Evaluacion del impacto de *Thaumastocoris peregrinus* en la productividad de 3 especies de *Eucalyptus*

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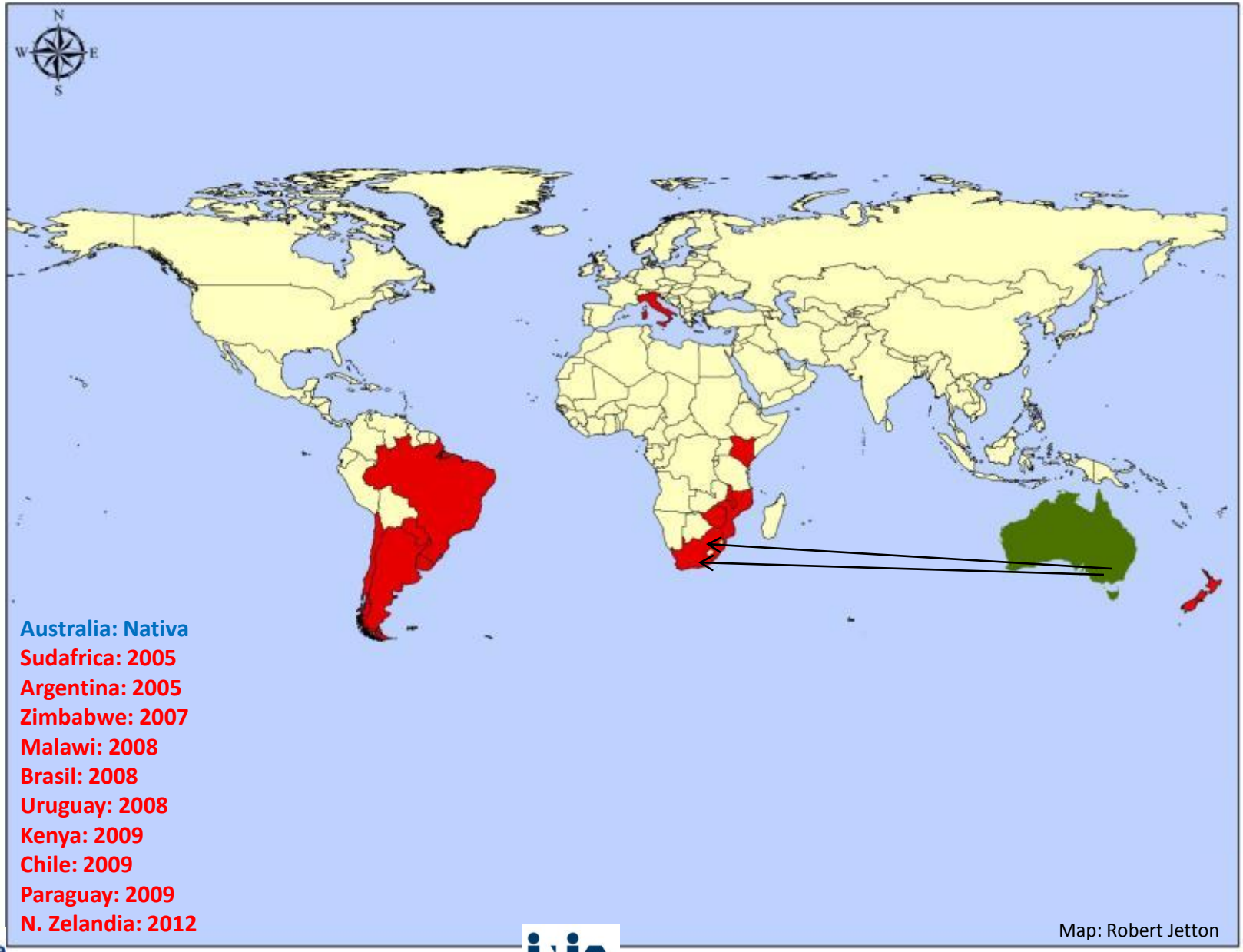
Thaumastocoris peregrinus

-- Introducciones --



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Thaumastocoris peregrinus

- “Chinche del Eucalipto”, “Chinche del Bronceado” ó “Bronze bug”
- Hemiptera: Thaumastocoridae
- Fitófago
- Se alimenta de hojas maduras en especies suceptibles
- Provoca degradacion de la clorofila – color bronceado de las hojas
- Reportada como plaga de plantaciones de eucalyptus en el año 2005
- Nativa de Australia

