

BIOLOGICAL CONTROL PROGRAMS FOR FALL ARMYWORM *Spodoptera* *frugiperda* ON MAIZE

Spodoptera frugiperda

Spodoptera frugiperda: native pest from Americas

Main pest in crops as maize and sorghum

Secondary pest in tomato, cotton, rice, common bean, wheat and several vegetables

Brazil: *Spodoptera* spp. complex: *S. cosmioides* and *S. eridania*

Spodoptera complex



S. cosmioides



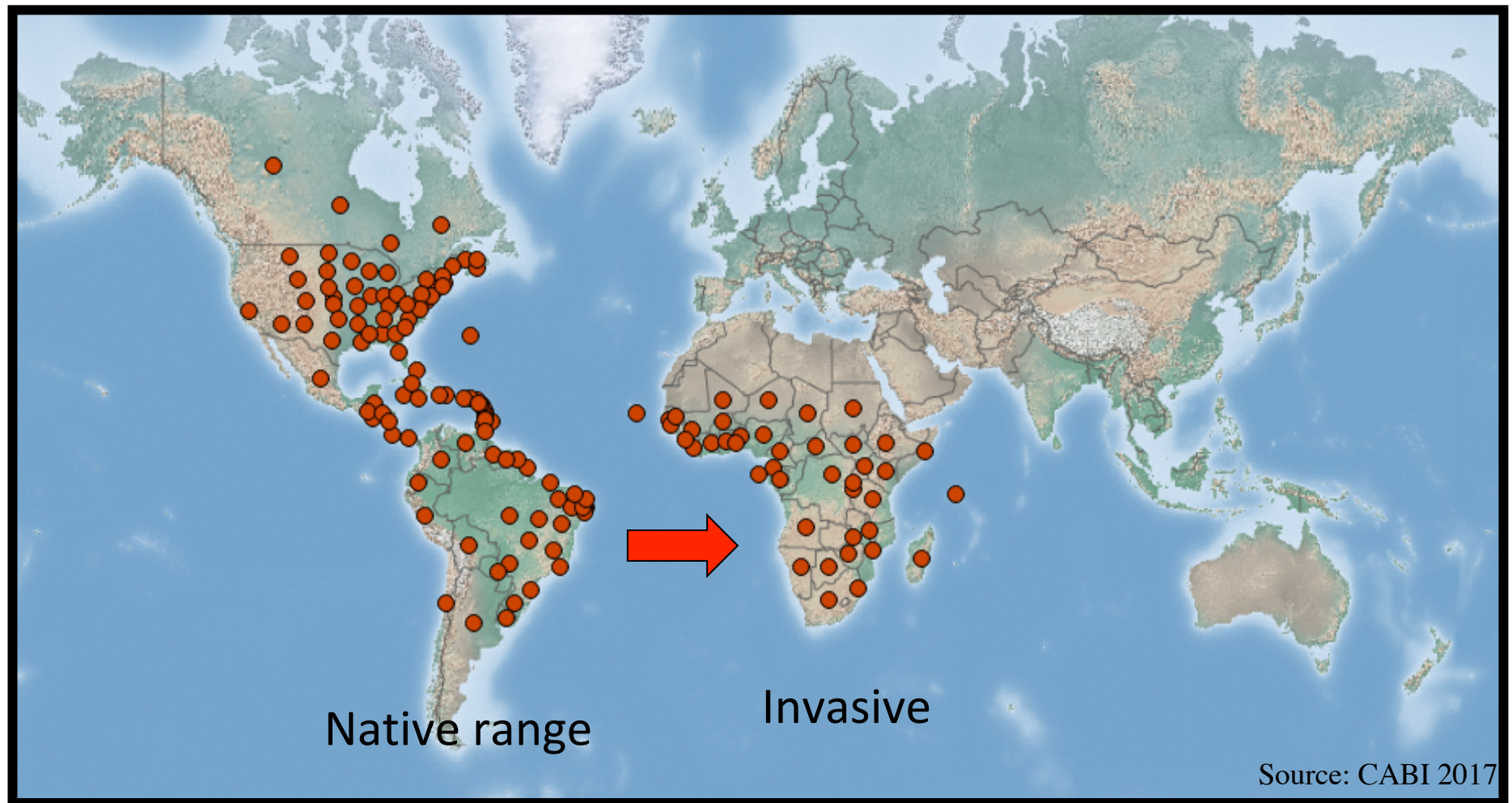
S. eridania



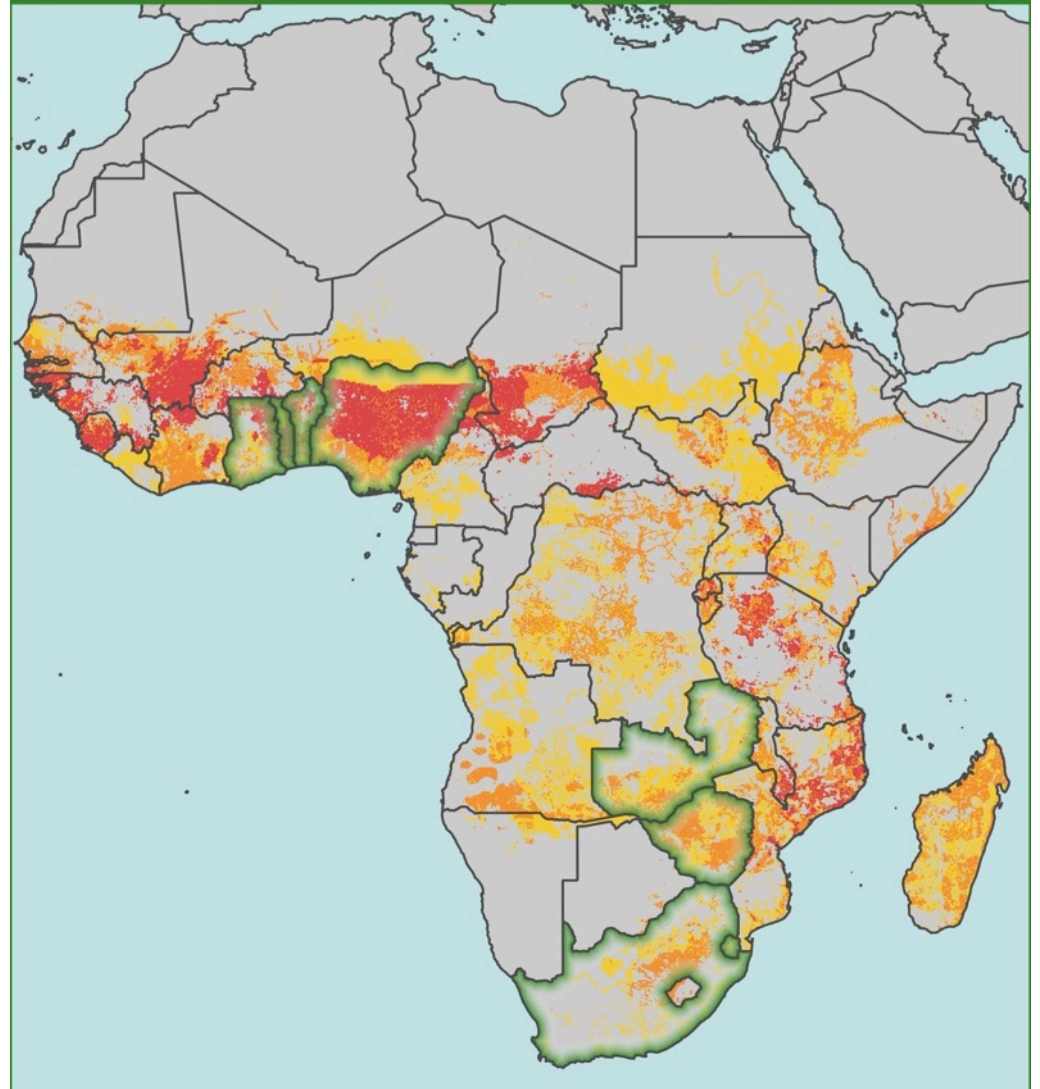
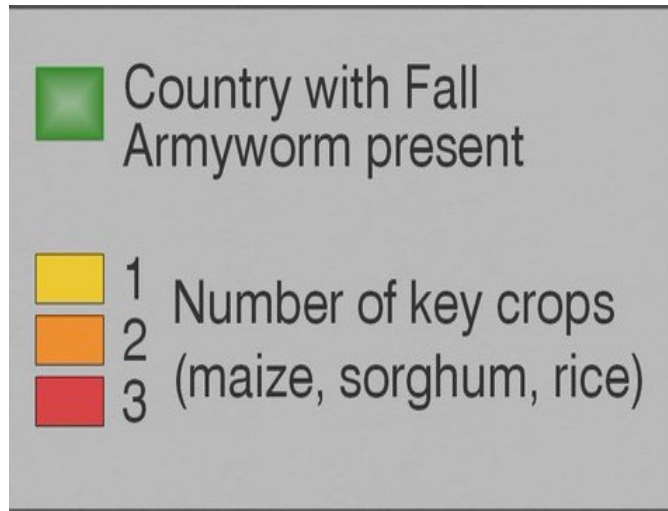
S. frugiperda

**Corn, Soybean, Cotton,
Tomato, Potato, etc.**

Spodoptera frugiperda global distribution



Spodoptera frugiperda and key Crops in Africa



Spodoptera frugiperda damage on Maize



Research Institutions partners in Brazil



Biological Control Companies partners in Brazil



Proposal: Sampling parasitoids of *S. frugiperda* in Latin America

Goals with this work

- To study **parasitoid complex** of *S. frugiperda* in non-sprayed conditions in its native range on maize
- Select parasitoids for **classical biological control** in Africa and shipment of the most promising species to Africa

Biological control programs

Egg parasitoids

Trichogramma

**Generalist
Aggressive
Large scale breeding**



BUT.... With limitations

Biological control programs

Egg parasitoids

Trichogramma sp.



