ERADICATION OF *RALSTONIA SOLANACEARUM* FROM TOMATO GROWTH SUBSTRATE USING A SOLAR COLLECTOR

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INTRODUCTION

Bacterial wilt caused by *Ralstonia solanacearum* constitutes one of the most difficult diseases to control. The use of disinfested substrates is important for the production of disease-free seedlings and preventing the dissemination of this pathogen.

Equipment was developed at Embrapa Environment in Brazil, with the aim of disinfesting substrates using solar radiation. The solar collector was effective in controlling several fungal plant pathogens, including species of *Fusarium*, *Pythium*, *Rhizoctonia*, *Sclerotium*, *Sclerotinia*, *Phytophthora*, as well as nematodes such as *Meloydogyne* (1, 2), after the treatment of the substrate during only one sunny day.

The purpose of this work was to determine the efficacy of the solar collector for the control of the bacterial wilt caused by *R. solanacearum*.

MATERIALS AND METHODS

Description of the solar collector The solar collector comprises six aluminum tubes (15 cm diameter) placed in parallel in a wooden box (1.5 m x 1.0 m x 0.3 m), covered with a transparent plastic film (Fig. 1). The substrates are treated inside the tubes.

Experiment The experiment was conducted at Jaguariúna, SP (22°42'S, 46°59'W), during autumn. Soil substrate was mixed with a bacterial suspension (8×10^6 cfu.mL^{-1}), placed in the solar collector and treated for 1, 2, 3 and 4 sunny days. Controls with infested and non-infested substrates were kept at room temperature during the treatment. After that, tomato seedlings (cultivar Santa Clara) were transplanted to pots containing the substrates from the treatments and the controls (5 plants and 2 L of substrate per pot, with 8 replications). Visual determination of incidence of wilt symptoms and isolation from symptomatic plants were performed. Temperature of the substrate inside the solar collector was measured at intervals of one hour.

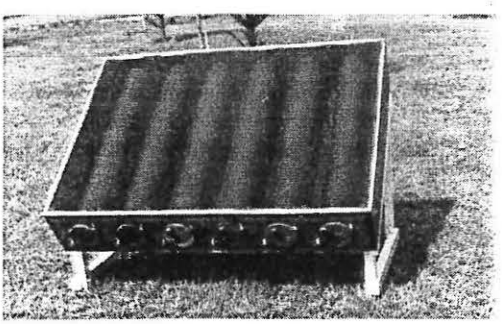

Figure 1 Solar collector for substrate disinfestation.

RESULTS

Temperatures of the substrate were higher than 60°C for at least 5 hours per day. Maximum temperature reached was 78.8°C.

The solar collector promoted eradication of *R. solanacearum* from soil substrate after one-day treatment under full sunlight (Table 1 and Fig. 2).

Table 4 Effect of solar collector treatment on the control of tomato bacterial wilt caused by *Ralstonia solanacearum* in substrate.

Treatments	Diseased plants (%)
Infested, untreated	60
Infested, 1 day treatment	0
Infested, 2 days treatment	0
Infested, 3 days treatment	0
Infested, 4 days treatment	0
Control not infested, untreated	0
Control not infested, treated (4 days)	0

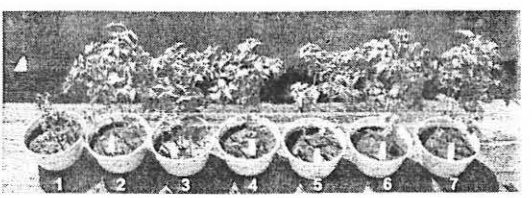

Figure 2 Tomato plants growing on substrate infested with *Ralstonia solanacearum* and not treated (1); treated for one (2), two (3), three (4), and four (5) days on solar collector; not infested and not treated (6); and not infested and treated on solar collector (7).

DISCUSSION

This study demonstrates that the solar collector is efficient, not only for the control of soilborne fungi and nematodes, but also for *Ralstonia solanacearum*. Many growers, nurseries and research institutions are using this equipment instead of methyl bromide in Brazil. It can be used during the entire year, over the whole country. The solar collector offers a low-cost, efficient, and safe system for the production of healthy seedlings, and is easy to construct and operate.

REFERENCES

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