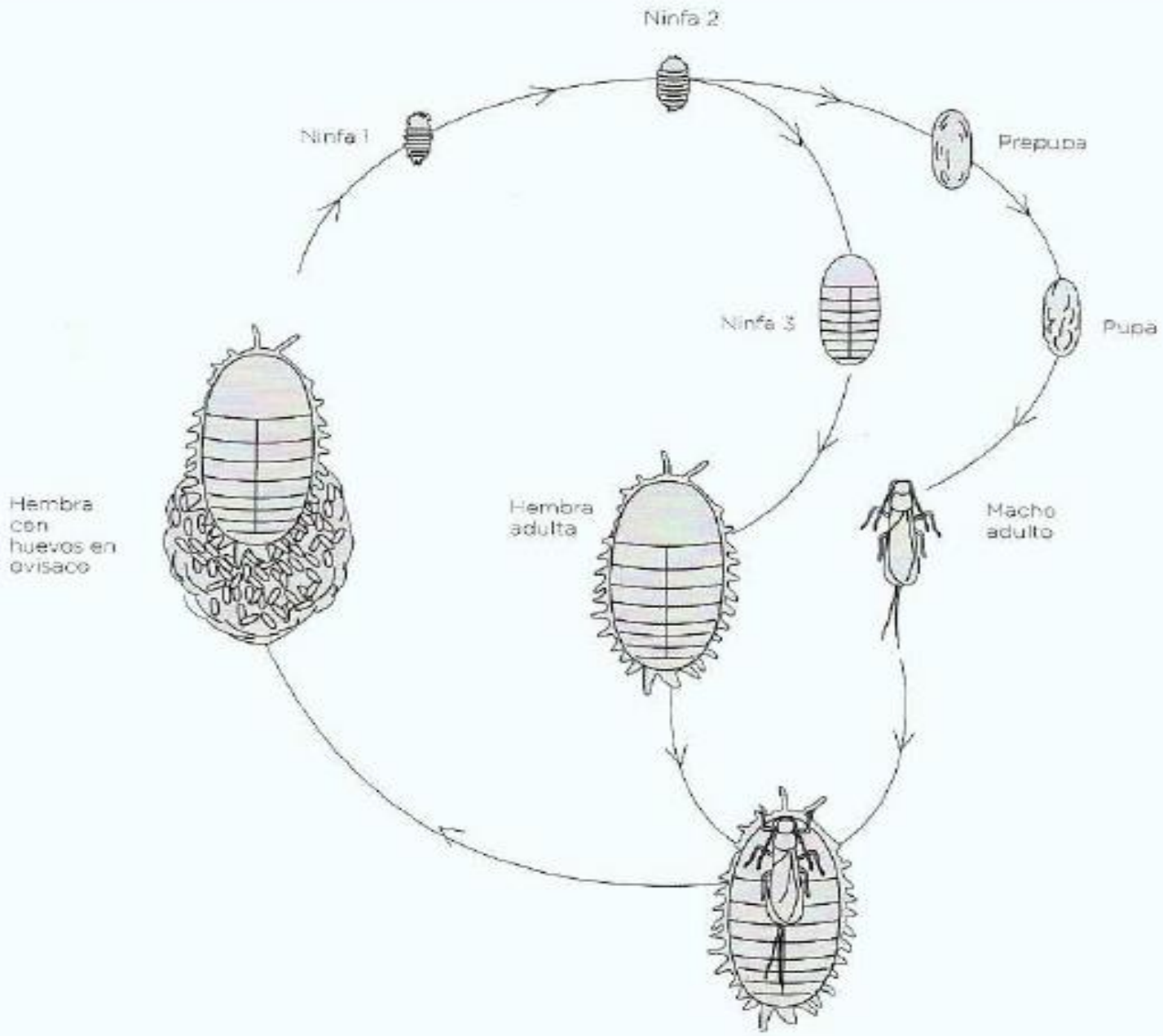
di ***R. Credi, F. Terlizzi*** **C. Lanzoni, L. Martini, S. Borsari, E. Pasqualini**

La ricerca ha confermato la capacità di *Planococcus ficus* di veicolare il virus dell'accartocciamento fogliare (GLRaV-3) e del legno riccio (GVA)