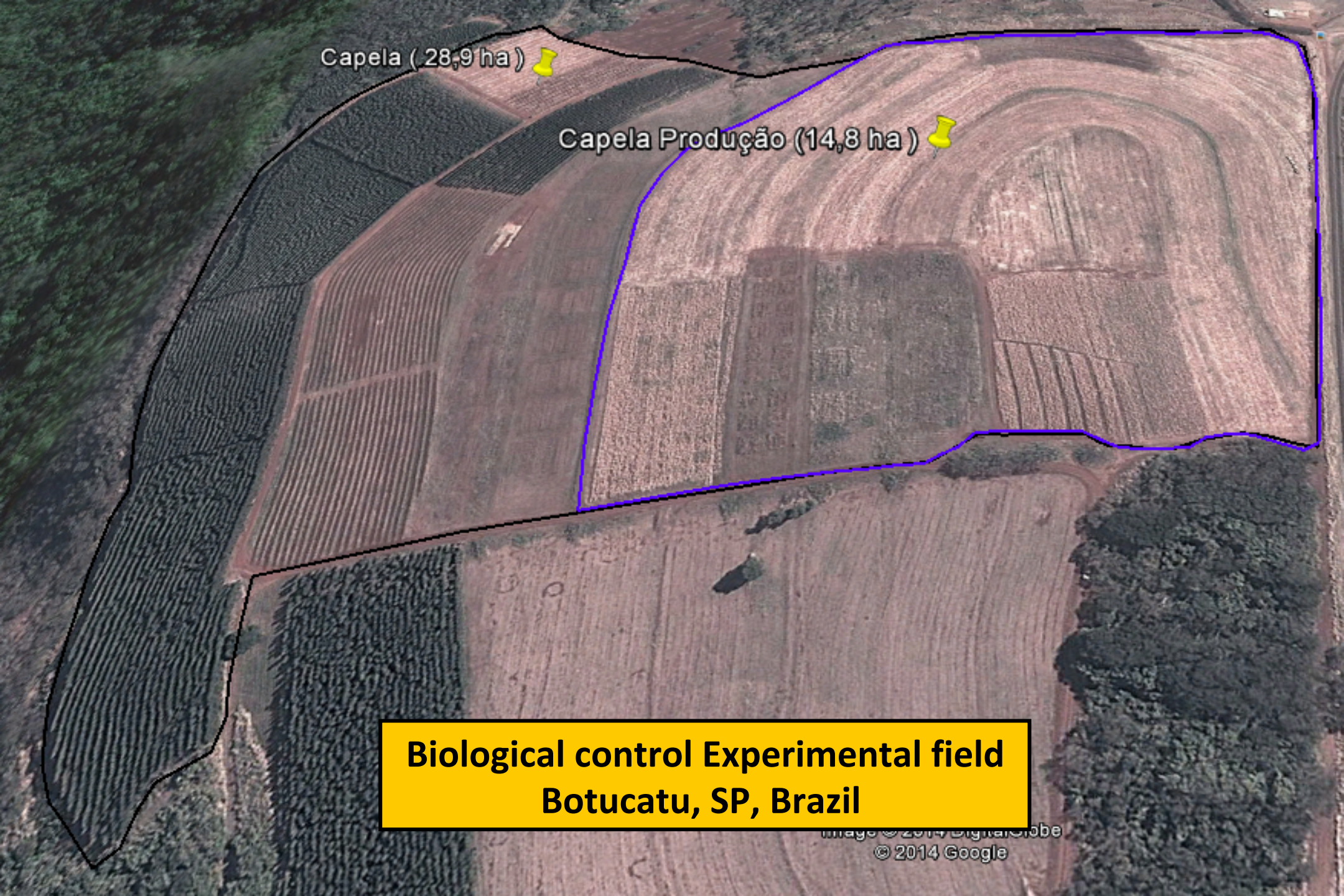
Spodoptera eggs

Telenomus remus

Biological control programs

Egg parasitoids





Capela (28,9 ha)

Capela Produção (14,8 ha)

