



EcoFlora Nursery Trial in Tomato

Product: EcoFlora
Crop: Tomato

Trial setting: Nursery
Location: Cochabamba, Bolivia

Effect of EcoFlora in tomato (*Lycopesicon esculentum*) plant development and quality in the greenhouse

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The potential yield of tomato in the region oscillates between 30 to 45 tons ha^{-1} (CNPSH, 2001). However, the average yield currently obtained is between 26.7 and 30.4 tons ha^{-1} . The main causes of yield loss are mortalities caused by nematodes and the pathogenic fungi *Fusarium*, *Phytophthora* and *Rhizoctonia* (Nuez, 2001). The use of chemical pesticides helps control pathogens for a short time, but after the degradation of these compounds the pests and pathogen populations rebound, leading to root damage and mortality (Rosero, 2006). EcoFlora was evaluated as an alternative to chemical pesticides, to improve plant development and reduce plant mortalities.

Methods

The trial was carried out in a greenhouse from the National Center of Seed Production in Cochabamba, Bolivia. The substrate used was made from burnt rice hull, lime, peat moss, and coarse sand at a ratio of 1:1:1:0.5. Two thirds of the substrate were disinfected with water vapor (105 °C for 55 minutes), while the remaining one third was not treated.

Three treatments were evaluated.

- (a) EcoFlora was applied to the disinfected substrate and then every ten days. EcoFlora was applied to the foliage for a total of three foliar applications. EcoFlora was applied at a dose rate of 80 grams ha^{-1} application $^{-1}$. Treatment designation: + EcoFlora
- (b) Disinfected substrate. Treatment designation: - EcoFlora
- (c) Control with non disinfected substrate.

A randomized block experimental design was used with four replicates per treatment, each one of them with 4 trays of 100 cells; one seed was placed per cell for a total of 1,200 plants. All plants were watered three times a day.

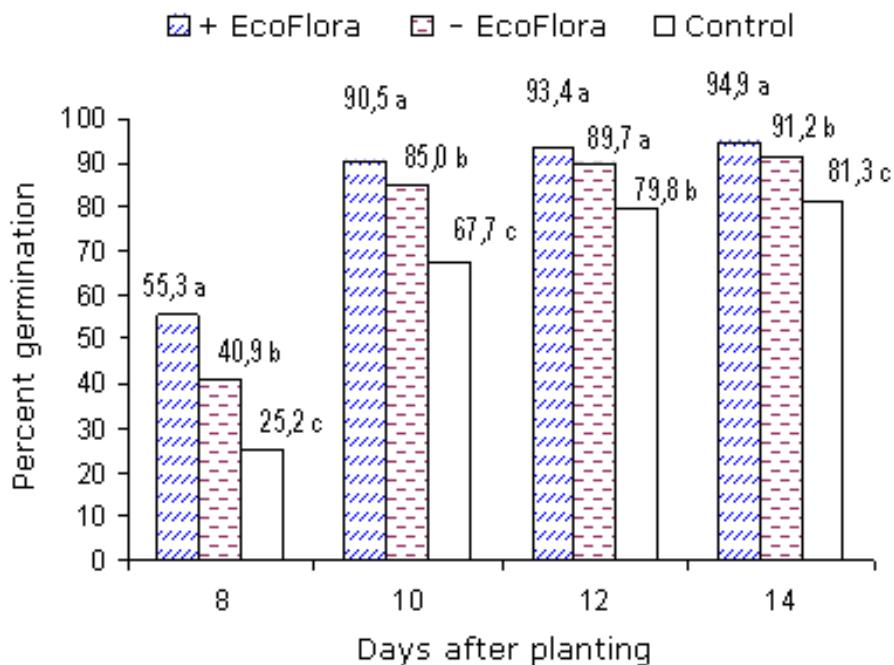
The following measurements were carried out: Plant emergence, plant height (cm), number of leafs, foliar, root and whole plant dry weight, and plant mortality during a period of 37 days after planting.

The data was analyzed by the randomized block design of Steel and Torrie (1992), and the comparison between treatments was carried out by the least significant difference test and the t-student distribution using the program SAS.

Results

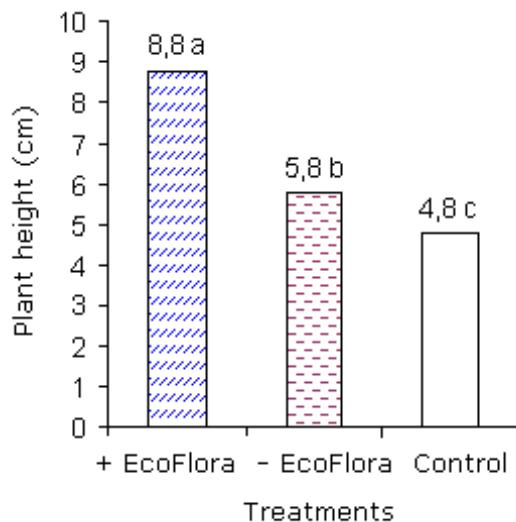
Plant emergence

There were significant differences ($P<0.05$) in plant emergence between the three treatments after 8, 10 and 14 days of planting. The best results were obtained under the EcoFlora treatment. No statistical difference was determined on day 12 after planting between the EcoFlora and the disinfected soil treatment. A 14% increase in germination rate was determined 14 days after planting under the EcoFlora treatment over the control treatment.



