



GreenWood Service Srl  
la soluzione dalla natura

# La lotta biologica al cinipide del castagno

Dott. ssa Ambra Quacchia

Posta, 29 agosto 2014





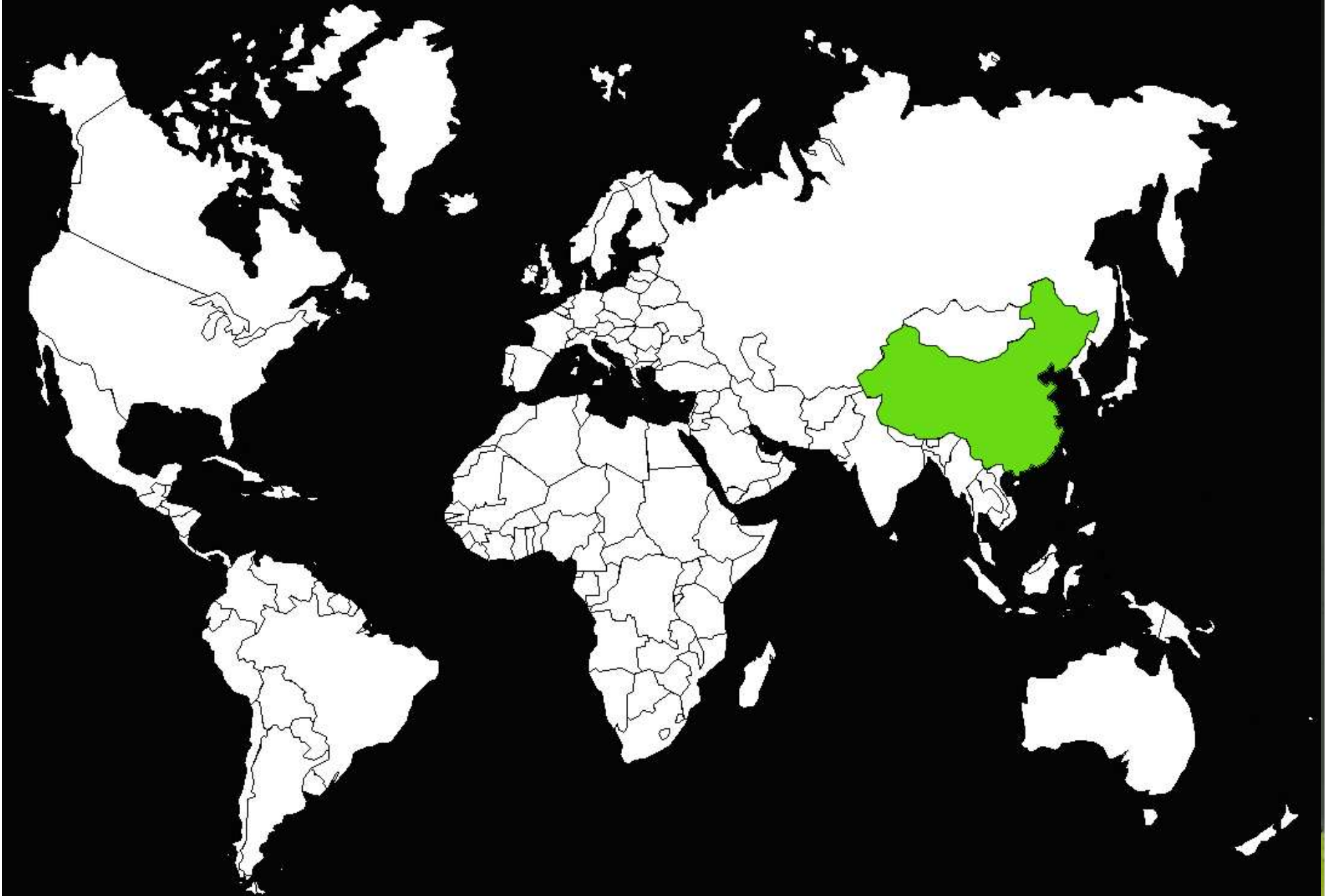
*Cinipidi  
delle querce*

*Cinipide del castagno*

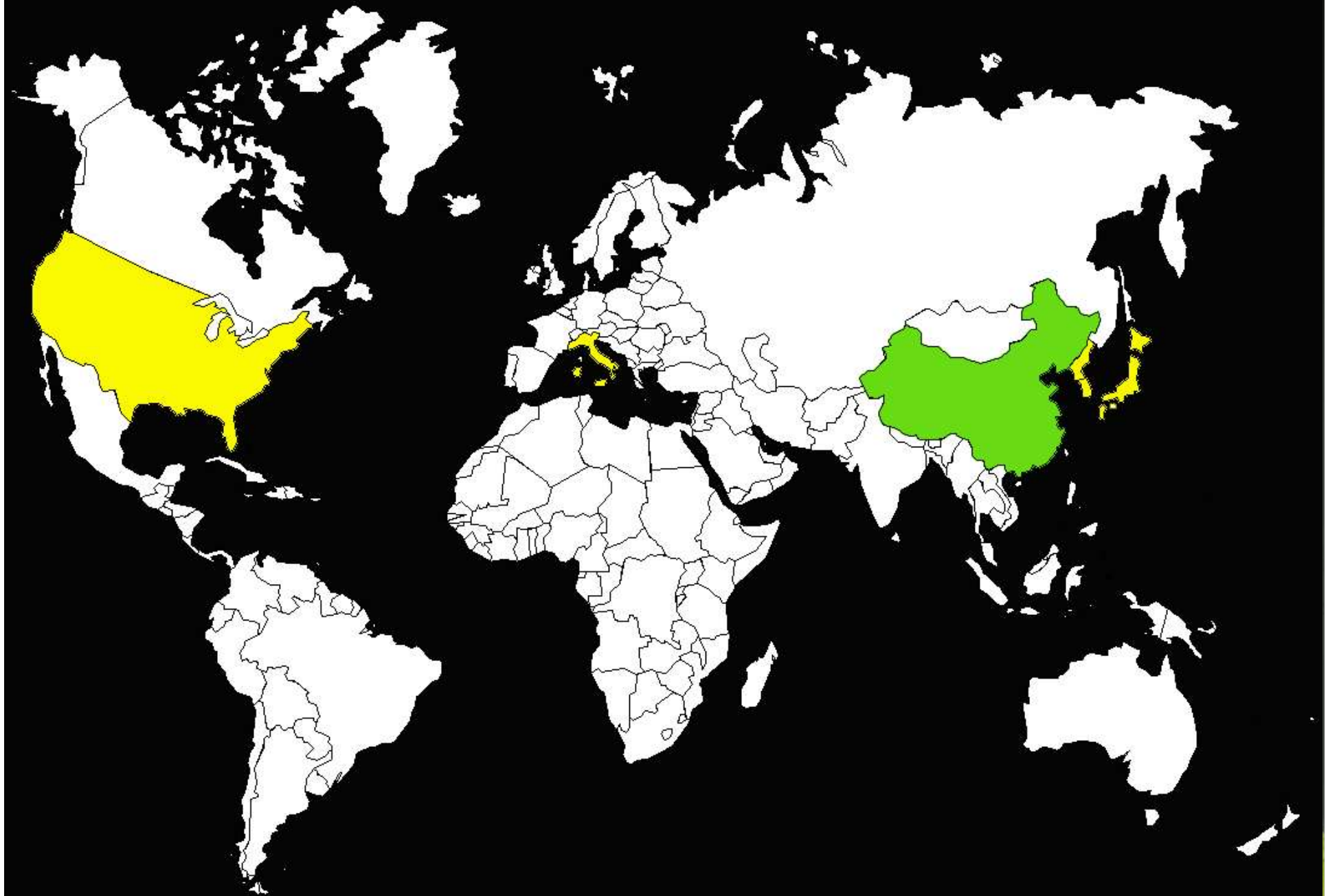




# Origine di *Dryocosmus kuriphilus*



# Diffusione di *Dryocosmus kuriphilus*



# Metodi di controllo del cinipide

*Lotta meccanica* Eventualmente come eradicazione



*Lotta chimica*

Non proponibile  
ambientalmente  
Costosa  
Non risolutiva



*Varietà resistenti*

Bene nei nuovi impianti  
Non tutela varietà locali e boschi  
Possibile superamento delle resistenze

