

# New technologies improve the use *Cleruchoides noackae* (Hymenoptera: Mymaridae) in biocontrol of *Thaumastocoris peregrinus* (Hemiptera: Thaumastocoridae) in Eucalyptus Plantations

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The bronze bug *Thaumastocoris peregrinus* Carpintero and Dellapé (Hemiptera: Thaumastocoridae), is an exotic sap-sucking insect introduced in Brazil in 2008, causing *important losses in Eucalyptus spp. wood production*. The attacked area by the pest reach 245.000 ha in 2012, but in 2016 the area decreased to 80.000 ha. The main management strategy for *T. peregrinus* is biocontrol using an egg parasitoid *Cleruchoides noackae* Lin and Huber (Hymenoptera: Mymaridae) introduced in Brazil from Australia in 2012. Two mass-rearing protocols for *C. noackae* were developed by Embrapa Florestas and are available for researchers, forestry companies and farmers. Since 2012, *C. noackae* was released in many states from Brazil: Minas Gerais, São Paulo, Espírito Santo, Bahia, Rio Grande do Sul, Mato Grosso do Sul, Paraná, Distrito Federal, Goiás, Tocantins, Piauí and Maranhão. The establishment of *C. noackae* in the field was confirmed for Minas Gerais, São Paulo, Espírito Santo, Bahia, Rio Grande do Sul and Maranhão states. Field and laboratory evaluations showed that *C. noackae* presents a parasitism rate of 50%. The duration of the parasitoid life cycle (egg-adult) is affected by temperature, ranging from 14 (30°C) to 46 days (15°C). The storage of *T. peregrinus* eggs for 15 days at 5°C is viable for the multiplication of *C. noackae* in laboratory, without affecting the reproduction and development of the parasitoid, and the storage period of parasited eggs with six days of development is viable during 7 days at 5°C. The supplies of food containing honey plus pollen increase the parasitism, longevity and survival of *C. noackae*. Thus, as temperature affects *C. noackae* field establishment and parasitism rate the climatic changes will interfere directly on its effectivity as biocontrol agent. Storing eggs and providing food supply are tools which help optimize a mass-rearing of *C. noackae* and provide flexibility for field releases and management of the bronze bug in Brazilian eucalypt plantations.

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