Plant height

Significant differences in plant height in cm ($p<0.05$) between the three treatments were determined at 31 days after planting. The differences increased by day 37 are shown in the following graph.



Plants grown under the EcoFlora treatment were 52% and 84% taller than the plants grown in disinfected soils and in the control treatment, respectively.

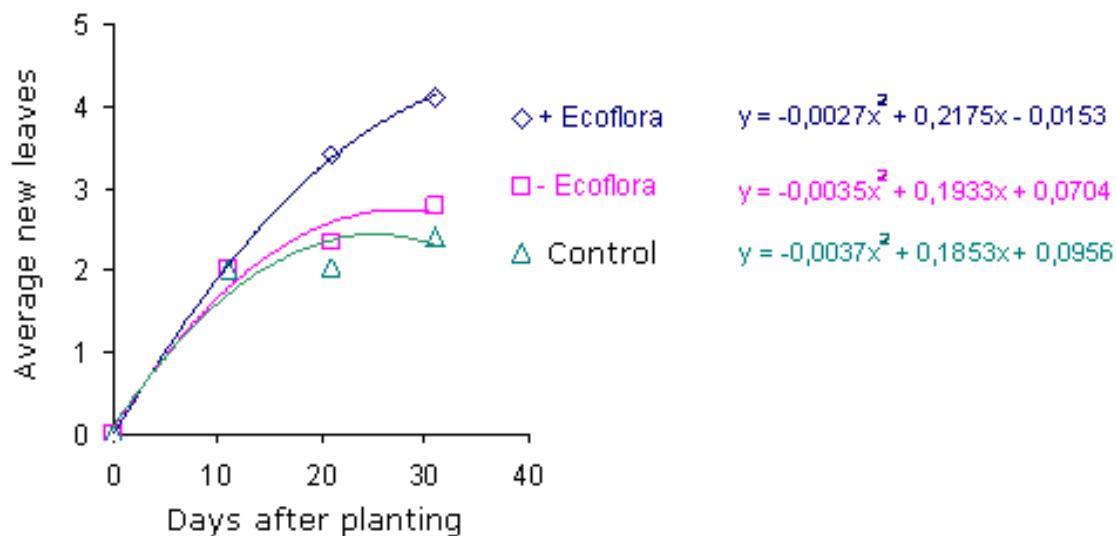
Plant dry weight

The dry weight of the roots, foliage and total plant were significantly larger in the EcoFlora treated plants than in either of the two other treatments. The results are presented in the following table. Values with a different letter in the same column are significantly different.

Treatment	n	Dry weight (g)					
		Foliar		Root	Whole plant		
EcoFlora	80	0.139	a	0.051	a	0.190	a
Disinfected	80	0.094	b	0.035	b	0.129	b
Control	80	0.060	c	0.022	c	0.082	c

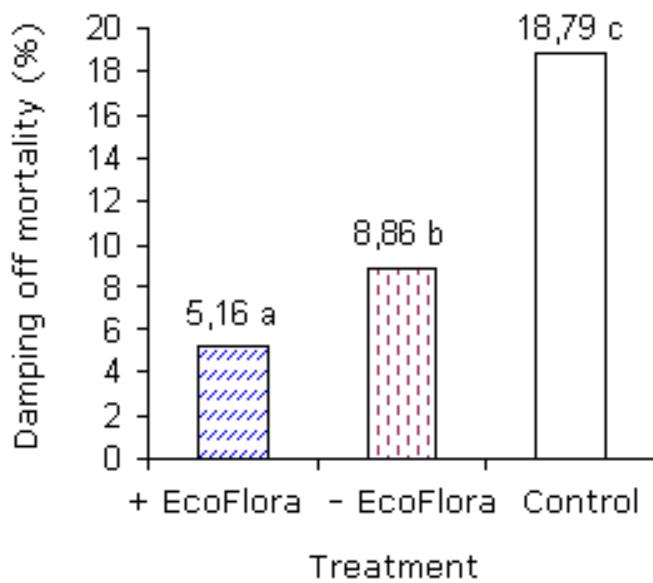
Significant differences in the number of leaves produced under the different treatments were determined after 31 and 37 days of planting. The average numbers of leaves produced under each treatment are presented in the following graph.

New leaf formation



Plant mortality

Plant mortalities were also significantly different among treatments ($P<0.05$) as shown in the following graph.



Plants grown with EcoFlora were overall of much better quality than those produced with just the disinfection process. EcoFlora improved all variables evaluated in this

research from germination, root and foliar development, leaf formation and reduction in plant mortality.

References

- CNPSH (Centro Nacional de producción de Semilla de Hortalizas). 2001. Presentación de Variedades. Villa Montenegro, Cochabamba. 24p.
- Nuez, F. 2001. El cultivo del tomate. Mundi – Prensa. México, D.F. 793 p
- Rosero, J. 2006. 2006. Factores Ecofisiológicos en el Desarrollo de Cultivos Agrícolas. Ecuador, Mundo Verde. 1 disco compacto.