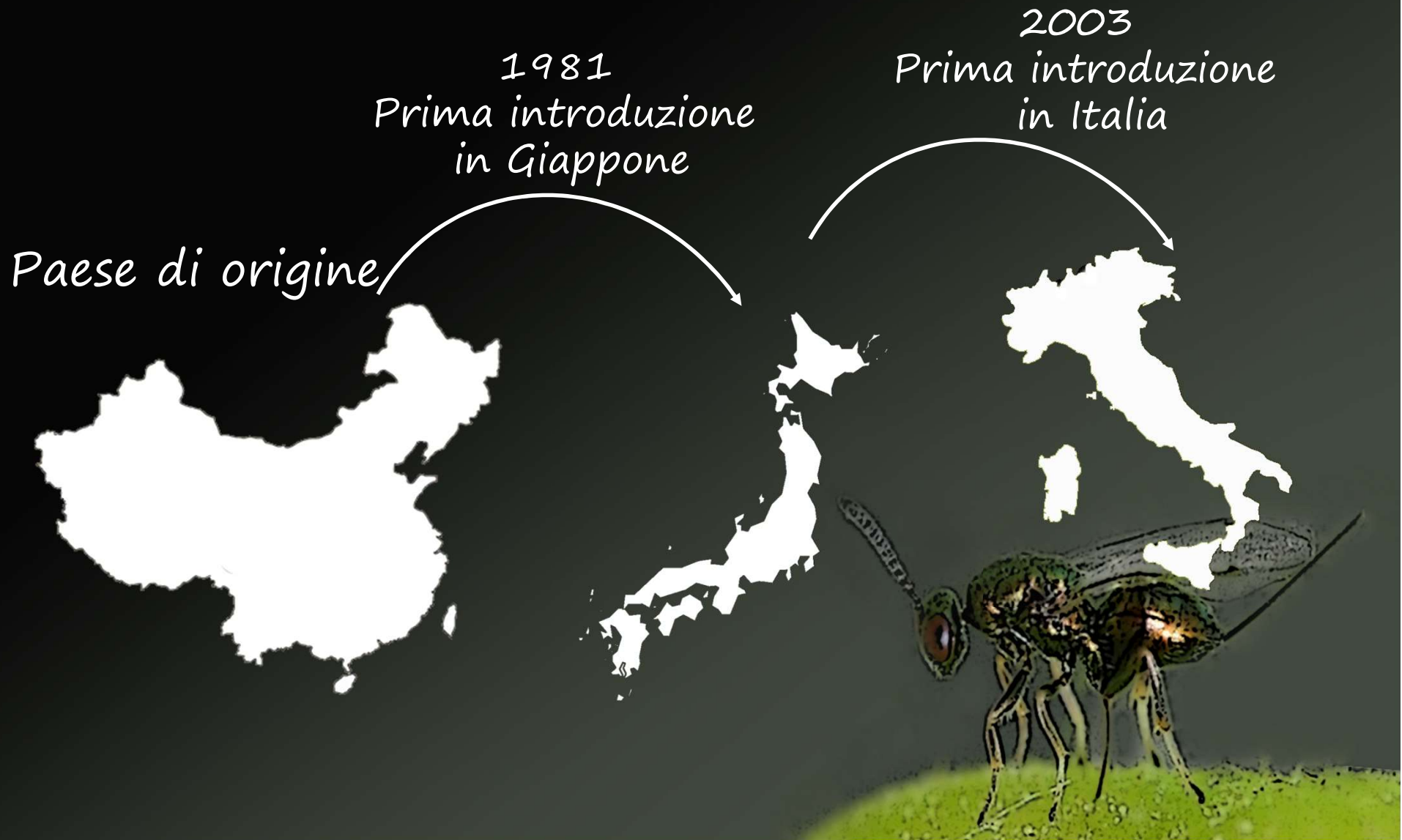


*Lotta biologica*

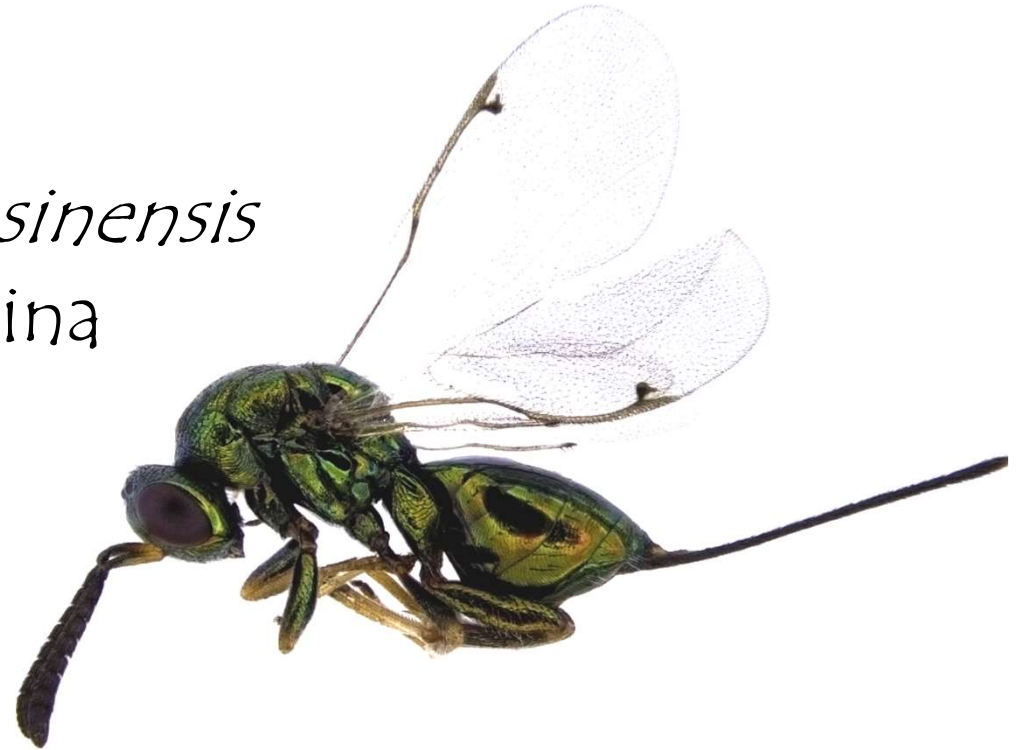
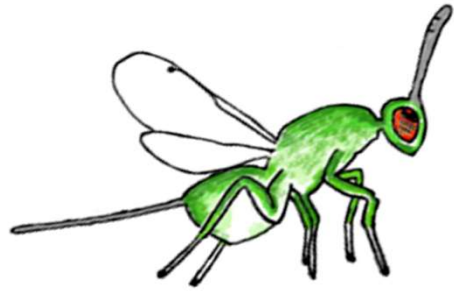
Piccolo investimento iniziale  
Effetti duraturi nel tempo  
Lotta "pulita"