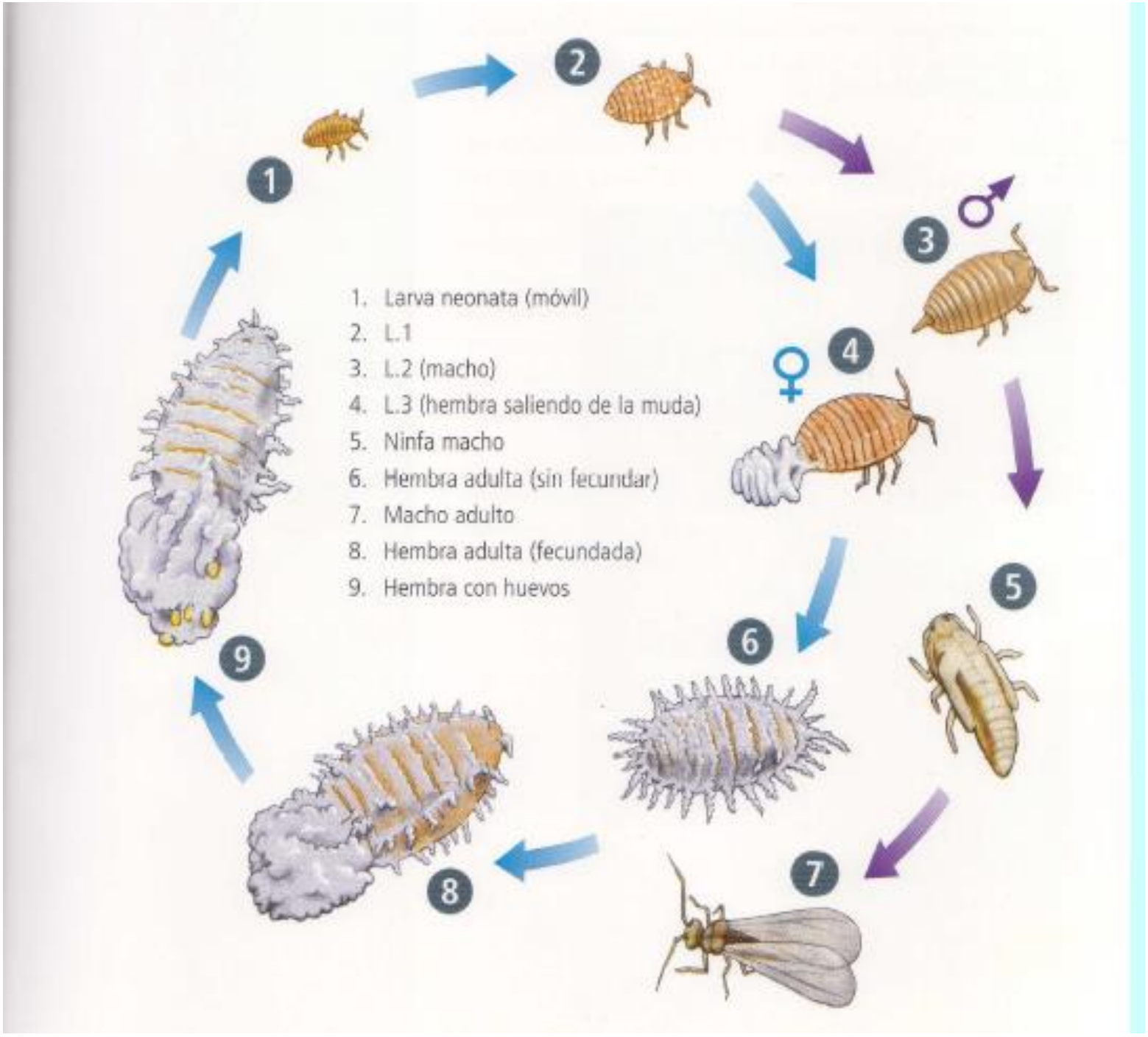
L'Informatore Agrario, 33/2010

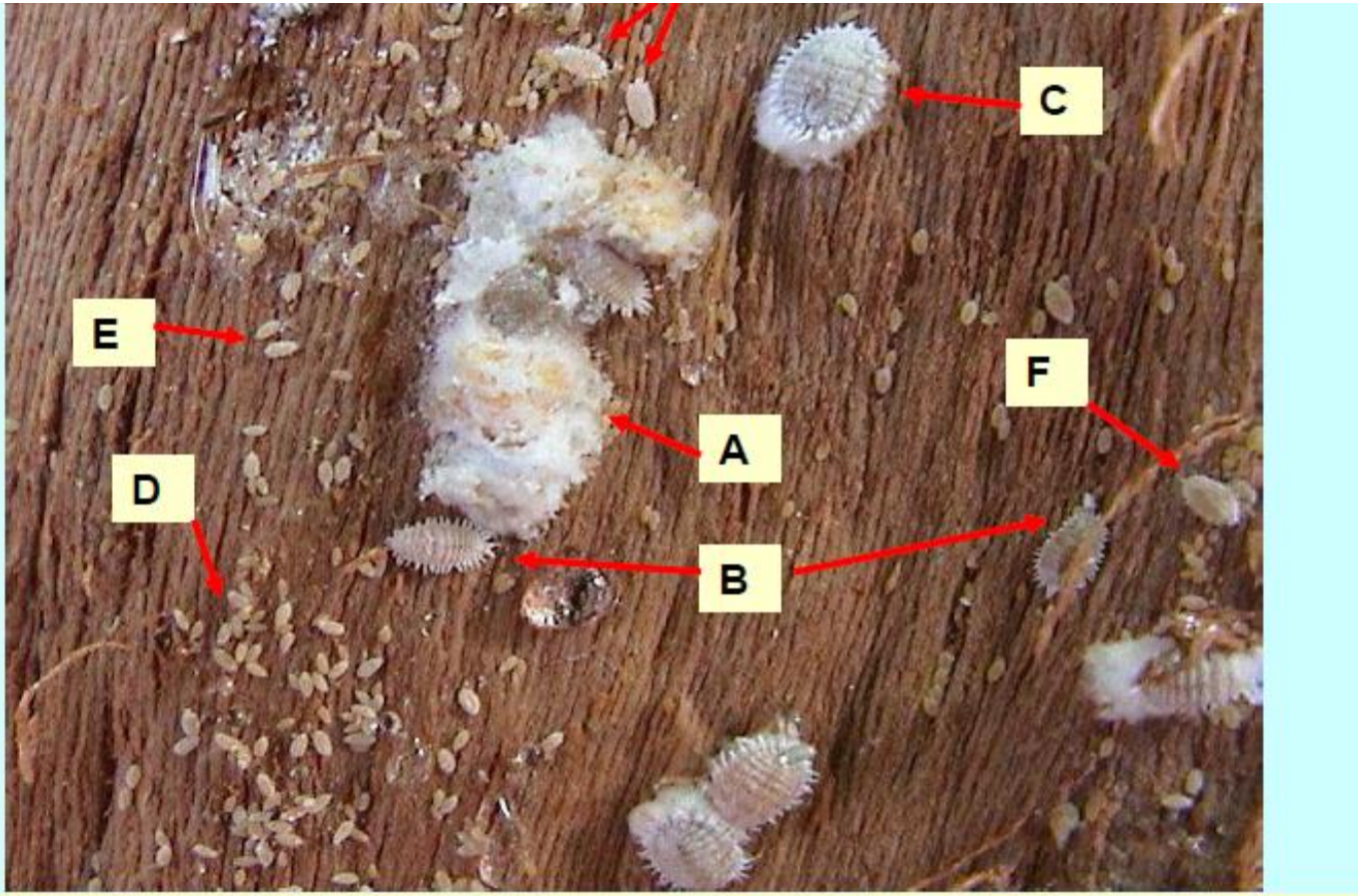
Foto 1 Anomalo arrossamento della vegetazione in vite di una cultivar a bacca nera (Sangiovese), sintomatologia tipicamente indotta dagli agenti (in questo caso l'ampelovirus GLRaV-3) del complesso dell'accartocciamento fogliare

Foto 2 Manifestazioni patologiche che caratterizzano il legno riccio: scanalature-infossature nel tronco del portinnesto (Kober 5BB) di una vite infetta dal vitivirus GVA, uno degli agenti di questa malattia



Ciclo biológico genérico de los Pseudocóccidos


1. Larva neonata (móvil)
2. L.1
3. L.2 (macho)
4. L.3 (hembra saliendo de la muda)
5. Ninfa macho
6. Hembra adulta (sin fecundar)
7. Macho adulto
8. Hembra adulta (fecundada)
9. Hembra con huevos



Colonia con hembras adultas con ovisaco (A) y sin ovisaco (B), fecundada (C), ninfas de primer (D) estadio y alguna de 2º (E) y 3º (F)

Trappole a feromone per la cattura dei maschi di *P. ficus*

Lavandulyl senecioate

Pergamon

Tetrahedron Letters 42 (2001) 1619–1621

TETRAHEDRON LETTERS

Identification and synthesis of the sex pheromone of the vine mealybug, *Planococcus ficus*

Diane M. Hinkens, J. Steven McElfresh and Jocelyn G. Millar*

Departments of Entomology and Chemistry, University of California, Riverside, CA 92521, USA

Received 2 November 2000; revised 11 December 2000; accepted 12 December 2000

Abstract—Sexually mature females of an important agricultural pest, the vine mealybug *Planococcus ficus*, produce the monoterpene (*S*)-lavandulol and the corresponding ester, (*S*)-(+)-lavandulyl senecioate. The racemic ester was highly attractive to mature male mealybugs, whereas lavandulol was not. The naturally produced 2:5 blend of lavandulol and the ester also was no more attractive than the ester alone.