Thaumastocoris peregrinus

-- Sintomas y signos --

Thaumastocoris peregrinus
-- Manejo en plantaciones --

Control Biologico

- *Cleruchoides noackae*
- Hymenoptera: Mymaridae
- Parasitoide de huevos
- Nativo de Australia
- Liberaciones :
  - Chile 2010
  - Brazil 2012
  - Uruguay 2013
  - Sudafrica 2013

Liberaciones de *C. noackae* en Uruguay

Impacto de la chinche de eucalipto
-- Objetivo general del ensayo --

- ✓ Comparar los factores de crecimiento (altura y diametro) de arboles/plantaciones afectadas por *T. peregrinus* con respecto a aquellos protegidos mediante la utilizacion de insecticidas sistemicos en especies de *Eucaliptus* de interes en rotacion temprana.
- ✓ Resultados esperados:
  - Evaluar la propia tecnica de incorporacion del insecticida a la fisiologia del arbol en las condiciones de sitio dadas.
  - Estimacion del valor economico del daño producido por la chinche.
  - Entender como la especie en cuestion, el sitio y la edad de la plantacion afectan la suceptibilidad de *T. peregrinus.*

Impacto de la chinche de eucalipto
-- Especies de interes y ubicacion de ensayo --

1) *E. benthamii*: alta suceptibilidad, excelentes crecimientos a pesar de los altos niveles de ataque

2) *E. grandis*: baja suceptibilidad, extensamente plantado en Weyerhaeuser en Uruguay.

3) *E. grandis* x *camaldulensis GC 172*: suceptibilidad media observada.

***E. benthamii* en La Maragata , Rivera, Uruguay**

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Impacto de la chinche de eucalipto
-- Diseño de ensayo --

	E. grandis		*GC 172*		*E. benthamii*	
Sitio bueno	I	C	I	C	I	C
	C	I	C	I	C	I
Sitio pobre	I	C	I	C	I	C
	C	I	C	I	C	I

C = Control

I = Insecticida

24 subparcelas de tratamiento x 25 arboles = 600 arboles en total

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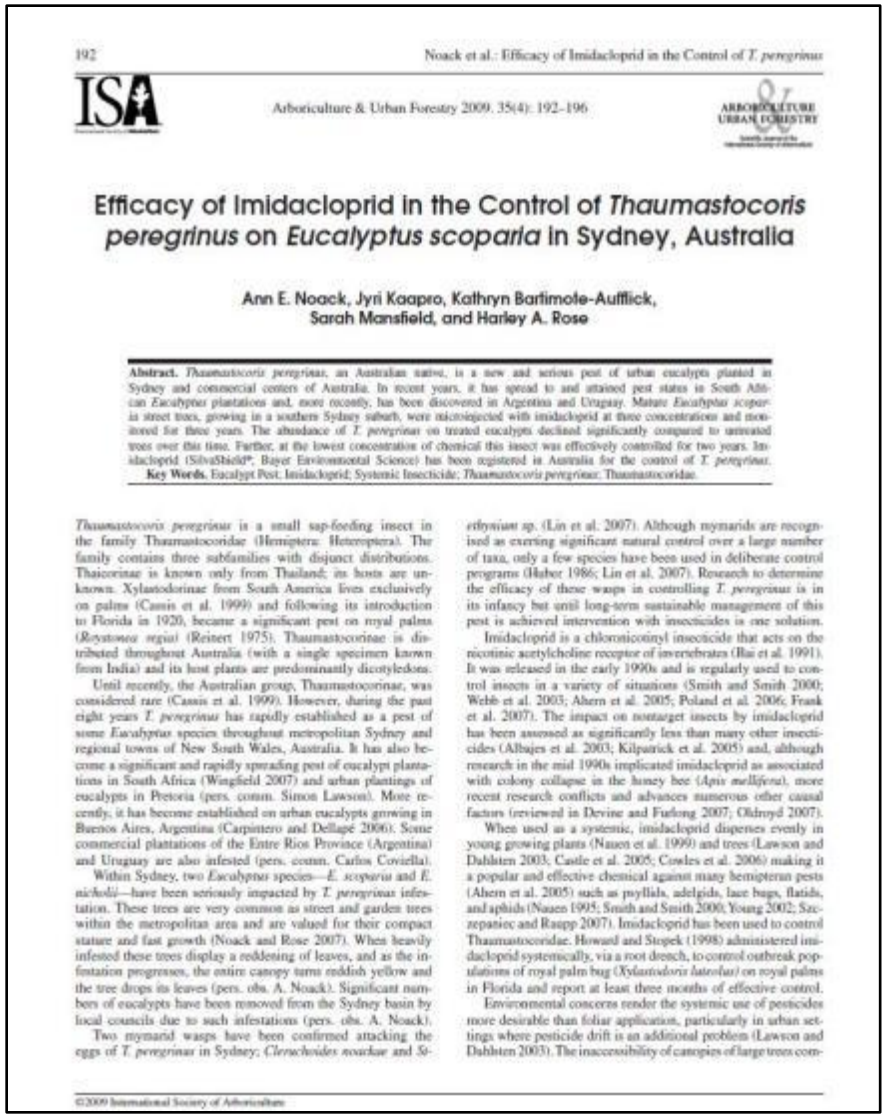
Impacto de la chinche de eucalipto
-- Tratamientos con Insecticida --