# Introduzione di *Torymus sinensis*



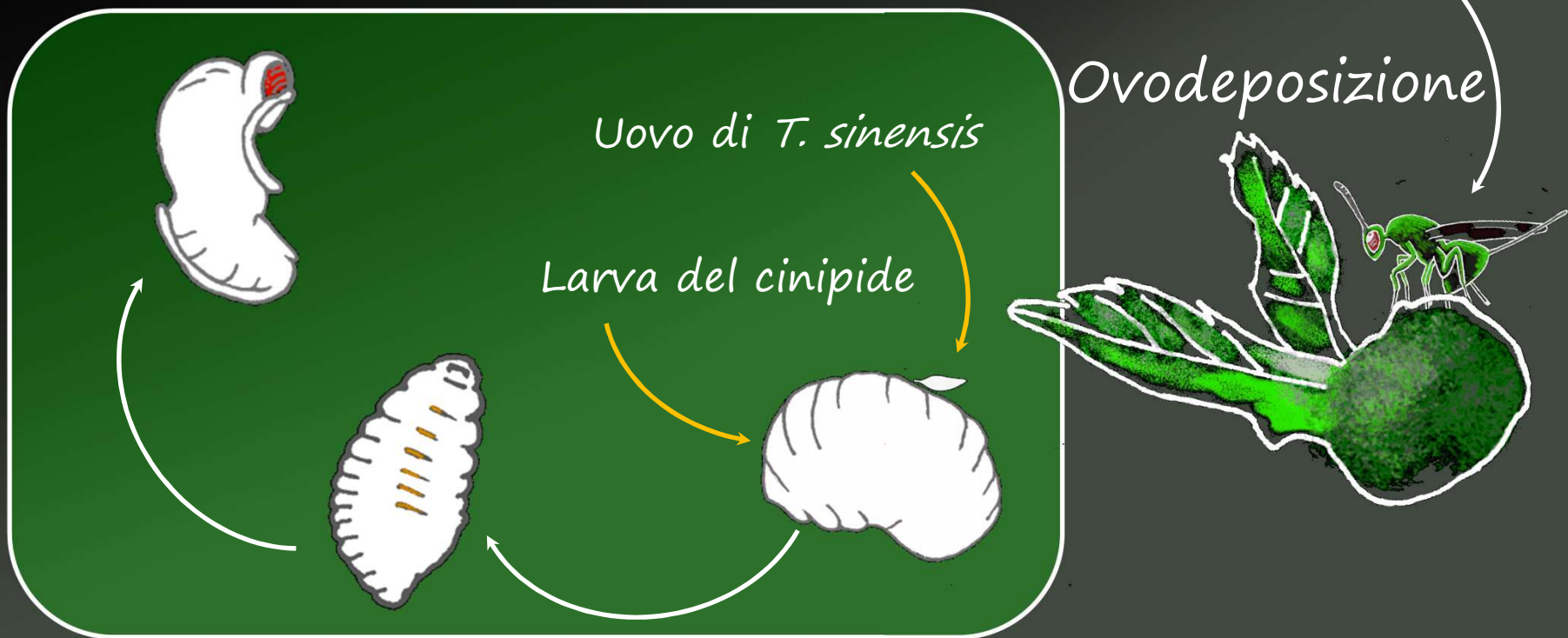
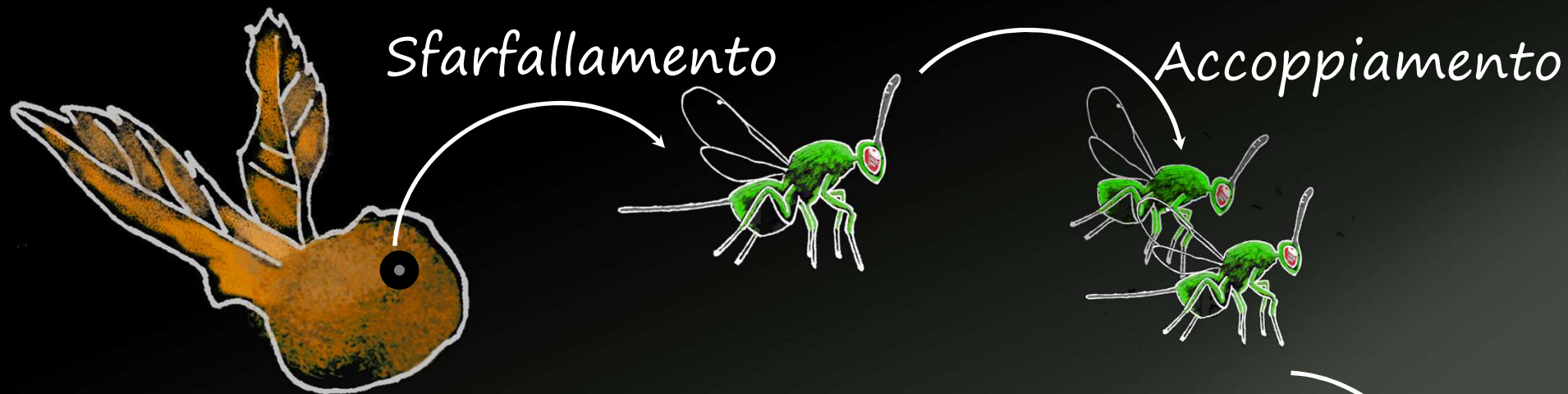
*Torymus sinensis*  
femmina