Vine Mealybug Male

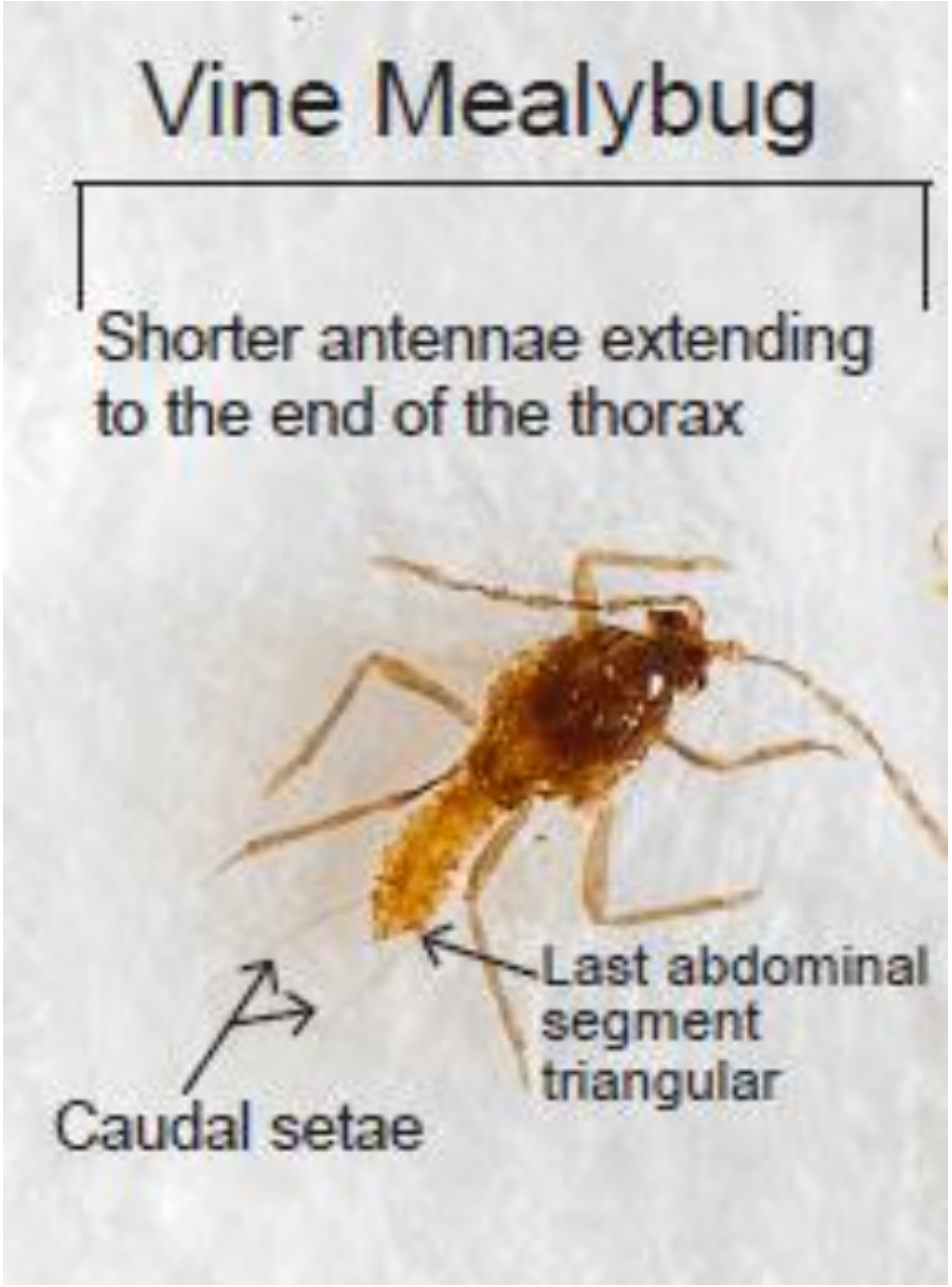
Smaller in size (approx. 0.7 mm)

Antennae as long as head and thorax

Shorter legs

A pair of caudal setae

Last abdominal segment triangular in shape



David John Langone, Tesi di Dottorato 2013
California State University Fresno

EFFICACY OF PHEROMONE MATING DISRUPTION FOR VINE MEALYBUG CONTROL

The vine mealybug (VMB), *Planococcus ficus* (Signoret), is an establ vineyard pest in California along with almost all other wine grape growing regions. The influence of the pheromone, [S] lavandulyl senecioate, is expe form a cost effective mating disruption system across commercial scale vine plantings. Proprietary pheromone puffer systems, standard pheromone dispe cards and delta traps were all used to gather data on infestation level and VMB movement. The experiments show that whenever pheromone is present in the vineyard with any level of VMB infestation there will be a mating disruption effect. Pheromone puffer systems produced significant improvements over insecticide treatments alone with up to 50% reduction in total damage to the harvested crop. Standard pheromone dispenser cards supported highly effective mating disruption with only 2% of the total crop affected in any way when cards