- I.A. = imidacloprid (200 g/L)
- Sistemico
- Recomendacion = 0.15 g/cm dap
- Sidewinder Tree Injector
- Efectividad = 2 años
- Septiembre 2012 & 2013
- 3.0 ml (20% I.A.)/arbol



192 Noack et al.: Efficacy of Imidacloprid in the Control of *T. peregrinus*

ISA Arboriculture & Urban Forestry 2009. 35(4): 192–196

Efficacy of Imidacloprid in the Control of *Thaumastocoris peregrinus* on *Eucalyptus scoparia* in Sydney, Australia

Ann E. Noack, Jyri Kaapro, Kathryn Barfimote-Aufflick, Sarah Mansfield, and Harley A. Rose

Abstract. *Thaumastocoris peregrinus*, an Australian native, is a new and serious pest of urban eucalypts planted in Sydney and commercial centers of Australia. In recent years, it has spread to and attained pest status in South African *Eucalyptus* plantations and, more recently, has been discovered in Argentina and Uruguay. Mature *Eucalyptus scoparia* street trees, growing in a southern Sydney suburb, were microinjected with imidacloprid at three concentrations and monitored for three years. The abundance of *T. peregrinus* on treated eucalypts declined significantly compared to untreated trees over this time. Further, at the lowest concentration of chemical this insect was effectively controlled for two years. Imidacloprid (SilvaShield®; Bayer Environmental Science) has been registered in Australia for the control of *T. peregrinus*.
Key Words. Eucalypt Pest; Imidacloprid; Systemic Insecticide; *Thaumastocoris peregrinus*; Thaumastocoridae.

Thaumastocoris peregrinus is a small sap-feeding insect in the family Thaumastocoridae (Hemiptera: Heteroptera). The family contains three subfamilies with disjunct distributions. Thaicorinae is known only from Thailand; its hosts are unknown. Xylastodorinae from South America lives exclusively on palms (Cassis et al. 1999) and following its introduction to Florida in 1920, became a significant pest on royal palms (*Roystonea regia*) (Reinert 1975). Thaumastocorinae is distributed throughout Australia (with a single specimen known from India) and its host plants are predominantly dicotyledons.

Until recently, the Australian group, Thaumastocorinae, was considered rare (Cassis et al. 1999). However, during the past eight years *T. peregrinus* has rapidly established as a pest of some *Eucalyptus* species throughout metropolitan Sydney and regional towns of New South Wales, Australia. It has also become a significant and rapidly spreading pest of eucalypt plantations in South Africa (Wingfield 2007) and urban plantings of eucalypts in Pretoria (pers. comm. Simon Lawson). More recently, it has become established on urban eucalypts growing in Buenos Aires, Argentina (Carpintero and Dellapé 2006). Some commercial plantations of the Entre Rios Province (Argentina) and Uruguay are also infested (pers. comm. Carlos Coviella).

Within Sydney, two *Eucalyptus* species—*E. scoparia* and *E. nicholii*—have been seriously impacted by *T. peregrinus* infestation. These trees are very common as street and garden trees within the metropolitan area and are valued for their compact stature and fast growth (Noack and Rose 2007). When heavily infested these trees display a reddening of leaves, and as the infestation progresses, the entire canopy turns reddish yellow and the tree drops its leaves (pers. obs. A. Noack). Significant numbers of eucalypts have been removed from the Sydney basin by local councils due to such infestations (pers. obs. A. Noack).

Two mymarid wasps have been confirmed attacking the eggs of *T. peregrinus* in Sydney; *Cleruchoides noackae* and *Stethynium* sp. (Lin et al. 2007). Although mymarids are recognised as exerting significant natural control over a large number of taxa, only a few species have been used in deliberate control programs (Huber 1986; Lin et al. 2007). Research to determine the efficacy of these wasps in controlling *T. peregrinus* is in its infancy but until long-term sustainable management of this pest is achieved intervention with insecticides is one solution.

