

Biocontrol and other alternative control methods against pre- and post-harvest pome fruit diseases

M. H. Jijakli

Gembloux Agro-Bio Tech, Université de Liège, Unité de Phytopathologie, Passage des
Déportés 2, BE-5030 Gembloux, Belgium
e-mail: mh.jijakli@ulg.ac.be

Abstract: Control measures against pome fruit diseases in orchard and in storage rooms are still principally based on the protection of leaves and fruits from pre- and post-harvest infection with pre- and postharvest fungicide treatments. However, in the context of consumer reluctance to chemical residues in food and public concern for environmental safety, there is an increasing demand to develop alternative methods to control diseases. That demand becomes a critical need with respect to the deregulation of effective and widely used fungicides, the development of fungicide-resistant strains of pathogens and the increasing demand of supermarkets for zero residue on pome fruits. For more than thirty years, public institute and private companies are researching and developing alternative methods such as biological control agents, chemical synthetic molecules approved for controlling diseases. However, compared to the number of classical synthetic molecules approved for controlling diseases of pome fruits, the number of alternative methods currently approved remains unimportant. Indeed, before becoming an economically feasible alternative to chemical control, alternative methods have to satisfy different requirements related to biological, technological and toxicological properties. The different steps for a successful strategy of disease control (selection, production and formulation, study of mechanisms of action, ecological characterization, monitoring, pilot efficacy trials, integration with other sanitary measures, registration) are all essential and complementary to the others. The lack of reproducibility and reliability of efficacy of such alternative methods when they are used in practice constitutes the major limiting factor. We will review these different steps of research taking examples of pre- and post-harvest diseases. Particular attention will be paid on biological control methods against post-harvest diseases as some commercial successes were recorded in that specific case.

Key words: biocontrol method, biological control agent, chemical with low impact, pome fruit diseases