*Torymus sinensis*  
maschio









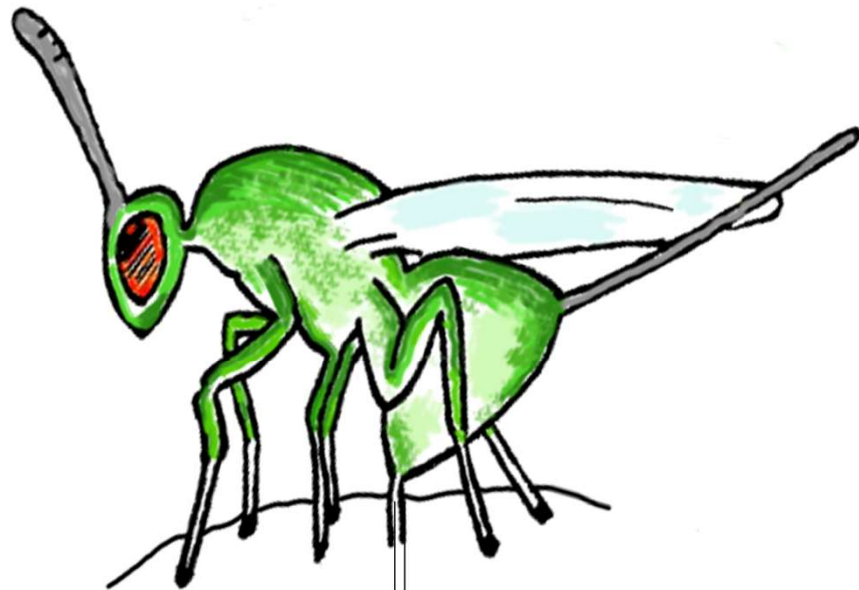
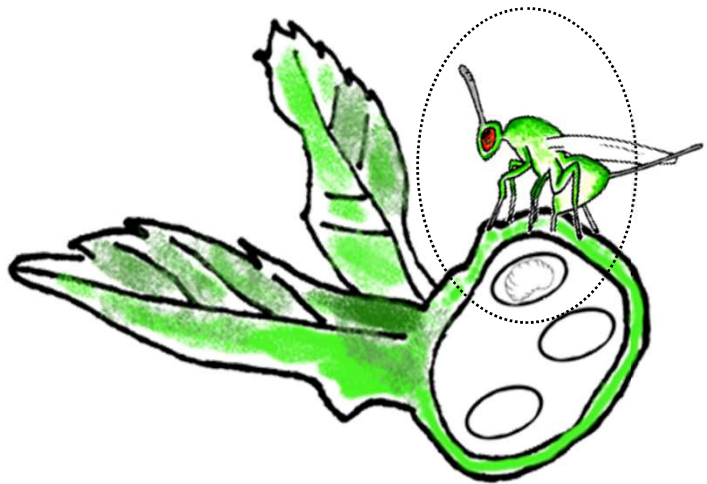
# Ovodeposizione

*Periodo di preovodeposizione*

*70 uova in media per femmina*

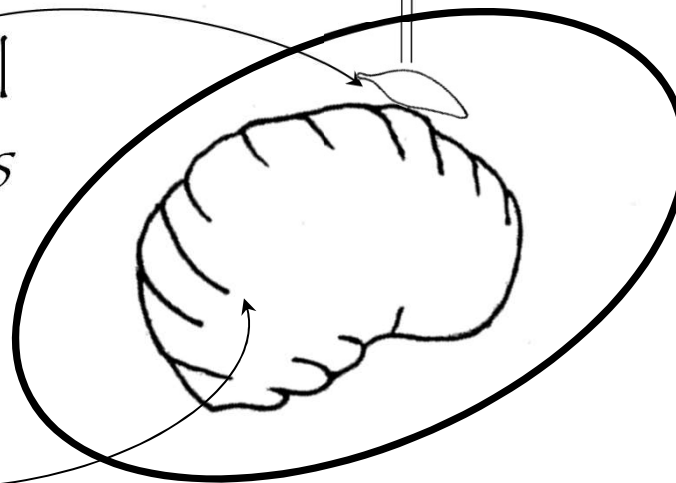
*Host feeding*





Uovo del  
*Torymus*

Larva del  
cinipide





Egg



Larvae



White pupa



Red eyes wp

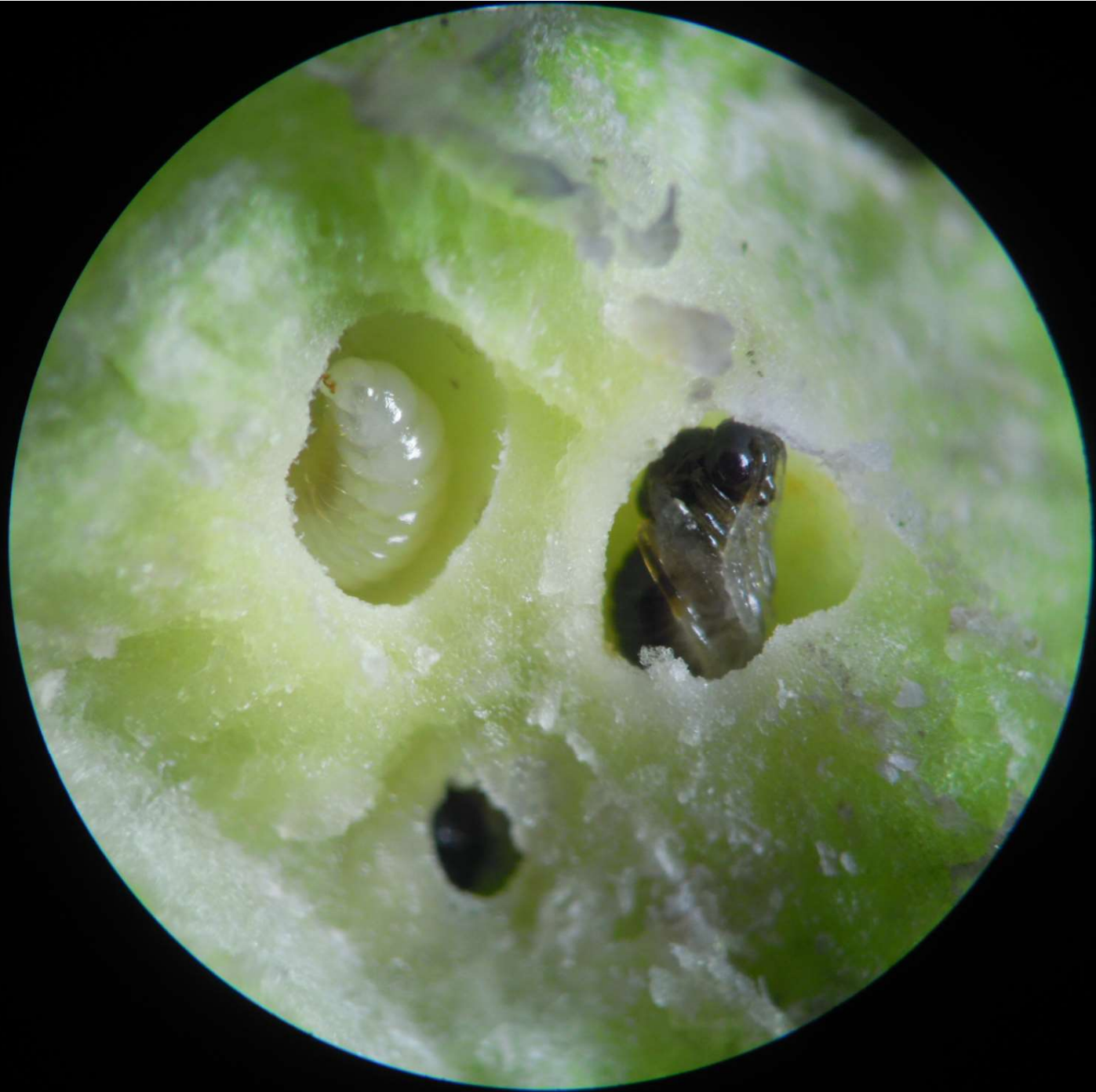


Toning pupa



Black pupa





# Perché *Torymus sinensis* è un buon agente di controllo biologico?

SPECIFICO

- In Giappone, Usa e Italia non è mai stato allevato da altri cinipidi
- Prove di ovodeposizione

