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Combination of genetic resistance and management of field borders: towards an effective and sustainable control of *Aphis gossypii* outbreaks and virus epidemics in cantaloupe melon crops

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S4.4 – Combination of genetic resistance and management of field borders: towards an effective and sustainable control of *Aphis gossypii* outbreaks and virus epidemics in cantaloupe melon crops

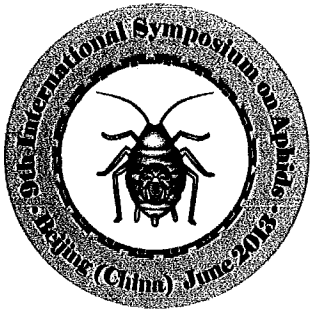
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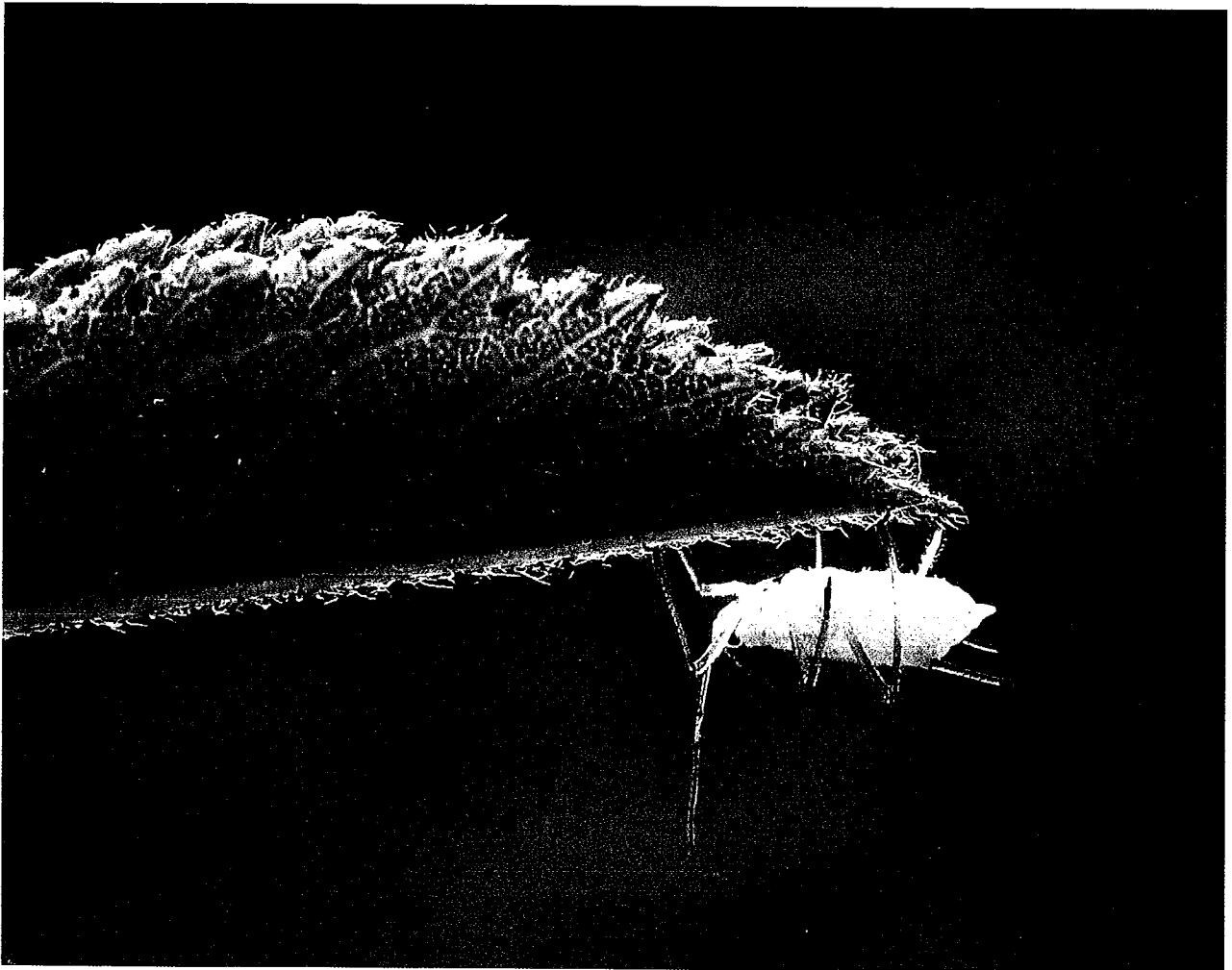
Aphis gossypii is a major pest of cantaloupe melon crops, causing direct damage (sap uptake) and indirect damage (virus transmission). The cantaloupe gene *Vat* confers resistance to colonization by *A. gossypii* and resistance to the non-persistent viruses (CMV, WMV, etc) carried by *A. gossypii*. It is however ineffective in blocking the transmission of viruses carried by other aphid species and its use is thus generally coupled with aphicide treatments to limit virus transmission by non-colonizing aphids. Moreover, due to its intraspecific variability, *A. gossypii* can adapt to various selective pressures (host plants, insecticides); this adaptation ability enhances the risk of resistance breakdown. In France, cantaloupe protection faces a double challenge: to reinforce the effectiveness of *Vat* in a context of reducing pesticide use, and ensure the sustainability of *Vat* in a context of increasing *Vat* deployment. The hypothesis tested in this project is that an appropriate management of field borders can contribute to regulating the populations of aphids and/or their virus load, thereby reducing the risks of virus epidemics and resistance breakdown. Indeed, literature suggests that flower strips can participate in pest biological control by favoring natural enemies (predators and parasitoids), and strips of non host plants can protect crops from non-persistent viruses by allowing aphids to probe on healthy plants and thus to lose their virus load before reaching the crops. An experimental field approach was initiated to compare three types of field border management (bare soil, grass strip and flower strip) on the effectiveness and sustainability of *Vat*.

Keywords: aphid; *Cucumis melo*; integrated pest management; *Vat*.



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