



Exploring the economics of Biopesticides: State of the art and open issues

Abstract for poster submission

Biopesticides is a contraction of biological pesticides and defines certain types of pesticides derived from such natural materials as animals, plants, bacteria, and certain minerals. Biopesticides fall into three major classes: Microbial pesticides, Plant-Incorporated-Protectants and Biochemical pesticides. In 2014, more than 430 products were registered as biopesticide active ingredients and 1320 as active products. There is an increasing attention to the market of the Biopesticide. Reasons are related to the some advantages of biopesticides mainly concerning their low environmental impact. In fact, biopesticides are usually less toxic than conventional pesticides, affect only the target pest and closely related organisms, and often their decomposition is quicker, avoiding the pollution problems caused by conventional pesticides. However, there are several issues which are inherent to the nature of biopesticide. On the other hand, they usually require high technology and research to be developed.

The purpose of this paper is twofold. First we explore the state of the art with respect to the diffusion of biopesticides on the market and adoption by farmers. Second, we identify open problems for economic research related to biopesticides, with a focus on: a) incentives to development of biopesticides by industry and introduction on the market; b) adoption by farmers.

Some stages are identified in literature in the development of a biopesticide: the identification of opportunities for the development of biological control agents (the drivers), the discovery and genetic improvement of the organism (the science), the fermentation and formulation of the agent (the art) and the commercialization of the product (the business). In relation to the business stage the scientific literature highlights several issues in relation to dynamics involved in bringing the product on the market, which are in many case very different compared to those of conventional chemical products. Differences are pointed out in terms of identification of the market, model of commercialization, research network, patent and registration processes. In fact, biopesticide due to the combination of technologies and natural materials required to produce them are inherently innovative in the commercialization and registration process and attribution of patent. and the need for a mature market

Adoption at the farm level, besides profitability considerations, seem to be largely connected to the adoption/non adoption of more comprehensive technology strategies, such as organic farming .

Altogether, the economics of biopesticides shows to be a very promising field of study still largely unexplored by the literature.