

Title: FORMULATION OF *Bacillus subtilis* FOR THE CONTROL OF POSTBLOOM FRUIT DROP IN CITRUS, UNDER FIELD CONDITIONS

Autores Klein, M.N.¹, Silva, A.C.², Lopes, M.R.², Kupper, K.C.³

Instituições ¹UNESP - Universidade Estadual Paulista (Prof. Paulo Donato Castellane s/n, 14884-900 - Jaboticabal, SP), ²UFSCAR – Universidade Federal de São Carlos (Rod Anhanguera km 174, 13600-970 - Araras-SP), ³Centro de Citricultura “Sylvio Moreira”/IAC (Rod. Anhanguera km 158, 13490-970 Cordeirópolis-SP)

Abstract:

Postbloom Fruit Drop (PFD) caused by *Colletotrichum acutatum* Simmonds, is one of the most severe diseases of citrus, particularly when the rains coincide with the period of flowering. The disease is controlled with protectant and systemic fungicides sprays. Because of the undesirable consequences of these applications, it is necessary to study alternative control methods, eg. biological control. So, this study aimed to develop a formulation of bacteria *Bacillus subtilis* (ACB-69) using different carrier materials, with or without additives, for the control of PFD under field conditions. The experiment was done in plants 'Tahiti' acid lime (*Citrus latifolia*), with natural infestation of *C. acutatum*, located in Estiva Gerbi, São Paulo, Brazil, in the 2011/2012 season. The formulations of *B. subtilis* were stored for four months at room temperature, containing 1×10^{12} cells/g⁻¹, comprising: 1)Talc, 2)Talc+urea 0.02%, 3)Talc+ammonium molybdate 1 mM, 4)Potassium alginate, 5)Potassium alginate+urea 0.02%, 6)Potassium alginate+ammonium molybdate 1 mM, 7)Kaolin 8)Kaolin+urea 0.02% 9)Kaolin+ammonium molybdate 1 mM. In all formulations were added carboxymethylcellulose and bacterial broth. The bioproducts were applied in orchard once a week, with an air-assisted sprayer during the citrus flowering stages. As controls were used fungicide thiophanate methyl and untreated plants. The first evaluation was performed one week after the last spraying, by counting the number of symptomatic flowers of infection (orange–brown lesions on open petals), totaling 100 flowers in each of the three plants, calculating the percentage of symptomatic flowers. The second evaluation was 90 days after, calculating the number of fruit sets and the number of persistent calyces, typical symptoms caused by disease, to calculate the average number of effective fruits ANEF = $A/(A+B) \times 100$, A=n° fruit sets; B=n° persistent calyces. Results showed that formulation of *B. subtilis* using talc + urea (0.02%) resulted 72.7% of flowers without infection by the pathogen and 56.4% of ANEF. Untreated plants resulted in only 8.8% of healthy flowers and 0.83% of ANEF and treatment with fungicide showed 69.6% of healthy flowers and 46.7% of ANEF. Through these results we conclude that a bioproduct formulated from a strain of *B. subtilis* using talc as carrier material and urea as additive is effective in controlling the PFD in citrus, under field conditions.

Palavras-chaves: additives, bioproduct, biological control, carrier material, *Colletotrichum acutatum*.

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