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### ABSTRACT

## **Genetically Modified (GM) Corn in the Philippines: Ecological Impacts on Agroecosystems, Effects on the Economic Status and Farmers' Experiences**

by Dr Miladis M. Afidchao, Prof Dr Geert de Snoo<sup>1</sup> and Dr CJM Kees Musters<sup>2</sup>

To seek answers to the issues surrounding the introduction and nationwide adoption of GM corns in the Philippines, the research focused to find answers on the general question: *How can genetically modified corn and its attributed changes in agricultural practices affect the agro-ecosystem's biodiversity, the economic status, and social life of the farmers?*

On biodiversity, the GM corn effects were studied in a six-hectare field experiment in Cabagan, Isabela, during the 2009 dry and wet cropping seasons, in order to evaluate the short-term effect of GM corn (i.e. Bt and BtHT) on the community of in-field invertebrates. The findings showed that the total invertebrate abundance, surface dweller abundance, and species richness of surface dwellers, and soil dwellers were significantly higher in non GM cornfields than in Bt and BtHT cornfields.

Economically, data demonstrated that the existence of GM corn hybrids do not explicitly manifest economic advantage compared to non-GM corn hybrids. The analysis showed that corn borer occurrence, labor cost, seed cost, and fertilizer cost manifested the highly influential determinants for production output. The level of GM corn adoption proved to be influenced by the perceived economic advantage, extent of knowledge, level of satisfaction, and extent of first-hand experience of smallholders farmers.

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# Theme 3

## Food, Forests, and Farmers *Finding Sustainable Pathways for the Future*



Socially, farmers switched to GM corn due to their perceived yield increases, better insect control, reduced costs of inputs, and curiosity. Knowledge about GM corn and accessibility of GM corn seeds influenced its adoption. The high price of GM seeds formed a barrier for non GM farmers to switch to GM corn.

To conclude, the study highlights the advantage of non GM cornfields in terms of the abundance and species richness of all invertebrates and of the ecological guilds. Between the two GM corn varieties, GM Bt corn poses less of an environmental risk to invertebrate ecosystem populations than BtHT corn. The production output did not statistically differ between GM and iso-hybrid non GM corn. The GM corn adoption no longer directly gives economic advantage against non GM corn considering all the variables studied.

### About the Author

**Dr. Miladis M Afidchao** is a Professor 5 at the Isabela State University Cabagan Isabela and consortium director of the Cagayan Valley Agriculture, Aquatic, and Natural Resources Research and Development (CVAARRD). Dr. Afidchao completed her Master's degree in Biology at the Isabela State University, Echague, Isabela. She took additional MSc coursework at the Conservation Biology Department of Leiden University at The Netherlands where she also did her PhD research.