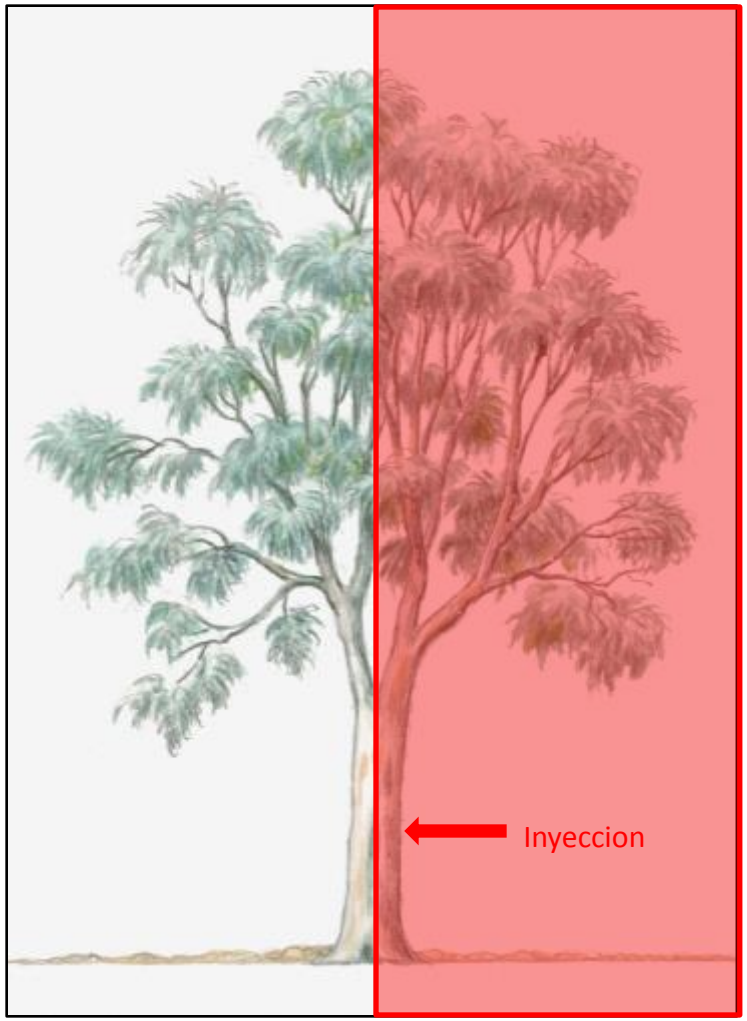
Imidacloprid is a chloronicotinyl insecticide that acts on the nicotinic acetylcholine receptor of invertebrates (Bai et al. 1991). It was released in the early 1990s and is regularly used to control insects in a variety of situations (Smith and Smith 2000; Webb et al. 2003; Ahern et al. 2005; Poland et al. 2006; Frank et al. 2007). The impact on nontarget insects by imidacloprid has been assessed as significantly less than many other insecticides (Albajes et al. 2003; Kilpatrick et al. 2005) and, although research in the mid 1990s implicated imidacloprid as associated with colony collapse in the honey bee (*Apis mellifera*), more recent research conflicts and advances numerous other causal factors (reviewed in Devine and Furlong 2007; Oldroyd 2007).

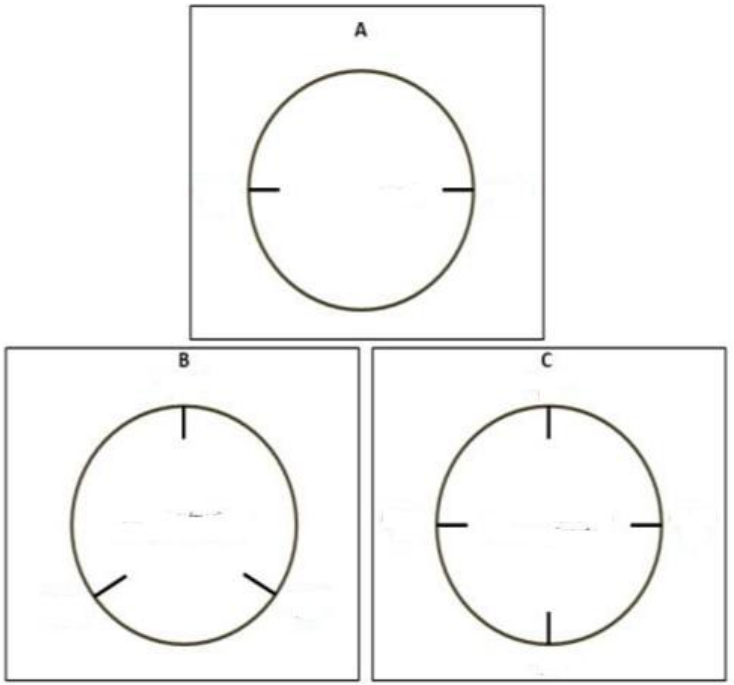
When used as a systemic, imidacloprid disperses evenly in young growing plants (Nauen et al. 1999) and trees (Lawson and Dahlsten 2003; Castle et al. 2005; Cowles et al. 2006) making it a popular and effective chemical against many hemipteran pests (Ahern et al. 2005) such as psyllids, adelgids, lace bugs, flatids, and aphids (Nauen 1995; Smith and Smith 2000; Young 2002; Szczepaniec and Raupp 2007). Imidacloprid has been used to control Thaumastocoridae. Howard and Stepek (1998) administered imidacloprid systemically, via a root drench, to control outbreak populations of royal palm bug (*Xylastodoris luteolus*) on royal palms in Florida and report at least three months of effective control.