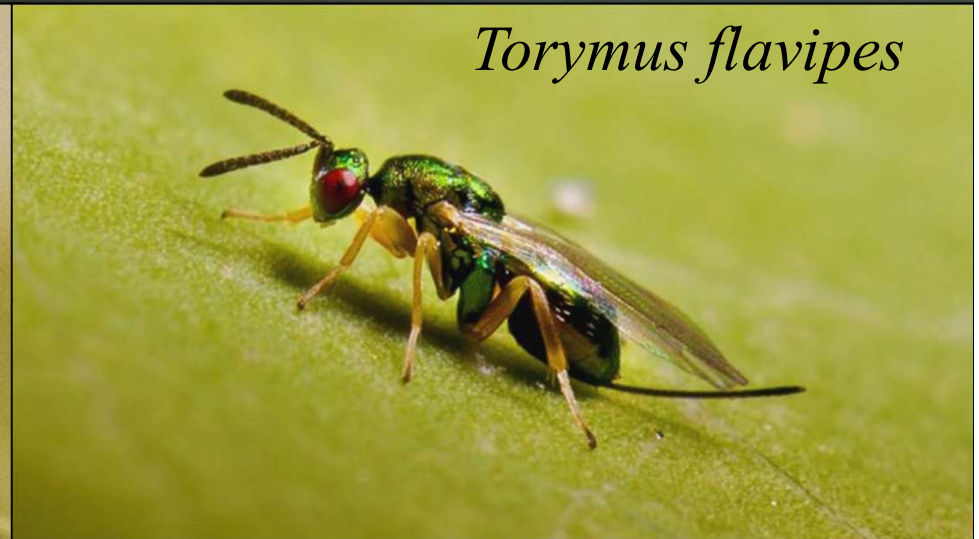


Perché *Torymus sinensis*  
è un buon agente di controllo  
biologico?

SPECIFICO

1 generazione annua

SINCRONIZZATO







*Torymus affinis*



*Torymus auratus*



*Torymus flavipes*



*Torymus geranii*

# Diapausa prolungata

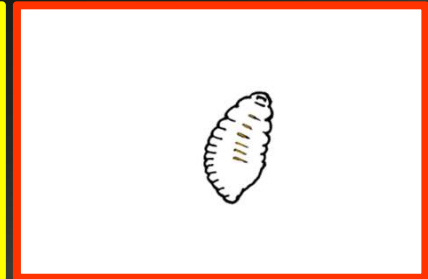
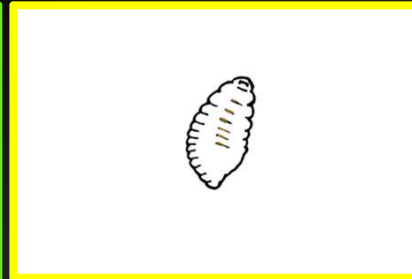
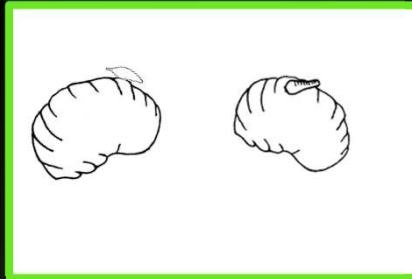
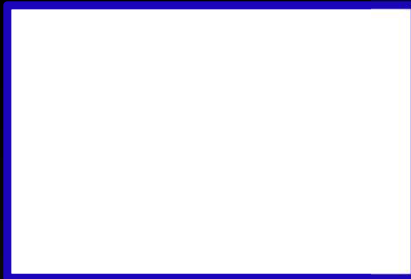
Inverno

Primavera

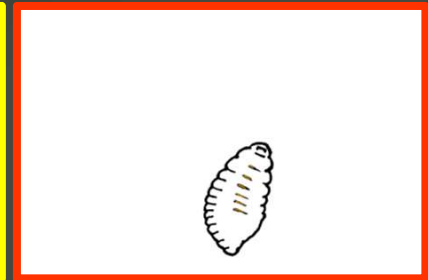
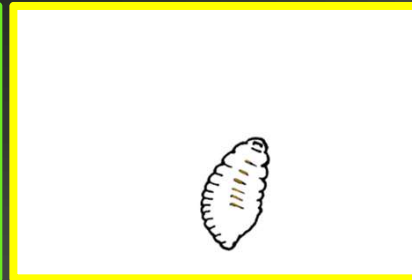
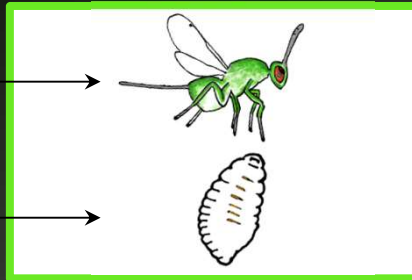
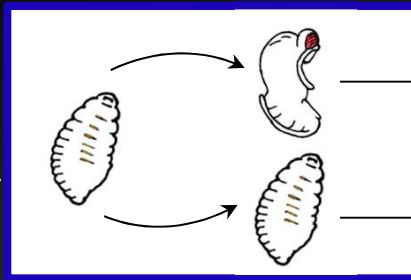
Estate

