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Genetic and functional characterization of the peach-*Myzus persicae* interaction: towards breeding for durable resistance within integrated orchard management

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Abstract: Integrated production of fruit and vegetable species is one major field of research at Avignon INRA centre. Breeding for durable resistance to the green peach aphid, *Myzus persicae* (Sulzer) and other enemies of peach crop (*Prunus persica* L. Batsch) has been initiated fifteen years ago. Several sources of resistance are available among wild and domesticated peaches. Because all resistance genitors used in these programmes are of poor agronomic value, improvement of fruit quality is a long-lasting process. In order to avoid the erosion of the level of plant resistance during this process, the detailed analysis of the underlying mechanisms was undertaken. Here, we present some aspects of the work carried out on the genetic and physiological mechanisms of peach resistance to *M. persicae*. In addition to the analysis of the plant-aphid interaction under the influence of plant genetic factors, the effects of technical operations, such as winter pruning or nitrogen fertilization, on the aphid population dynamics are being investigated. Varietal resistance combined to cultural practices can be considered as an ultimate strategy to increase the efficacy of aphid control in orchards.

Key words: green peach aphid, peach leaf curl, powdery mildew, sharka disease, host plant resistance, major gene, QTL, cultural practices, nitrogen fertilization

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