Environmental concerns render the systemic use of pesticides more desirable than foliar application, particularly in urban settings where pesticide drift is an additional problem (Lawson and Dahlsten 2003). The inaccessibility of canopies of large trees com-

Impacto de la chinche de eucalipto
-- Aplicacion del Insecticida --

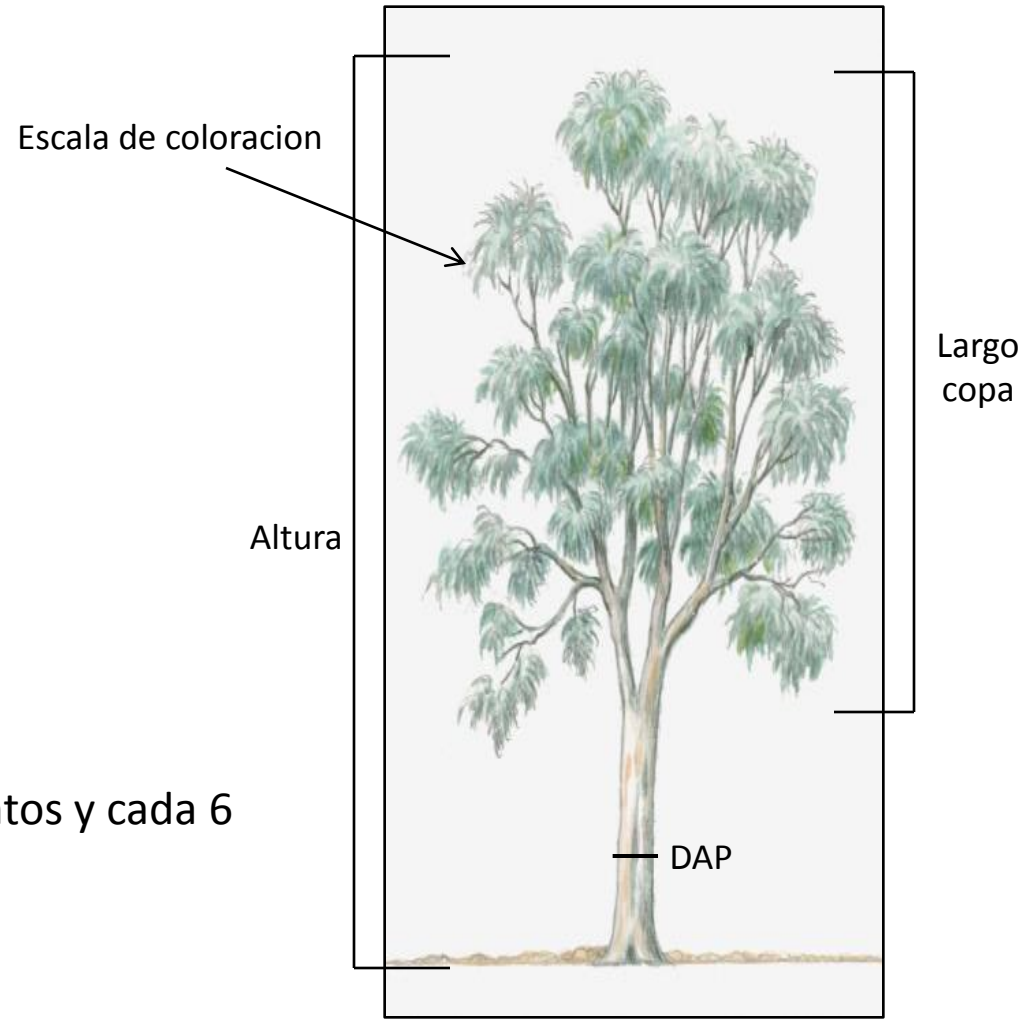
Impacto de la chinche de eucalipto
-- Puntos de inyeccion --