Autunno

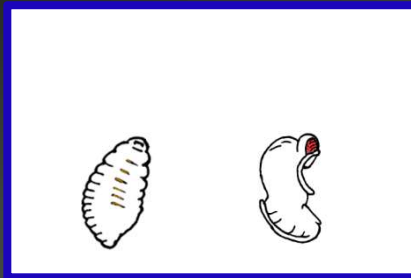
2011

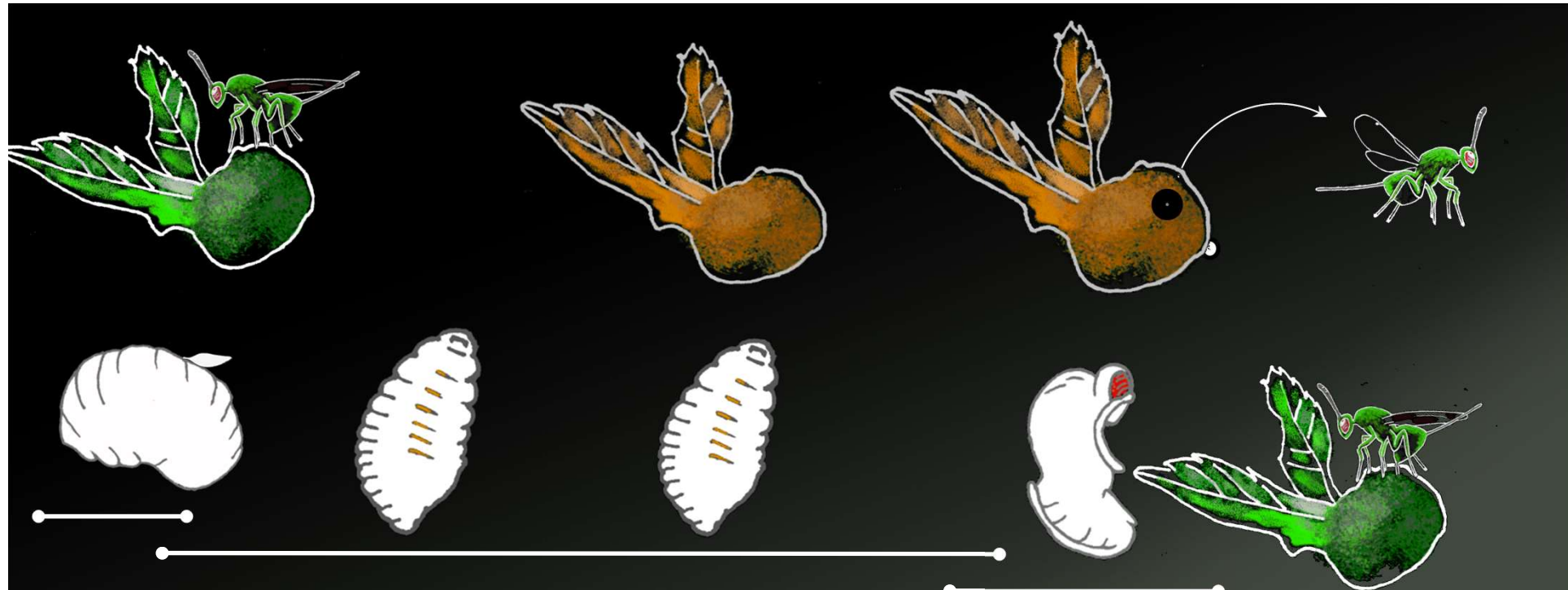


2012



2013





A<sub>prile</sub> M G L A S O N D G F M A M G L<sub>uglio</sub>



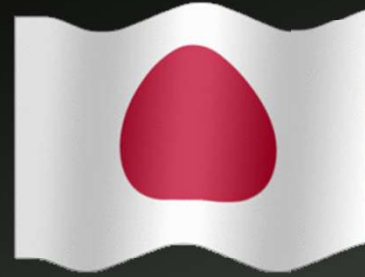
**NON ELIMINARE NULLA PER 2 ANNI**

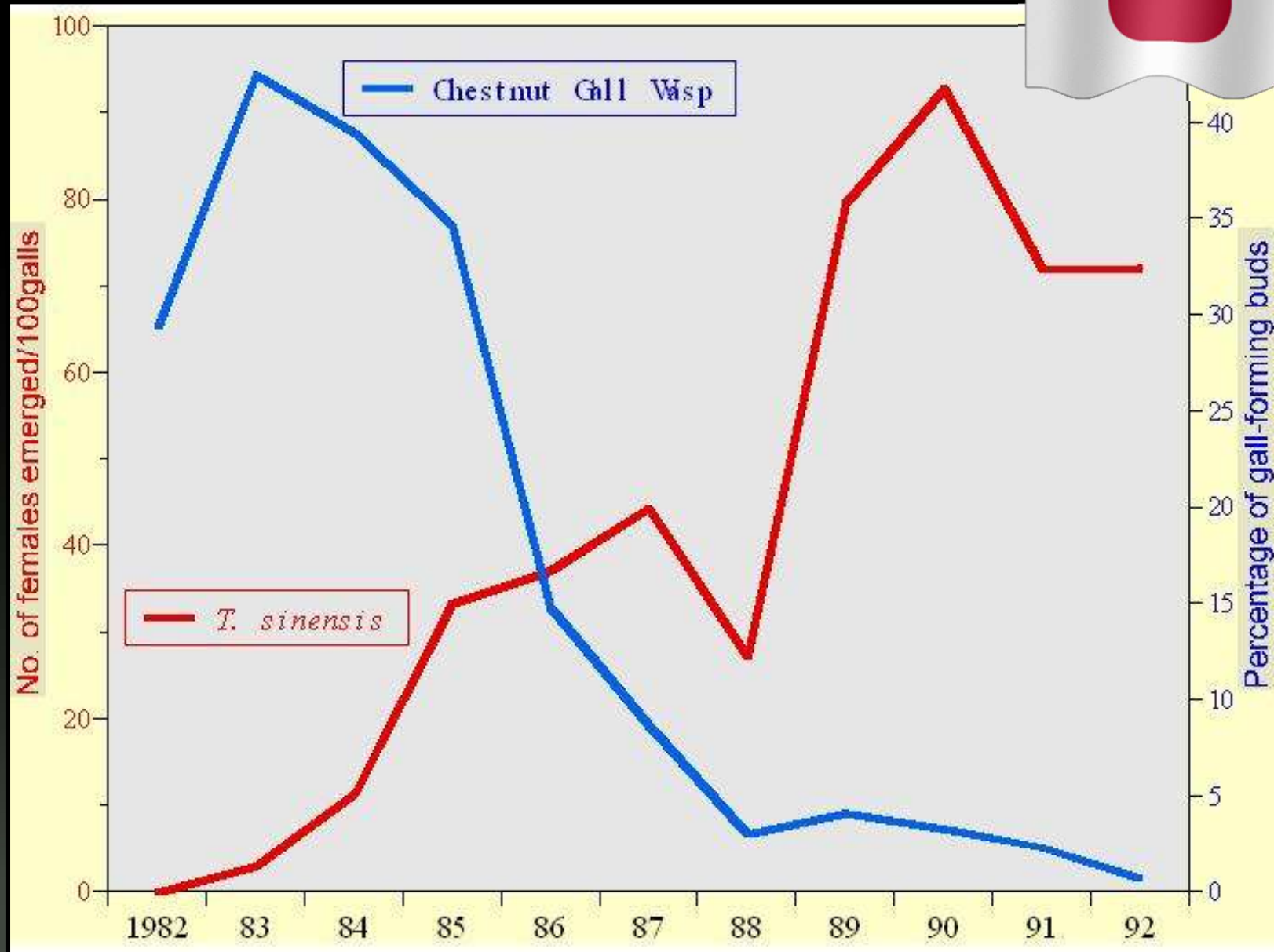
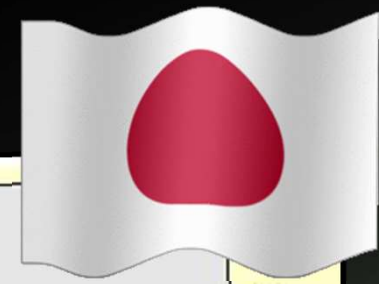
*Perché *Torymus sinensis*  
è un buon agente di controllo  
biologico?*