**Biological control Experimental field
Botucatu, SP, Brazil**

Biological control programs

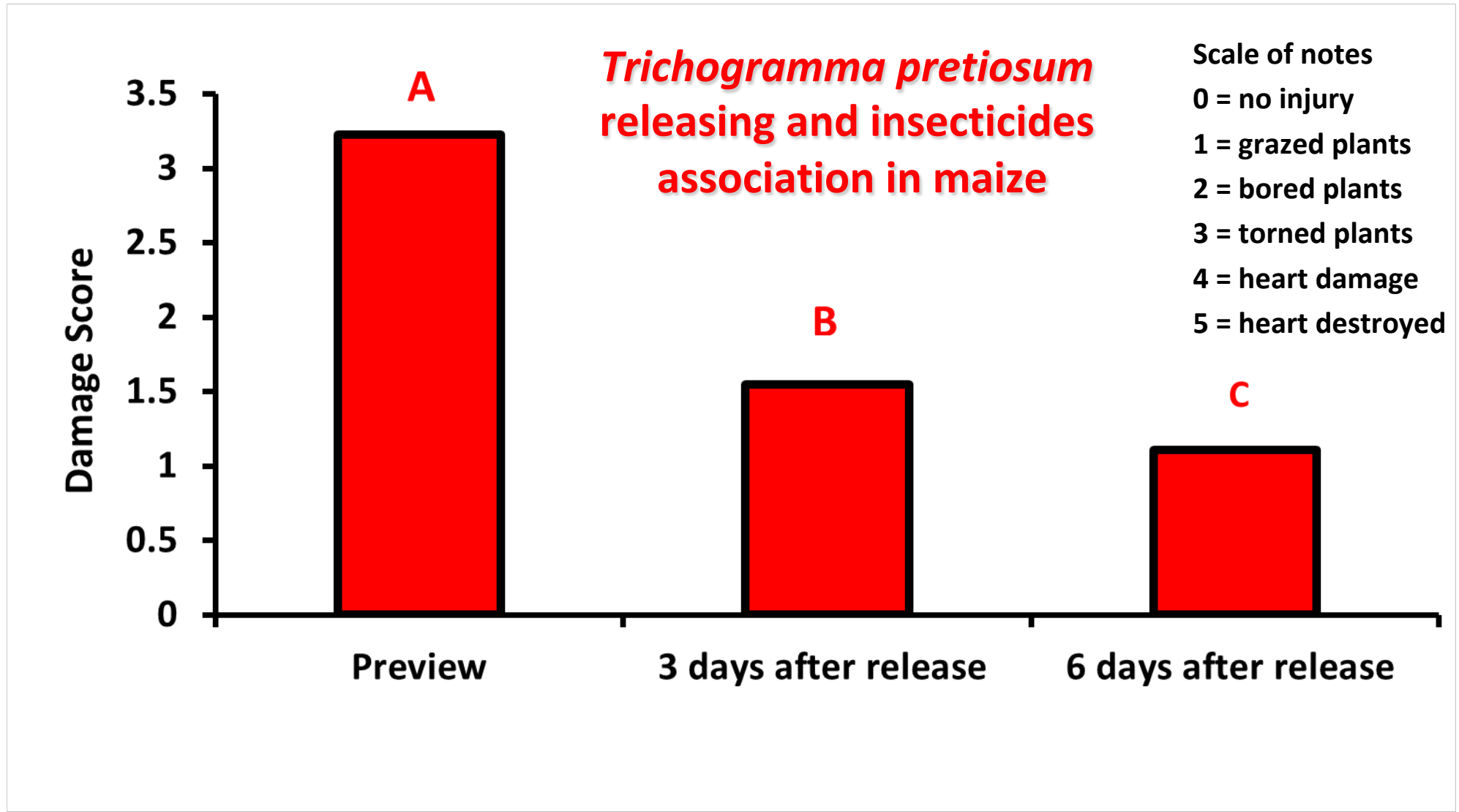
Egg Parasitoids

Despite the difficulty
of *Trichogramma*
spp. in controlling
Spodoptera spp.



