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Selection of processing tomato genotypes with high acyl sugar content that are resistant to the tomato pinworm

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ABSTRACT. Acyl sugars are allelochemicals present at high concentrations in leaves of accessions of the wild tomato *Solanum pennellii*; they confer resistance to a large number of arthropod pests, including the tomato pinworm, *Tuta absoluta* (Lepidoptera, Gelechiidae). Accession 'LA716', with high contents of acyl sugars in the leaves, was used as a source of resistance to start a genetic breeding program of processing cultivated tomato, *S. lycopersicum*. We selected plants of the F_2 generation of an interspecific cross (*S. lycopersicum* cv. 'Redenção' x *S. pennellii* 'LA716') for extremes of concentrations (high and low) of acyl sugars in the leaves and evaluated the resistance of selected genotypes to the tomato pinworm, compared with plants of the parental and F_1 generations. The concentrations of acyl sugars present in the genotypes selected for high contents were close to those of *S. pennellii* 'LA 716', while the genotypes with low concentrations of acyl sugars were close to cultivar 'Redenção'. The F_1 hybrid ('Redenção' x 'LA716') had intermediate concentrations of acyl sugars, but was closer to Redenção, indicating that the inheritance of this type of

character is due to a recessive major gene, along with minor genes with additive effects. There was a direct association between high contents of acyl sugars and non-preference for oviposition and suppression of larval development, indicating that the allelochemical acts through mechanisms of non-preference for oviposition and through antibiosis. Genotypes with high contents of acyl sugars were more effective in reducing the damage caused by the tomato pinworm. Genotypes RVTA-2010pl#94 and RVTA-2010pl#31, selected for high contents of acyl sugars, showed a good level of resistance to *T. absoluta*, similar to the wild genotype LA716. These genotypes are promising for use in a breeding program for developing commercial processing tomatoes.

Key words: *Solanum pennellii*; Allelochemical; *Tuta absoluta*; Pest resistance