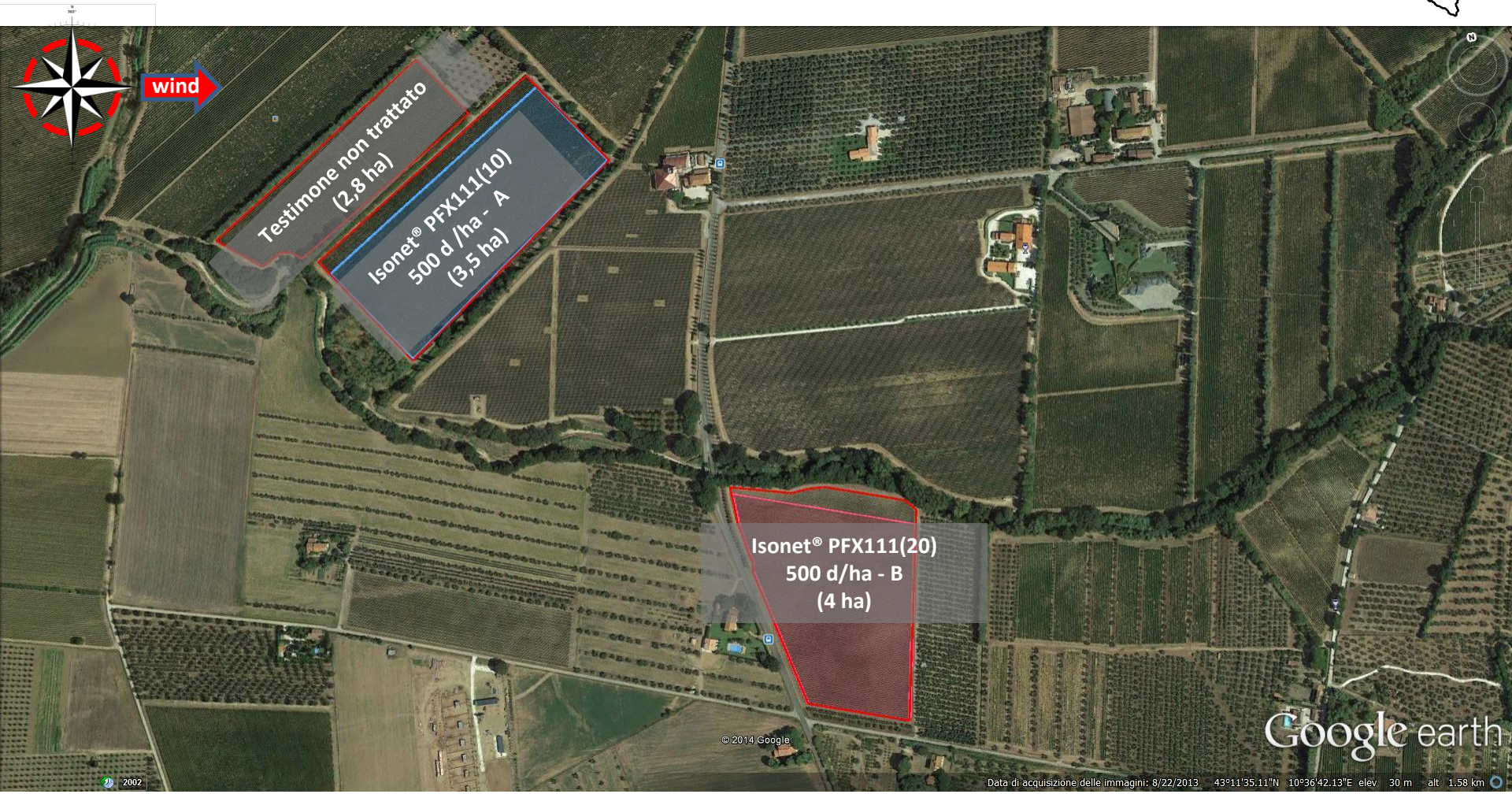
Prove *Planococcus ficus* 2014

Coltura	Codice prova	Località			Cv	Dosaggio (dispenser/ha)		
		Regione	Provincia	Area		PFX111(10) A	PFX111(10) A	PFX111(20) B
Vite da vino	VMB-TUS-1-14	Toscana	Livorno	Cecina	Merlot	500d/ha	-	500d/ha
	VMB-TUS-2-14	Toscana	Livorno	Cecina	Merlot	500d/ha	1000d/ha	500d/ha

Nelle immagini in altro i due tipi di dispensers saggiati, nella tabella i dettagli relativi a cv e dosaggi.

Disposizione appezzamenti

Livorno 1 (Toscana)
VMB-TUS-1-14



Livorno 1 e 2
(Toscana)
VMB-TUS-2-14

Rilievi sul ceppo (30 Maggio 2014)

Ciascun appezzamento: 6 parcelle, 7 viti per parcella (42 piante x appezzamento)

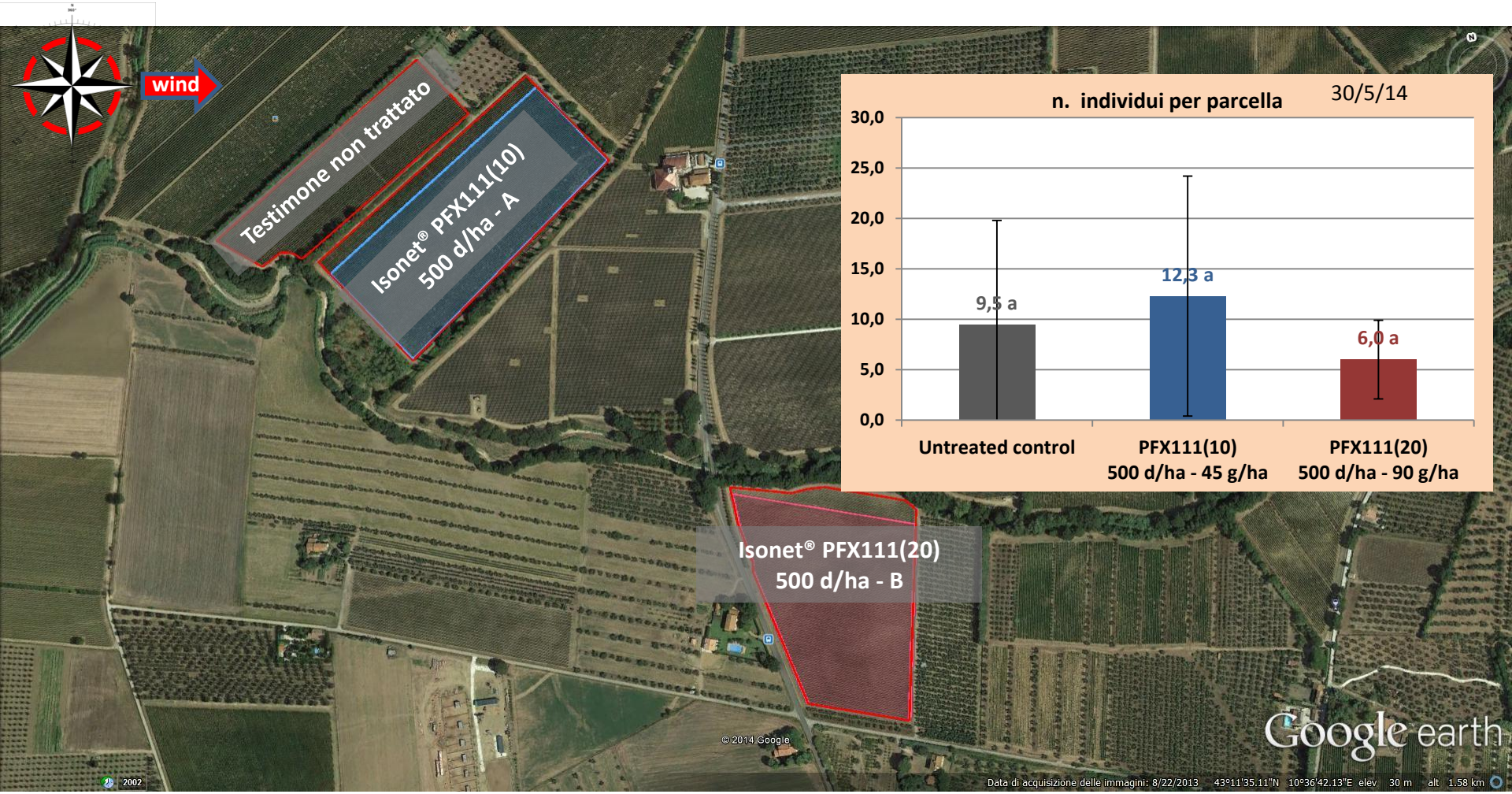
Per una stima iniziale dell'infestazione sul ceppo, sotto il ritidoma, nei diversi appezzamenti studiati