Impacto de la chinche de eucalipto
-- Toma de datos --

- DAP (cm)
- Altura total (m)
- Largo de copa (m)
- Escala de coloracion
    - Bronceamiento/clorosis foliar
      0: nula
      1 = 1–25%
      2 = 25–50%
      3 = 50-75%
      4 = 75-100%
- Toma de datos una vez pre tratamientos y cada 6 meses post

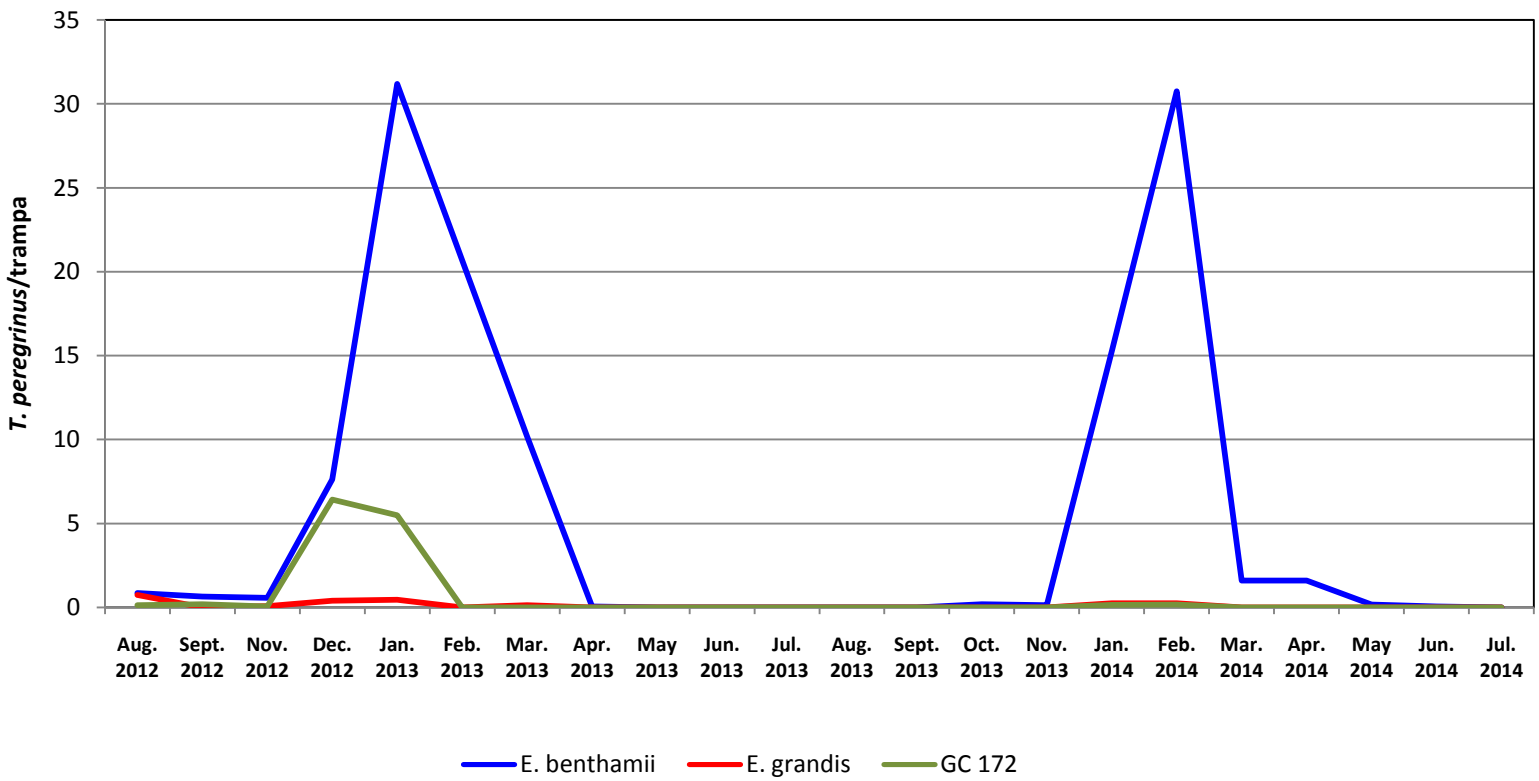


Impacto de la chinche de eucalipto