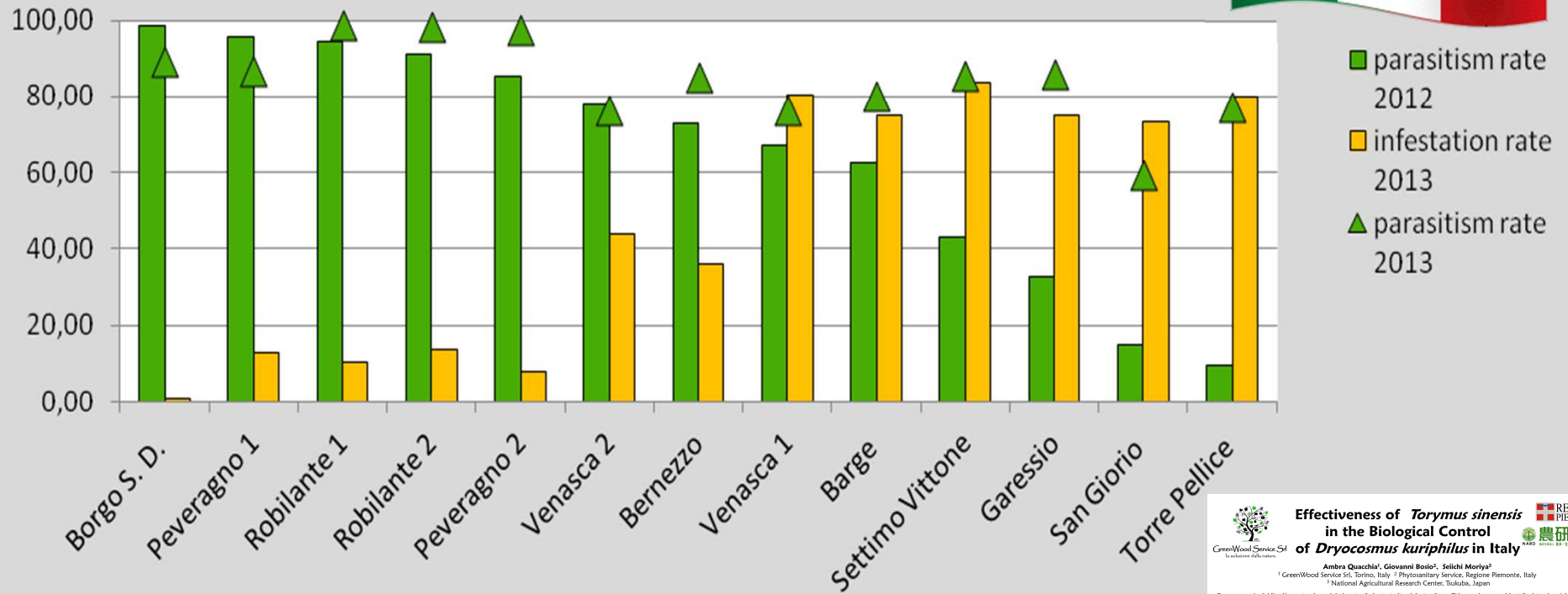
SPECIFICO

SINCRONIZZATO

EFFICACE





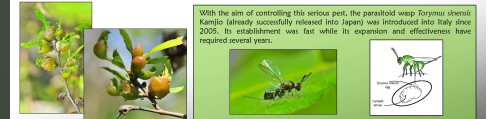


**Effectiveness of *Torimus sinensis* in the Biological Control of *Dryocosmus kuriphilus* in Italy**

Ambro Quacchia<sup>1</sup>, Giovanni Bolio<sup>2</sup>, Seiji Moriya<sup>3</sup>  
<sup>1</sup> GreenWood Service Srl, Torino, Italy; <sup>2</sup> Phytosanitary Service, Regione Piemonte, Italy; <sup>3</sup> National Agricultural Research Center, Tsukuba, Japan

*Dryocosmus kuriphilus* 'Yamamoto' is a global pest of chestnut. It originates from China and was accidentally introduced into several countries: Japan (1941), Korea (1958), Georgia-USA (1974) and Nepal (1999). It reached Italy at the end of 93' although the first record was in 2002.

The invasion of the pest is affecting many chestnut ecosystems in Europe. Currently it is widely distributed in Italy and established in four more European countries: France, Switzerland, Slovakia and Croatia. It was also reported in Hungary (2009), Netherland (2010), Austria (2011), Czech Republic (2012), Slovakia (2012), Spain (2012) and Germany (2012) but it is there considered to be eradicated or under eradication. Despite the eradication attempts, the area affected by the pest is constantly expanding.



With the aim of controlling this serious pest, the parasitoid wasp *Torimus sinensis* Kamijo (already successfully released into Japan) was introduced into Italy since 2005. Its establishment was fast while its expansion and effectiveness have required several years.

In order to outline the actual situation, several chestnut orchards and woods, in Piedmont Region, were investigated during 2012 and 2013. Data on infestation and parasitism were recorded.

The results show a drastic reduction in the gallway infestation rate (number of infested buds) in the sites where the parasitism rate (number of *T. sinensis* / number of gall cells) overcomes 75%.

In a wide area surrounding the first release points, the infestation rate is now below 15% with most of the galls localized on the leaf margin; this makes the damage to the chestnut trees almost negligible.



The time needed to reach the pest control varies among sites, mainly according to the number of releases in the same area, with some exception. The data collected prove the success of the biological control generated by *T. sinensis* in Italy.