Biological control programs

Egg parasitoids



Biological control programs

Egg parasitoids

Association

Telenomus remus

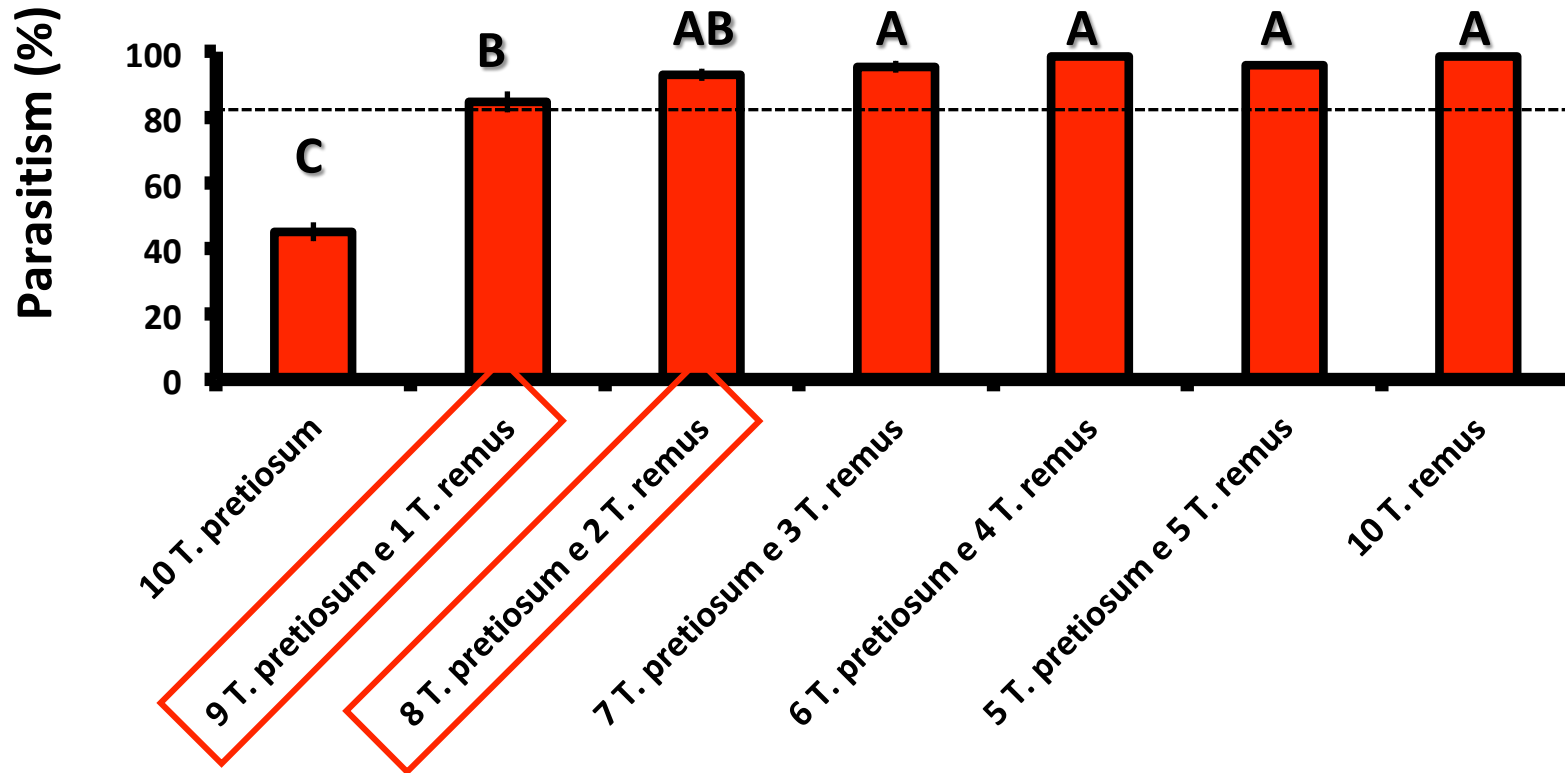


Trichogramma



Biological control programs

Egg parasitoids

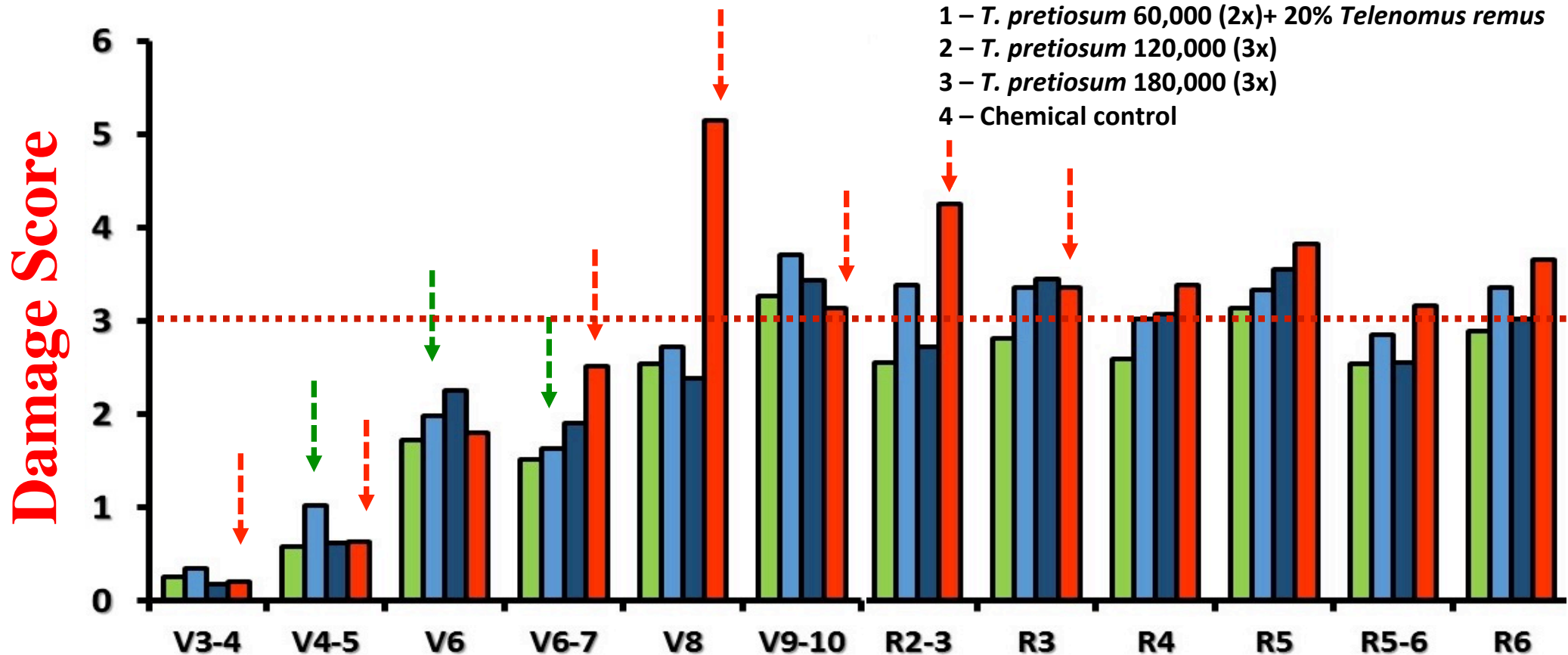


Goulart *et al.* (2011)

