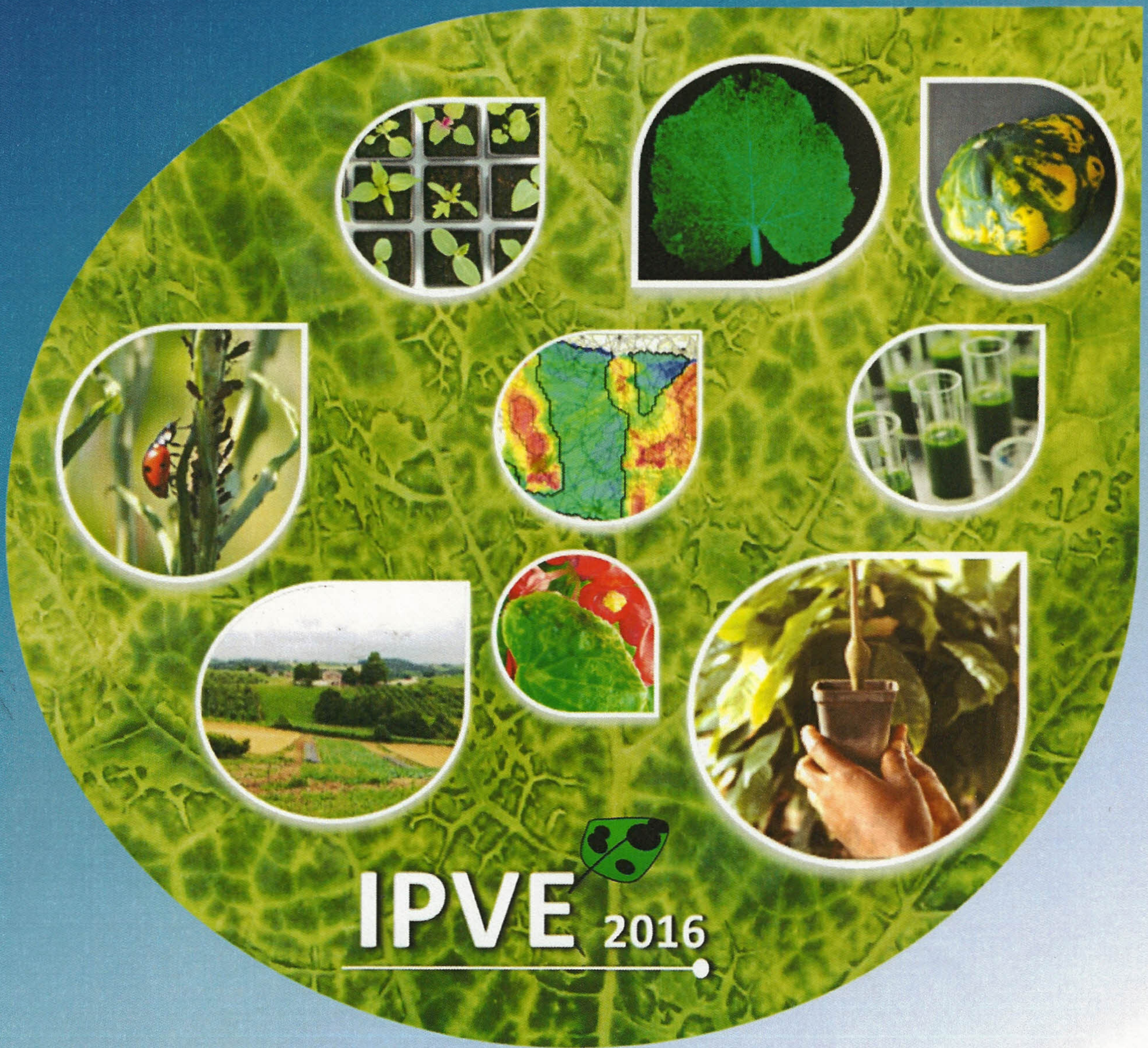
The resistance to virus triggered by aphid inoculation in Vat melon is not systemic

Pascale Mistral, Nathalie Boissot

Building bridges between disciplines for sustainable management of plant virus diseases



13th International Plant Virus Epidemiology Symposium

6-10 june 2016, Avignon, FRANCE

Programme and Abstracts

THE RESISTANCE TO VIRUS TRIGGERED BY APHID INOCULATION IN *VAT* MELON IS NOT SYSTEMIC.

Mistral, P. and Boissot, N.

INRA, UR1052, GAFL, CS 60094, F-84143 Avignon
pascale.mistral@avignon.inra.fr
nathalie.boissot@avignon.inra.fr

BACKGROUND and OBJECTIVES

Host plant resistance is an essential mean of controlling virus epidemics in crops. Resistance to viruses in plant belongs to three major families, either recessive or dominant resistance genes, as well as the antiviral defense system based on RNA silencing. Most NBS-LRR antiviral resistances are triggered by the recognition of the NBS-LRR protein and a virus protein, playing the role of avirulence factor. The *Vat* resistance gene in melon is unique among the dominant resistance to virus genes. It is a CC-NBS-LRR gene, it is triggered by the recognition between an aphid avirulence factor, delivered in plant cells by *Aphis gossypii* puncturing, and the CC-NBS-LRR protein produced by Vat plants. This resistance is efficient against unrelated viruses transmitted on the non persistent mode (Boualem et al., 2016). We investigated if the resistance to virus triggered by *A. gossypii* in *Vat* plants is systemic.

MATERIAL and METHODS

Two batches of *Vat* plants were prepared, one pre-inoculated with CMV (*Cucumber Mosaic Virus)* by *A. gossypii* NM1 clone, the other one without pre-inoculation. The *A. gossypii* clone NM1, is known to be highly efficient in triggering virus resistance on *Vat* plants (Boissot et al., 2016). 1h30, 12h, 24h after the pre-inoculation with NM1, the two batches were inoculated with CMV either mechanically or using *Myzus persicae* as vector. Pre-inoculated plants were inoculated on the same leaf than for the pre-inoculation with NM1. Plantlets with and without symptoms were recorded 2 weeks later.

RESULTS

All plantlets only pre-inoculated with CMV by NM1 aphids were symptomless. All plantlets mechanically inoculated with CMV, both pre-inoculated and not, exhibited symptoms. More than 80% of the plantlets inoculated using *M. persicae* as vector exhibited symptoms without significant difference between pre-inoculated or not pre-inoculated plantlets. The results showed that a pre-inoculation with CMV inoculated by *A. gossypii* NM1 clone did not protect the *Vat* plants against viruses inoculated 1h30, 12h, 24h later, mechanically or using *M. persicae*.

CONCLUSIONS

The resistance to virus triggered by *A. gossypii* inoculation in *Vat* melon is not systemic at the leaf level. This results reinforced the hypothesis that *Vat* plant responses triggered by *A. gossypii* aphids puncturing, block the viruses in the inoculated cell or the neighboring cells (Sarria Villada et al., 2009).

REFERENCES

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