-- Disposicion de trampas --

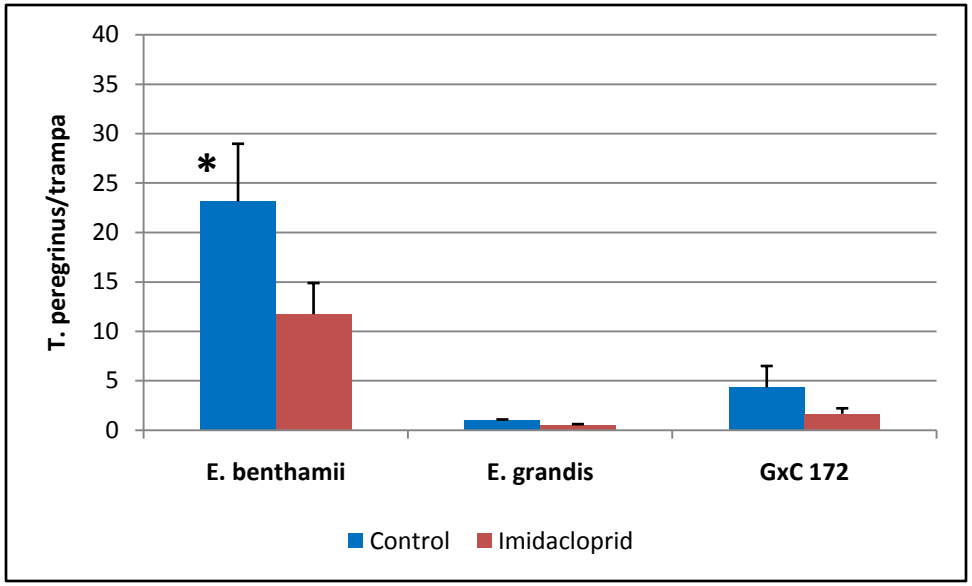
- Monitoreo con trampas amarillas ubicadas sobre fuste a 6 y 10m
- Arbol central de cada parcela de tratamiento
- 8 trampas/ensayo; 48 trampas en total
- Colecta mensual
- INIA: Identificacion y conteo de insectos

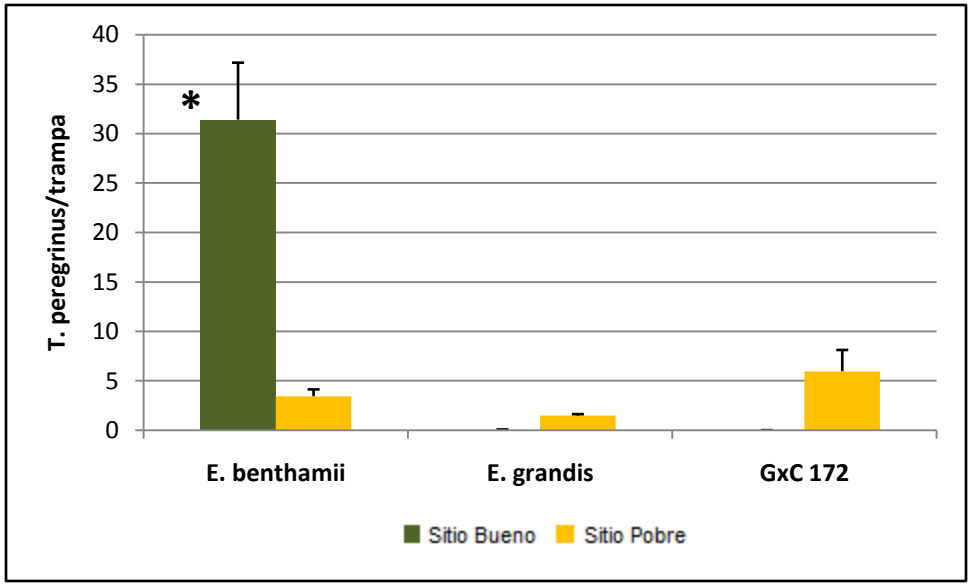
Trampas en GC 172 - Establec. Los Ranchos