Rilievi sulla vegetazione e sui grappoli (Luglio 2014) e solo sui grappoli (Settembre 2014)

Ciascun appezzamento: 6 parcelle, 100 grappoli per parcella (600 grappoli per appezzamento)

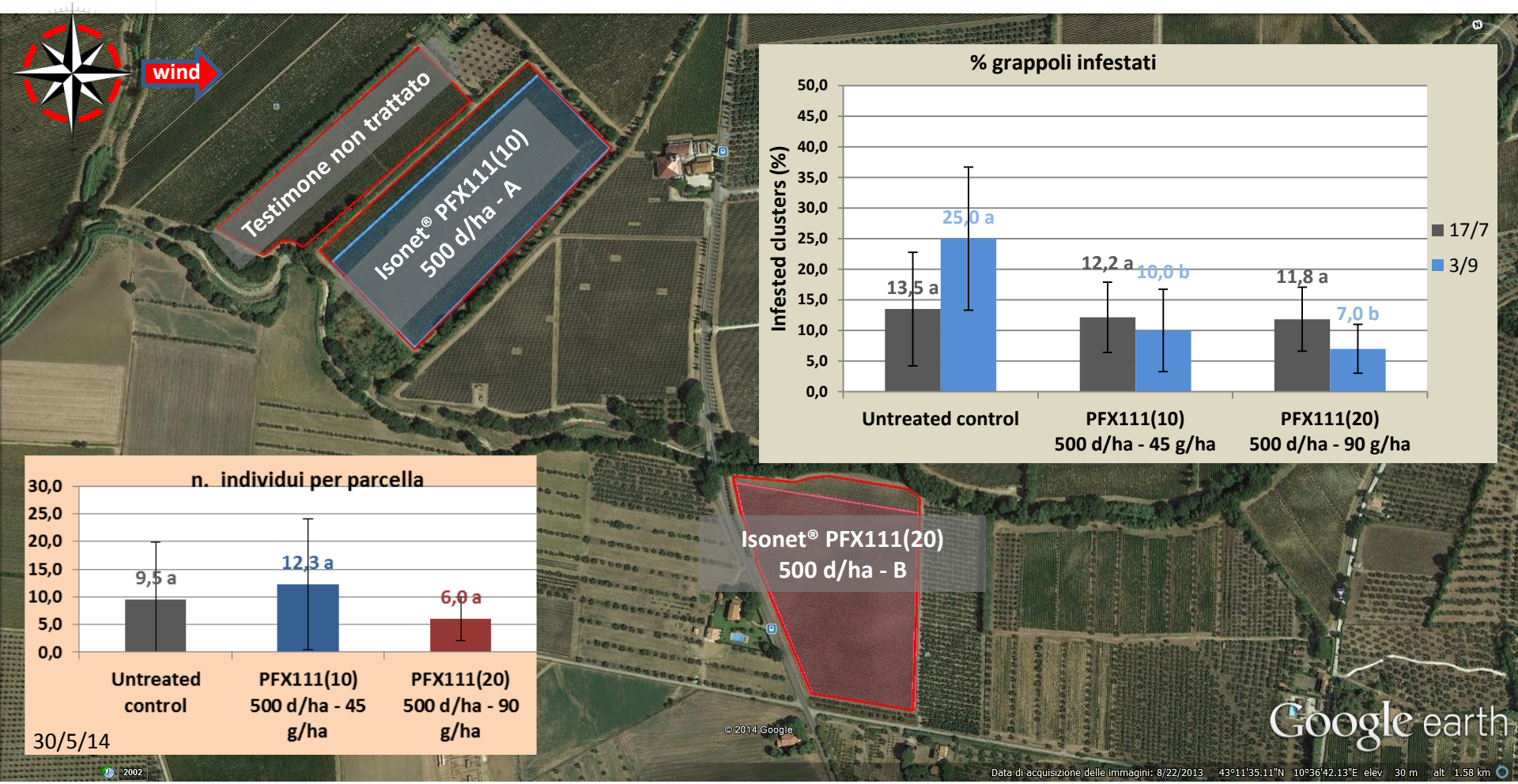
Campionamento ceppi (23/05/2014)

