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# Field evaluation of the resistance of two processing tomato cultivars to the parasitic *Phelipanche ramosa*

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## Introduction

Several mechanisms underlying the resistance of plants to the *Phelipanche ramosa* parasite have been described (Pérez-de-Luque et al., 2008). Considered that this parasite requires stimulants exuded by the host roots in order to germinate and reach the host root, varieties that exude these stimulants at low levels or secrete inhibitors could be suitable for reducing parasite infection (El-Halmouch Y., 2006; Serghini et al., 2001).

## Materials and Methods

The trial was carried out in 2018, in the countryside of Rignano (Foggia province) to evaluate the susceptibility to *P. ramosa* infection, in a heavily infested field, of two processing tomato cultivars, SV5197 and SV8840, belonging to the pear-shaped fruit and round-shaped fruit typology, respectively.
The trial was arranged according to a completely randomized design, with three replications, using the tomato cultivars treatments as plots of 60 m2 (6 m x10 m), each plot included three tomato twins rows (200 plants). The *P. ramosa* infestation was measured by counting the emerging shoots during the tomato growth cycle, at 45, 76 and 96 (harvest) days after transplanting (DAT) on three sampling areas of 4 m2 (along the central row) for each plot. Moreover, at tomato harvest the final number of parasite per host plant was counted and removed, and the numbers and dry weight of parasite shoots and tubercles were collected. The tomato fruits were harvested in the same sampling areas, at full-maturity stage, on 14 August 2018, when the productive quanti-qualitative data were collected.

## Results

As given in table 1, on all sampling dates (45, 76, and 96 DAT), significant higher emerged shoots in the cv SV 5197 than cv SV8840 were observed. At 96 DAT, a 65.1% reduction of emerging shoots in cv SV8840 compared to SV 5197 was measured.

The SV8840 cultivar gave a significantly higher yield than the SV5197 ones (Tab. 2). This could be due the lower infestation, as seen previously, although other factors, dependent to the two genotypes used in the experiment, may have been involved. Higher mean fruit weight and width, and lower length were shown from the SV8840 and round-shaped fruit respect to the SV5197 pear-shaped ones. Finally, dry matter, soluble solids content, pH, acidity and color index of fruit were not significantly different between the tested cultivars (Tab. 2).

Tab. 1 Mean values of emerged branches shoots of *Phelipanche ramosa* (no $m^{-2}$)

| Cultivar | DAT 45 | DAT 76 | DAT 96 (Harvest) |
|---|---|---|---|
| SV5197 | 1.8±0.8a | 14.6±9.7 a | 21.2±5.7 a |
| SV8840 | 0.1±0.1b | 1.9±0.8 b | 7.4±2.0 b |

Data are means ± standard deviations of 9 samples. Different letters on cumulative values of each DAT and in each column are differing significantly at P≤0.05 according to Tukey's test.

Tab. 2 Quanti-qualitative traits of the fruits of processing tomato cultivars

| Traits | Cultivar | |
|---|---|---|
| | SV5197 | SV8840 |
| Yield (t $ha^{-1}$) | 71.3±3.4 b | 78.9±2.9 a |
| Mean fruit weight(g) | 57.9±6.1 b | 72.6±5.9 a |
| Fruit length (cm) | 6.6±0.4 a | 5.51±0.3 b |
| Fruit Width (cm) | 3.9 ±0.2 b | 4.8±0.3 a |
| Dry matter (%) | 6.1±1.0 a | 6.2±0.8 a |
| Soluble solids (°Brix) | 5.3±1.0 a | 5.5±0.7 a |
| pH | 4.4 ±0.1 a | 4.3±0.1 a |
| Tiatrable (g citric acid 100 $ml^{-1}$ juice) | 0.30±0.1 a | 0.22±0.1 a |
| Color index( a/b) | 2.05±0.1 a | 2.00±0.1 a |

Data are means ± standard deviations. Data followed by different letters within rows are significantly different (P<0.05 according to Tukey's test).

## Conclusions

In view of the importance of processing tomato as the major cash crop for the farmer and the heavy losses in the field mainly due to *P. ramosa* in many Mediterranean agricultural areas, to select cultivar to this harmful weed control is very important. Under infested field conditions, the results obtained in this study show that agronomic strategies as resistant tomato cultivars are suitable to reduce the *P. ramosa* infestation.

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