Thaumastocoris Impact Study
-- Evolucion de capturas --



Impacto de la chinche de eucalipto
-- Capturas segun tratamiento y sitio --





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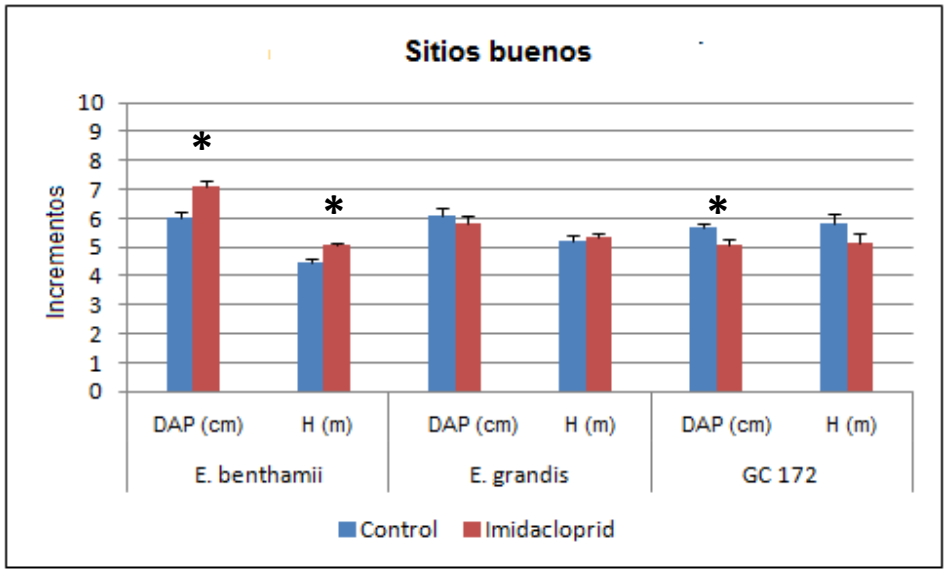
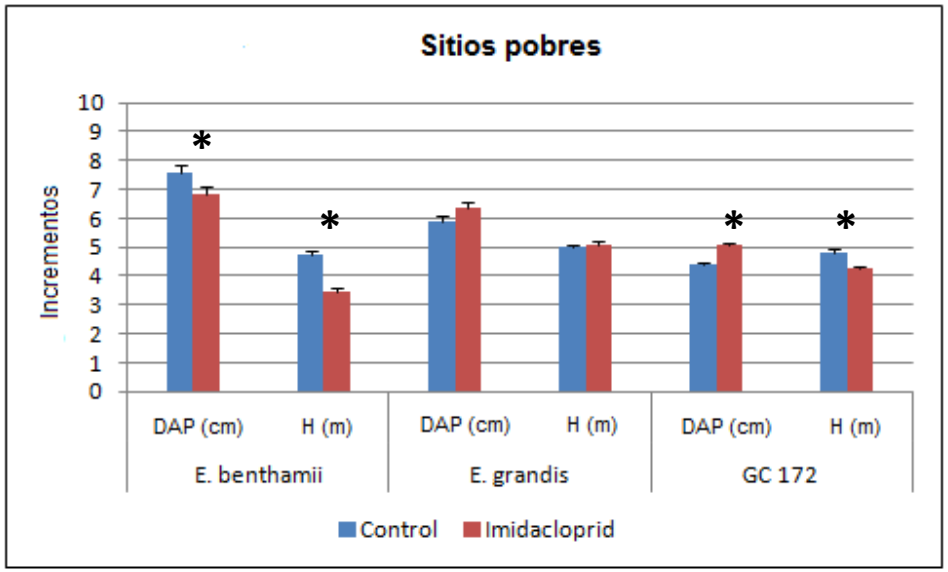
Impacto de la chinche de eucalipto
-- Dap y H en tratamientos --





* = estadisticamente significativo en $\alpha \leq 0.05$

Impacto de la chinche de eucalipto
-- Colecta de hojas y analisis NIR --

- Colecta de muestras de follaje de 4 arb/parcelas tratadas y 1 arbol/parcelas control
- De cada arbol de colectaron hojas de los 4 puntos cardinales
- Tests combinados NIR y ELISA para determinar presencia/ausencia & cuantificacion

Thaumastocoris Impact Study
-- Conclusiones --

- Los resulados son preliminares pero prometedores.
- Cuando la poblacion del insecto es alta (*E. benthamii* en sitio bueno) los datos de crecimiento sugieren que esta tecnica puede resultar efectiva para evaluar su impacto en el crecimiento.
- Si la presion poblacional es baja (2013-2014) se observa un efecto negativo a causa del stress en los arboles inyectados. Esta tecnologia debe ser utilizada con cuidado.
- Las trampas amarillas pueden no estar revelando los verdaderos niveles poblacionales de la chinche (feromonas?).
- Las aplicaciones iniciales pueden no haber sido lo efectivas que se esperaba.
- IAF puede ser una herramienta de utilidad para describir los impactos sobre la productividad del cultivo


Muchas Gracias!