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“Development on the margin”

Control of *Phytophthora palmivora* in Organic Cocoa in Southern Vietnam

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Abstract

Worldwide, *Phytophthora palmivora* is the most important disease of cocoa, causing yield losses of 30 to 90 %. Smallholders, who produce the largest share of cocoa worldwide, often face constraints regarding access to inputs. Botanical sprays or resistant cultivars could help smallholders, because they often do not imply cash expenditures. Therefore the Eco-Cocoa programme (supported by the Swiss NGO Helvetas) in southern Vietnam worked with garlic as botanical spray and tested 83 cocoa clones available at research station level for resistance to *Phytophthora palmivora*.

When pure garlic extract was mixed with carrot agar at concentrations of 0.2 and 0.5 %, no fungal growth at all was observed after inoculation with *P. palmivora*. When the garlic extract concentration in the medium was lower, the effect was weaker, but still significant. In a field trial, cocoa seedlings were first sprayed with garlic extract diluted in water to make a 0.2 % and 0.5 % solution. 36 hours later the seedlings were inoculated with *P. palmivora*. The effect was weak; the differences between the garlic treatments and the check were not significant. However, since the trial was set up in the dry season, development of the fungus was relatively slow.

Due to the encouraging laboratory results, it is suggested to repeat the experiment under conditions closer to the field reality and to test other forms of application like: 1) As a soil drench by spraying the solution on the soil under the cocoa tree to reduce the build-up of the fungal population in the soil; 2) “Spot spray” of a highly concentrated garlic solution on the pods; 3) Mixtures of garlic extract with other botanical agents like neem extract in order to increase the efficiency of the spray.

Of the 83 cocoa clones tested in the resistance trial, 41 clones were rated as highly susceptible, 26 clones were susceptible and 11 clones were moderately susceptible. Only 5 clones received the rating “moderately resistant” and none was rated as resistant. The statistical analysis showed that the test (performed on 15 pods per clone) was not sufficiently sensitive to discern reliably between different degrees of resistance.

Keywords: Cocoa, garlic, *Phytophthora*, resistance to disease