Livorno 1 (Toscana)
VMB-TUS-1-14



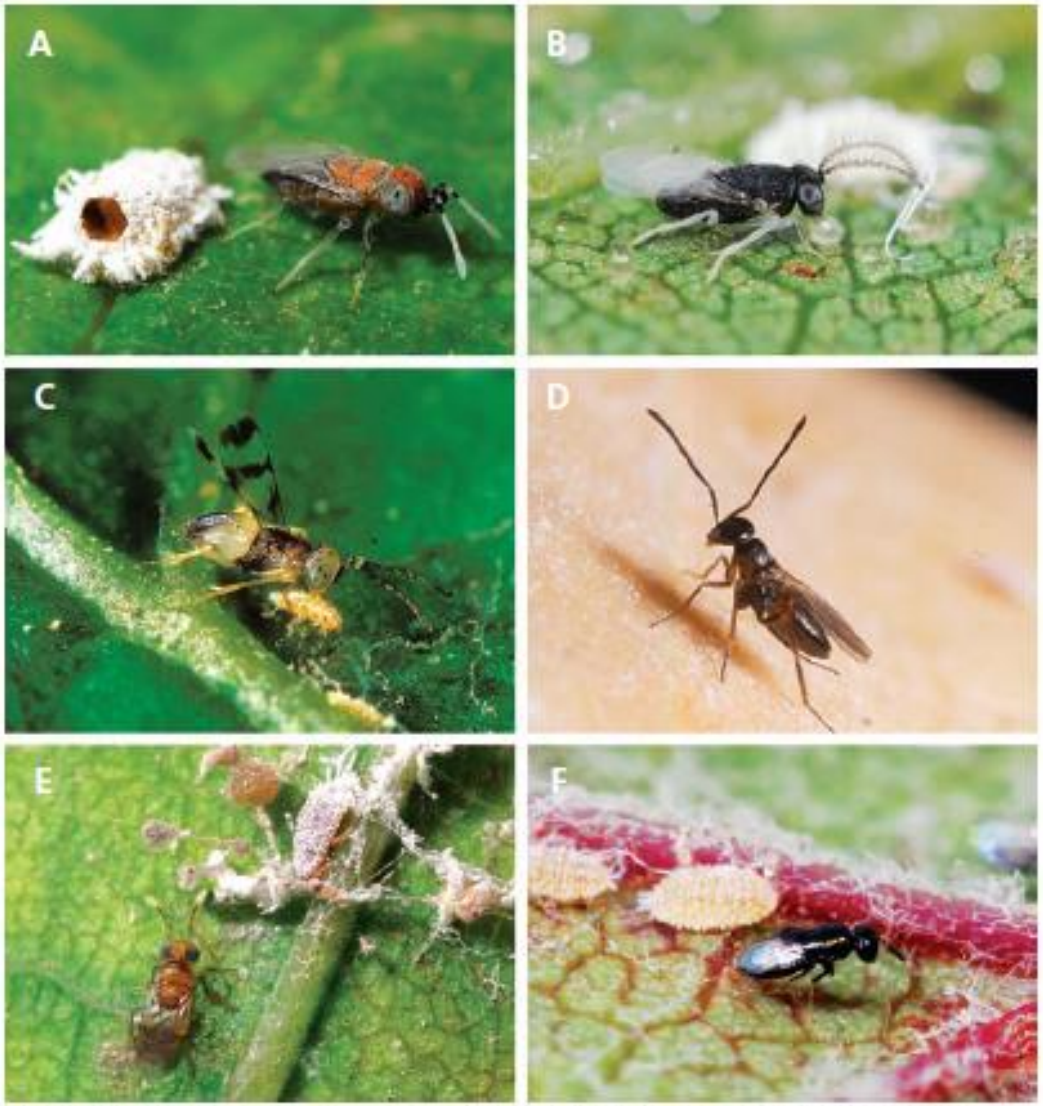
Grappoli infestati (%)
(Luglio e Settembre 2014)

Livorno 1 (Toscana)
VMB-TUS-1-14



Daane et al., 2004

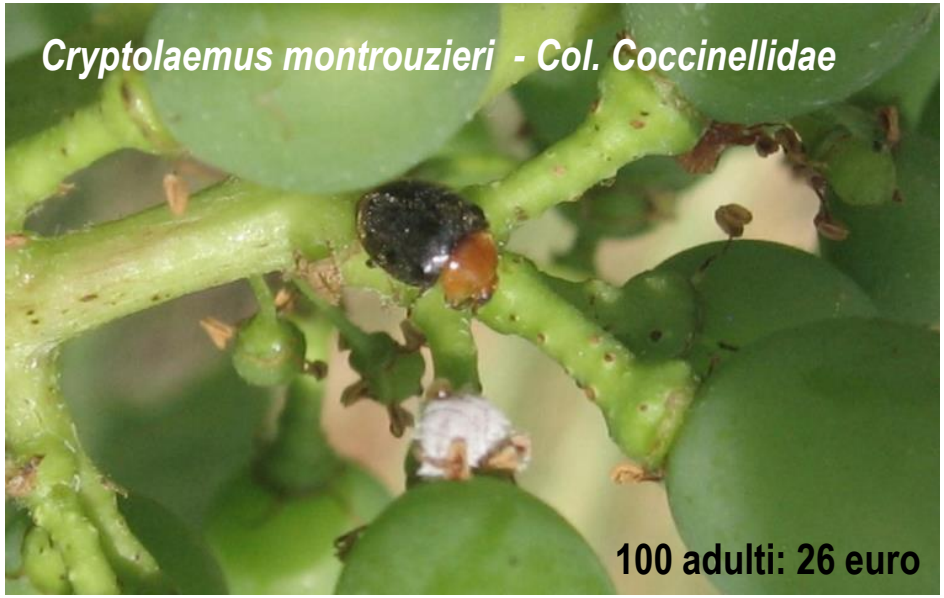
Common mealybug predators include lady beetles. (A) An adult *Scymnus* species feeds on a grape mealybug. (B) A large mealybug destroyer larva near the smaller obscure mealybug; the larvae of many of these lady beetle species have waxy filaments to mimic mealybugs and reduce interference from mealybug-tending ants. (C) A cecidomyiid larva prepares to feed on grape mealybugs. (D) A third-instar green lacewing (*Chrysoperla carnea*) larva attacks a grape mealybug, prompting it to secrete a ball of red ostiolar fluid in defense.



Many parasitoid species attack mealybugs, including: (A) a female *Anagyrus pseudococci* (ca. 2 mm) near a vine mealybug mummy showing the round parasitoid exit hole; (B) the smaller (ca. 1.3 mm) male *A. pseudococci*, which has a different color pattern and hairy antennae, feeds on a drop of honeydew; (C) a female *Leptomastidea abnormis* host-feeds on a vine mealybug crawler; (D) *Leptomastix epona* was imported for obscure mealybug biological control but did not establish because of Argentine ant interference; (E) the small (ca. 1 mm) and fast-moving *Acerophagus flavidulus* closes in on an obscure mealybug; and (F) *Coccidoxenoides perminutus* (ca. 1 mm) near a vine mealybug first instar.