Distanza fra i siti di rilascio  
8 km

4 km

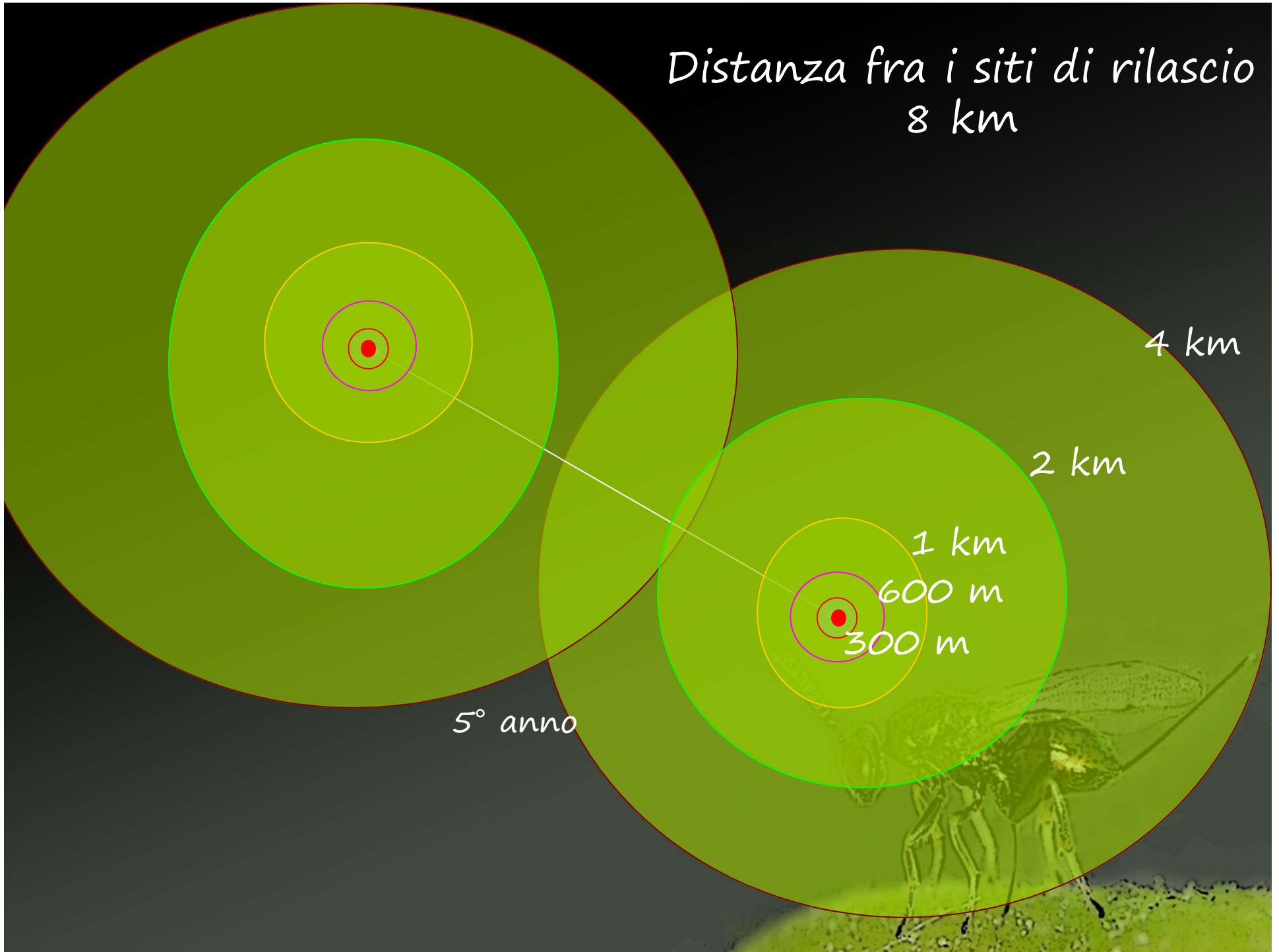
2 km

1 km

600 m

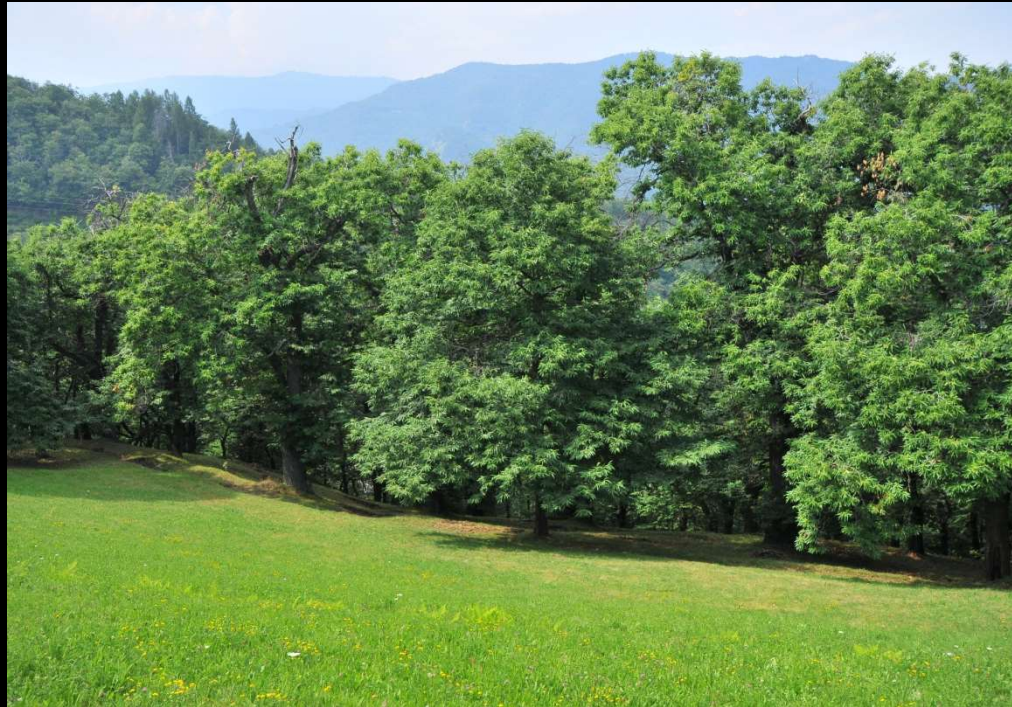
300 m

5° anno





2008



2013





## Considerazioni finali

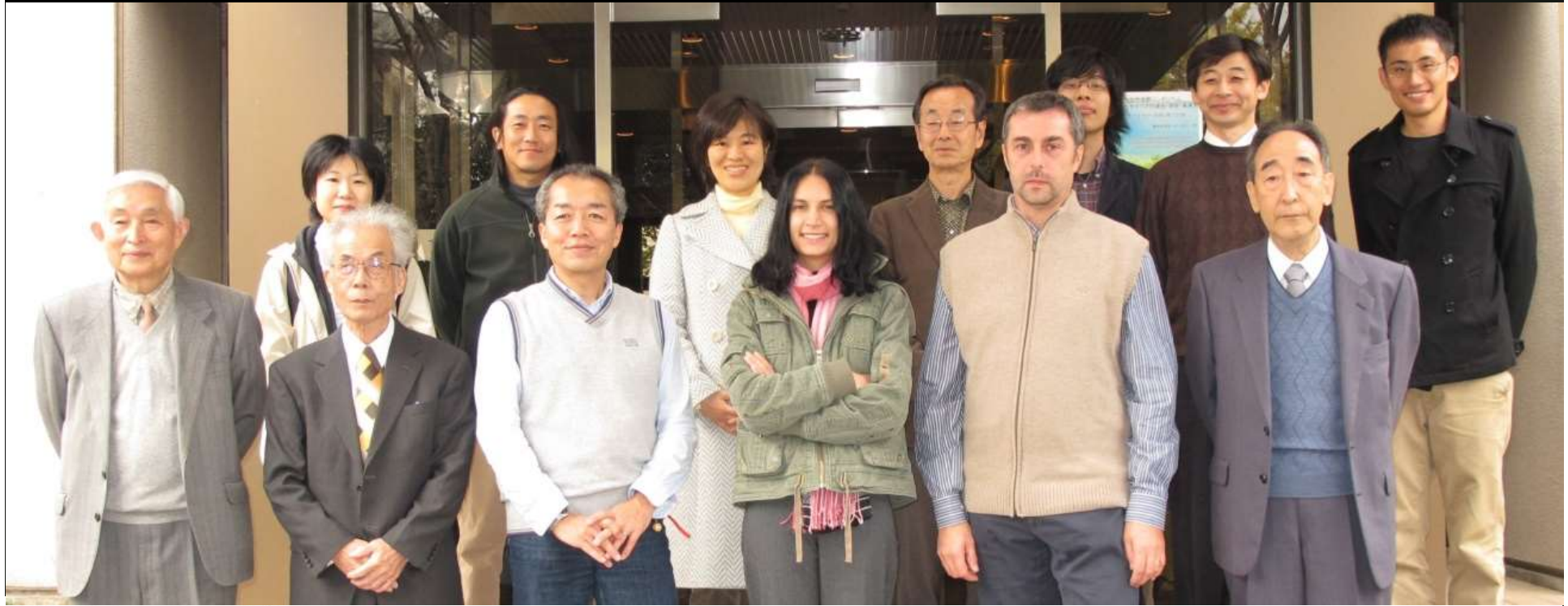
Il cinipide non sparirà mai,  
sarà in **EQUILIBRIO** con il suo limitatore

**SALVAGUARDARE** la popolazione di *Torymus sinensis*  
è importante per non interferire con l'equilibrio:

1. Attenzione a cosa eliminate
2. Attenzione agli insetticidi
3. Attenzione  
all'*Homo sapiens*!



# Ringraziamenti



Participants of the symposium

Front: Yôzô Murakami, Akio Ôtake, Seiichi Moriya, Ambra Quacchia, Giovanni Bosio, Kenji Umeya

Rear: Kaori Yara, Masatoshi Toyama, Midori Tuda, Masakazu Shiga, Nakatada Wachi, Yoshihisa Abe, Kazunori Matsuo

*Photo by N. Morimoto: November 24, 2009*