Association of egg parasitoids
S. frugiperda

Biological control programs

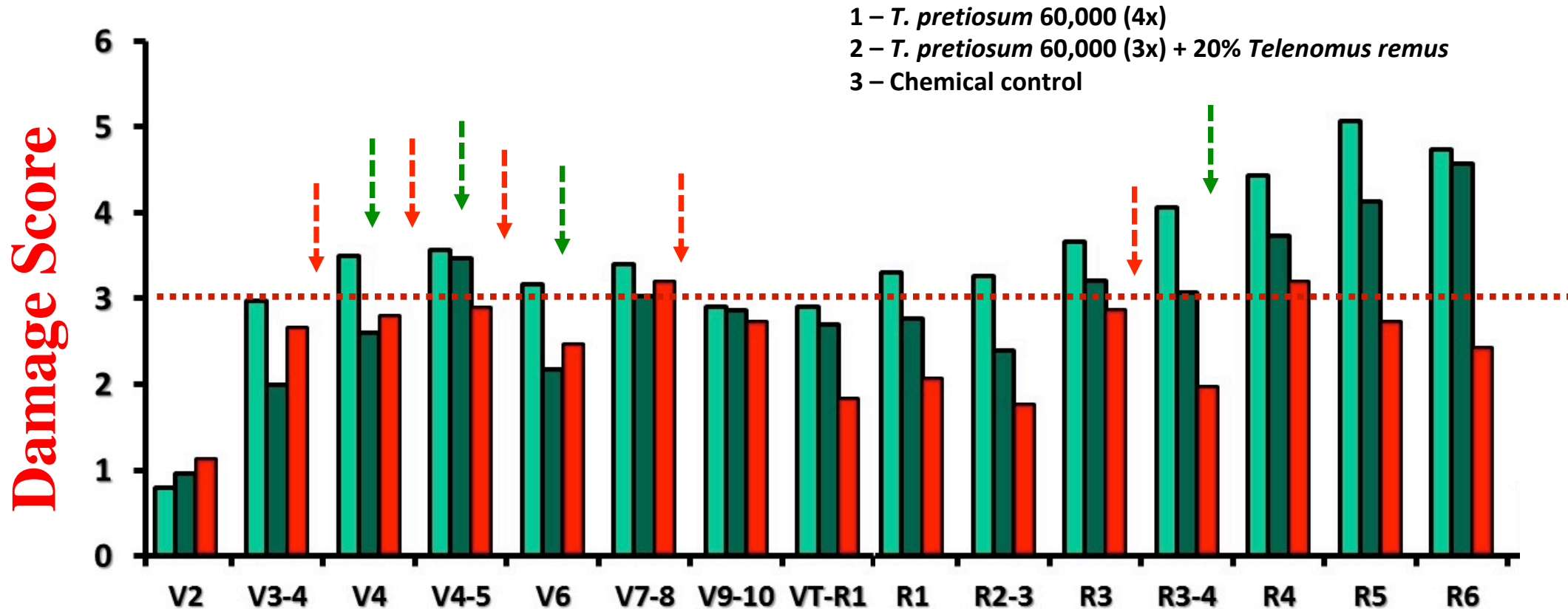
Egg parasitoids



**Control of *Spodoptera frugiperda* in maize
2016/2017**

Biological control programs

Egg parasitoids



**Control of *Spodoptera frugiperda* in maize
2015/2016**