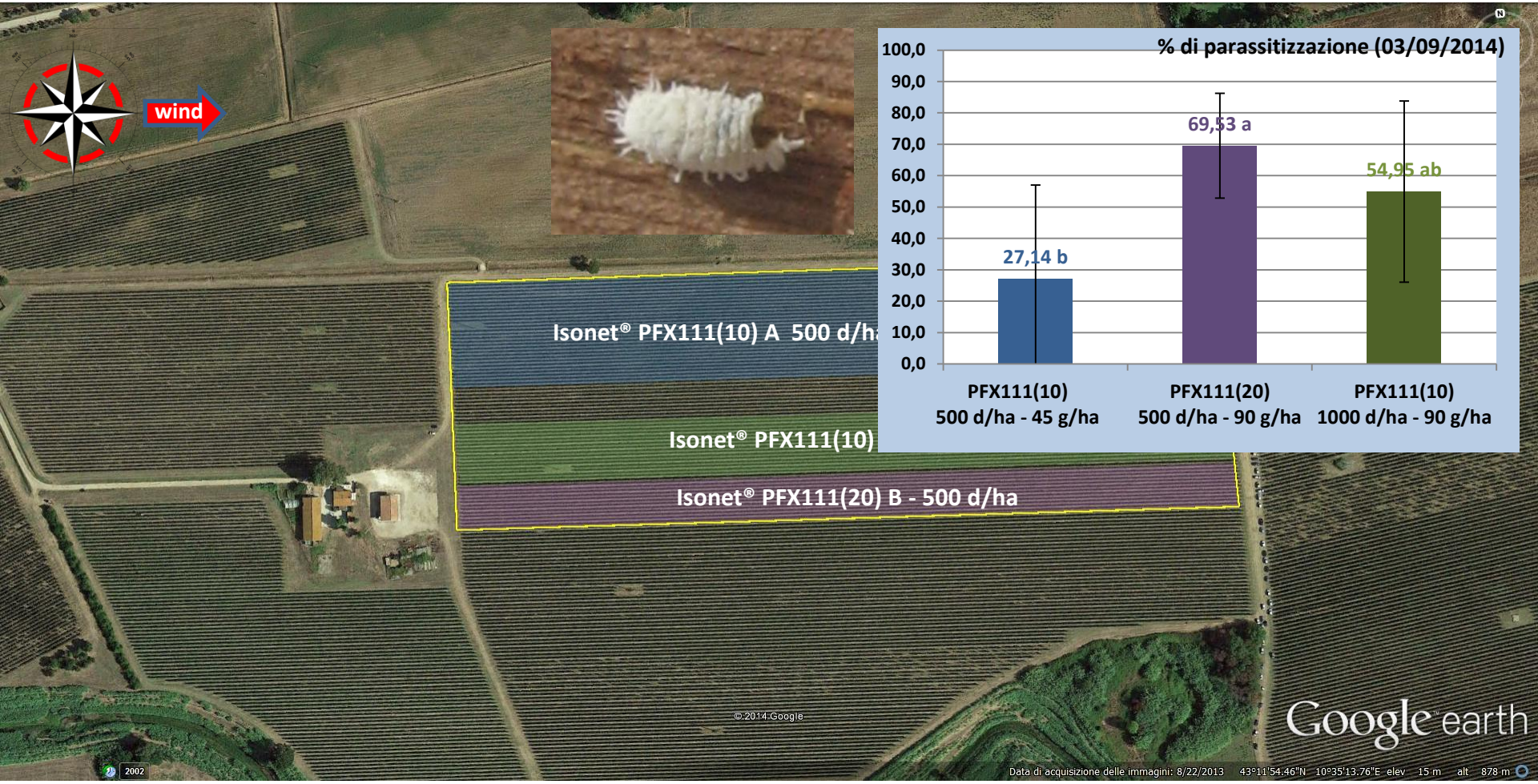
Anagyrus pseudococci – Hym. Encirtidae
250 adulti: 34 euro

Nephus includens - Col. Coccinellidae
250 adulti: 28 euro



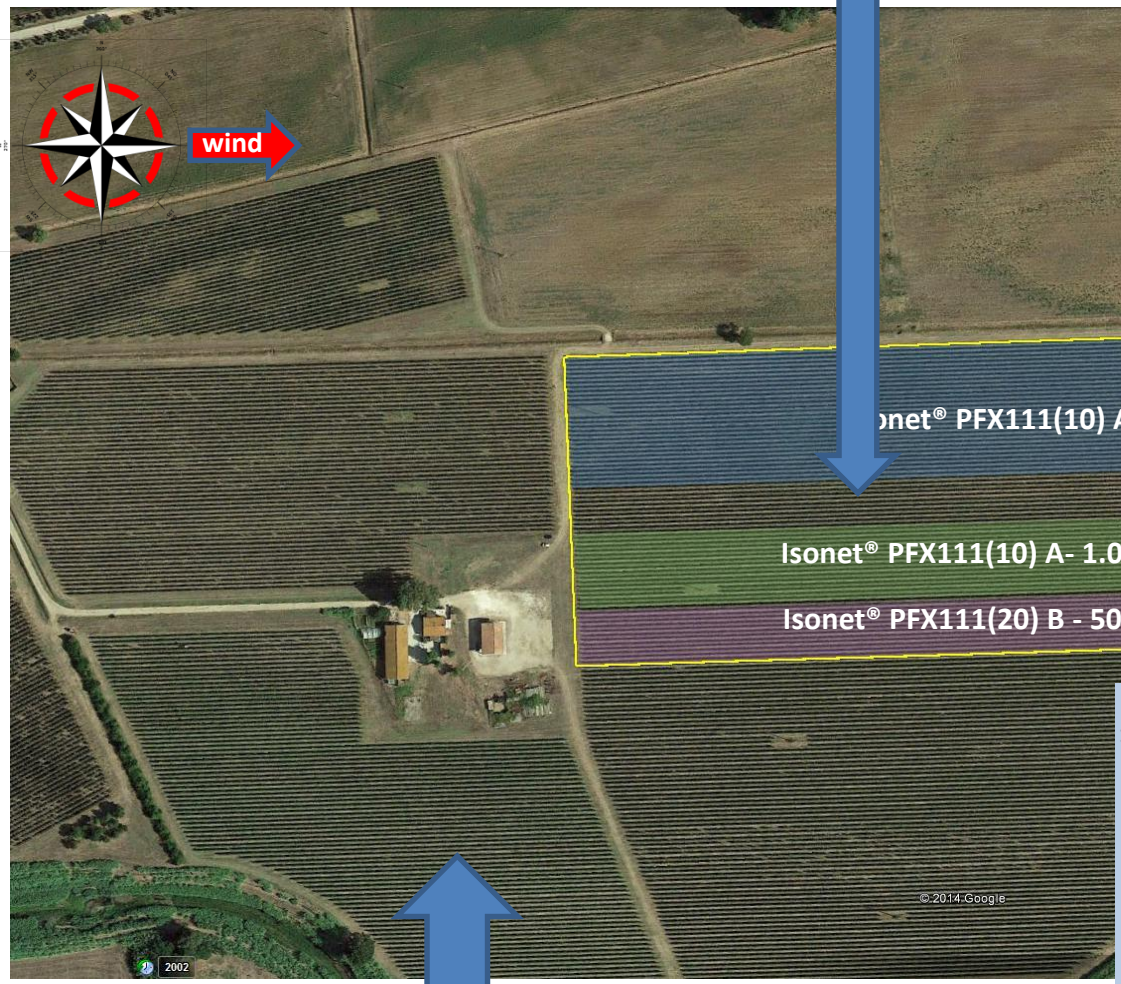
Parassitizzazione (%) (Settembre 2014)