Biological control programs

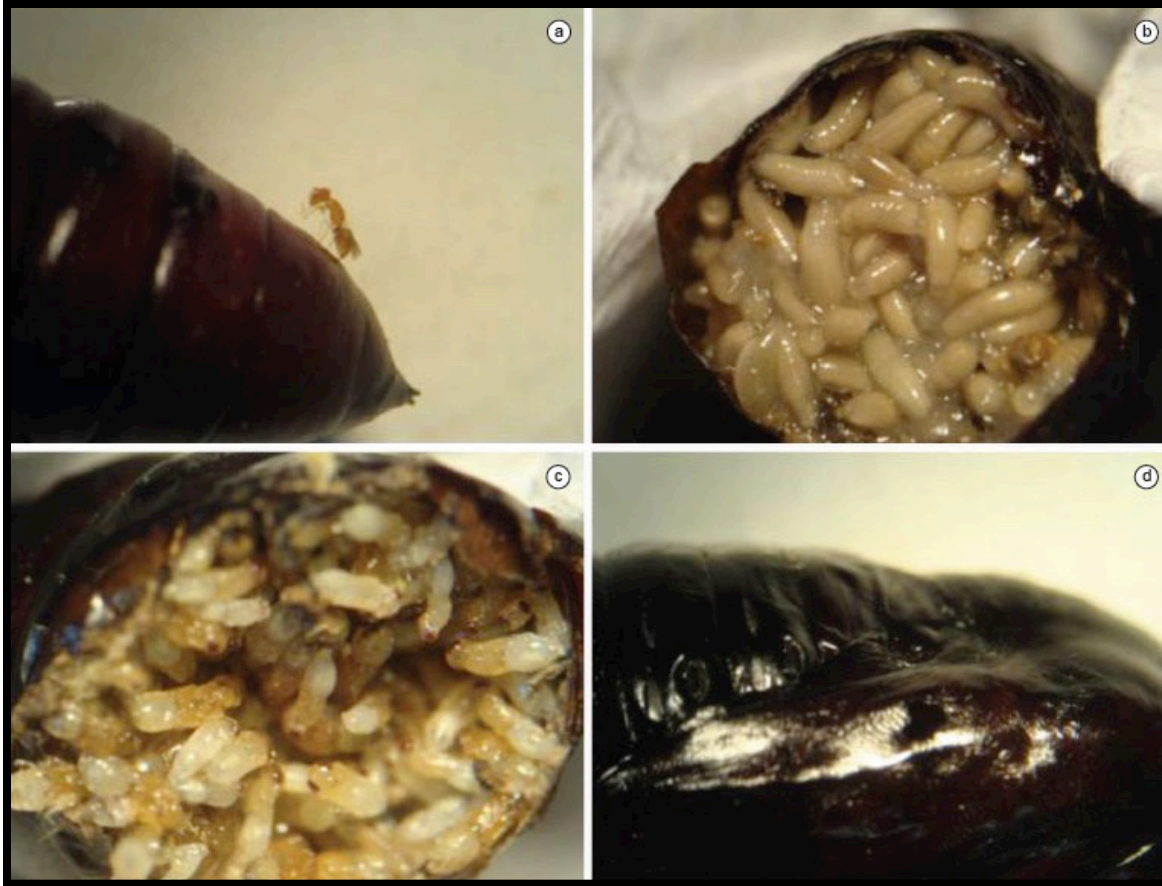
Pupae Parasitoids



Pupae parasitoids HYMENOPTERA: EULOPHIDAE

Biological control programs

Pupae Parasitoids



Generalist – several species

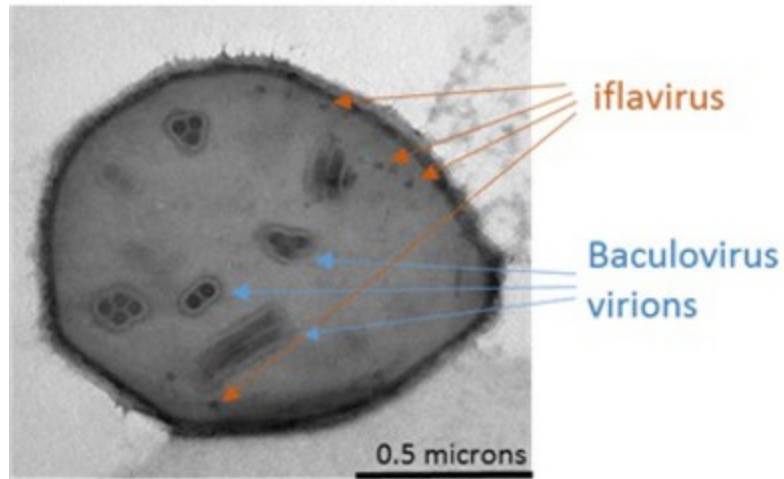
Palmistichus elaeisis

Trichospilus diatraeae

Tetrastichus howardii