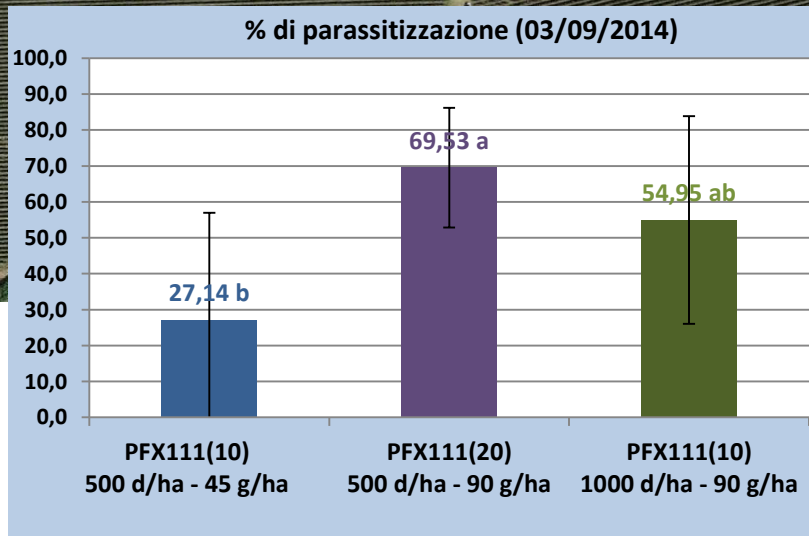
Livorno 2 (Toscana) VMB-TUS-2-14



500 adulti di ***Anagyrus pseudococci*** rilasciati a maggio 2013

Livorno 2 (Toscana)
VMB-TUS-2-14





1000 adulti di ***Anagyrus pseudococci*** rilasciati a maggio 2013 e **3000** a maggio 2014

Considerazioni conclusive sulle attività svolte in Toscana nel 2014

I risultati ottenuti con i rilasci di insetti predatori e parassitoidi attuati a più riprese nel 2013 e 2014 hanno portato a risultati confortanti e addirittura inattesi.
Il tasso di parassitizzazione da parte di *Anagyrus pseudococci* ha raggiunto a **Livorno1** una percentuale variabile dal 18,3 al 26,5% e a **Livorno2** addirittura in un vigneto il **69,53%** e mantenendosi negli altri due tra il 27,14 e il 54,95%.

La confusione sessuale, applicata contro il planococco su 8 ha complessivi di vigneto, ha fornito risultati incoraggianti. Nel caso, considerando che l'effetto della confusione sulla popolazione svernante è praticamente nullo (se è vero che questa è costituita in prevalenza da femmine fecondate), il metodo dovrà essere validato ripetendo la sperimentazione sugli stessi vigneti e, possibilmente, estendendola ad appezzamenti contigui.

Vi ringrazio per l’attenzione

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  - Orius laevigatus
  - Aphidius colemani
  - Cryptolaemus montrouzieri
  - Anagyrus pseudococci
  - Diglyphus isaea
  - Eretmocerus mundus
  - Neoseiulus cucumeris
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Anagyrus pseudococci

Life history and biology

The parasitoid **Anagyrus pseudococci** is a solitary internal parasitoid from the family Encyrtidae. It specializes on the citrus mealybug, the grape mealybug and on the cypress mealybug. Adults show marked sexual dimorphism: the female is about 1.5-2 mm in length and brown, with distinctive black and white banded antennae. The male is smaller (0.8-0.9 mm in length), black in color bearing an arch-like pair of antennae.

A. pseudococci is arrhenotokous, i.e fertilized eggs will produce female offspring whereas non-fertilized eggs will yield males. The preferred hosts for the parasitoid are third instar mealybug nymphs, but the wasps will also readily parasitize second instars as well as young females.

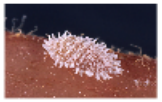
The female parasitoid lays a single egg in each host. Eggs laid in smaller hosts usually produce males. Prior to oviposition, the female parasitoid examines the host with its antennae for several seconds, then turns its caudal end towards the mealybug and inserts its ovipositor between the wax filaments on the lateral margins of the host. Oviposition lasts about 15-40 seconds. The parasitoid's larva completely consumes the contents of the mealybug, going through 5 instars before pupating within the mummified skin of its host. The adult emerges through an irregular exit hole gnawed at the posterior end of the mummy.

The duration of development from egg to adult takes 40.5, 14 and 10.5 days at temperatures 17.5°C, 26°C and 35°C respectively. Males develop slightly faster than females. The lower threshold for development is 13°C. The upper threshold is 38°C. A female of A. pseudococci lays about 15 eggs per day when provided excess number of hosts. It is strongly attracted to light and is rendered inactive at darkness.

APPLICATION

- BioAnagyrusTM is packaged in boxes containing 500 parasitic wasps, at least 50% of them are females.
- Immediately upon emergence, the wasps will mate and then will begin searching for a host suitable for parasitization, ie. third instar larvae or adult mealybugs.
- To apply, remove the lid, expose the adhesive surface of the label (to protect the contents of the package from ants) and place the box in a shady place, protected from rain or dew, preferably close to a mealybug-infested spot. The wasps will fly out of the box and disperse in between the plants.
- Place the box in a way that will prevent ants from getting

The Problem



Planococcus citri

The citrus mealybug, Planococcus citri, is an important pest with a worldwide distribution. It has an enormously wide range of host plants such as citrus, persimmon, banana, vine, and many outdoors, greenhouse and indoors ornamental plants.

› read more

Related Crops

- Pitosphorum
- Aralia
- Vineyard

- Parassitizza preferibilmente forme giovanili di terza età, ma anche II età e giovani femmine.
- Partenogenesi arrenotoca.
- Durata sviluppo (da uovo ad adulto): 40 gg a 17 °C, 10 gg a 35 °C.
- Commercializzato in confezioni di 500 individui, la metà dei quali sono femmine.

Importante eliminare le formiche dai luoghi di rilascio degli Anagyrus.