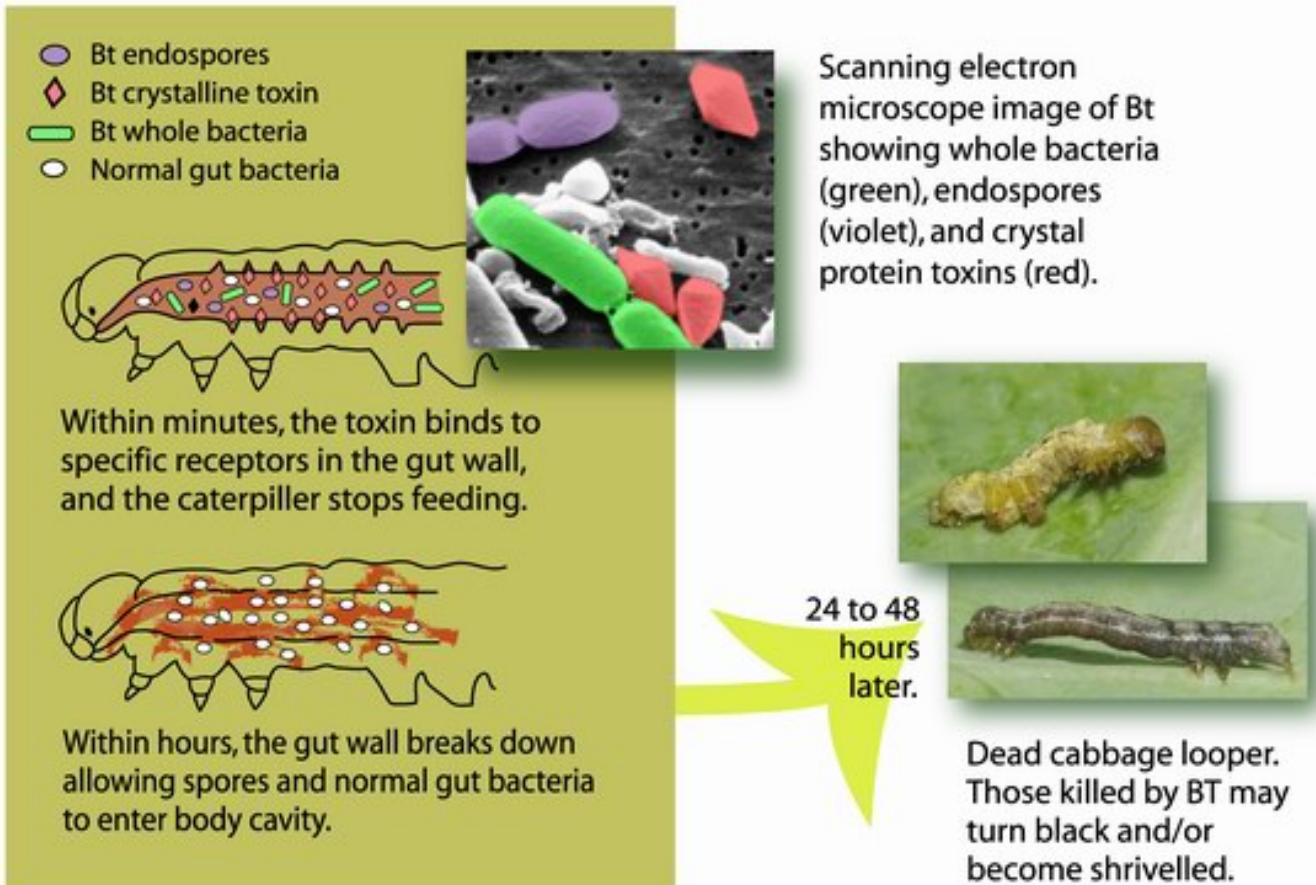
Biological control programs

Microbials: entomopathogenic virus SfNPV



Biological control programs

Microbials: *Bacillus thuringiensis*



http://thailand.ipm-info.org/bt/Bt_Basics.htm

Questions?



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