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**“An Exploration of the Potential Benefits of the Adoption of
Insect Resistant Potatoes and Integrated Pest Management
Practices in Ventaquemada, Colombia”**

Topic:

Biotechnology & developing countries

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ABSTRACT

IFPRI and CORPOICA are jointly implementing a project whose goal is to address the question of what are the potential benefits of the insect resistant (*Bt*) potatoes and Integrated Pest Management (IPM) practices to address the increasingly important problem of the Guatemalan Tuber Moth (*Tecia solanivora (polvony)*). This research attempts to document the opportunity cost of not deploying the *Bt* potato in the well-defined context of potato production in Ventaquemada, Colombia. We explore a simple expectations model and traditional economic surplus model to outline the likely potential range of gross and net benefits that may be accrued by farmers in the region due to the potential adoption of *Bt* potatoes and a suite of IPM management practices.

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Tecia is particularly destructive because field spraying on the adult stage (the strongest link in the life cycle) is ineffective and has already resulted in resistance to several insecticides. Moreover, classical biological control of this new pest is unlikely to work because of the excessive use of insecticides and the high specificity of damage to the tubers. Insect resistant (*Bt*) potatoes has been shown to be an effective means to control other species of the tuber moth complex which is the most globally distributed pest of potato in other countries. Thus the prospects are bright that the *Bt* potato can play a role in solving the increasingly relevant problem of Tecia in Colombia.

In this paper we present the preliminary results of the ongoing project which includes cost and price determinations through farmer surveys and focus groups, IPM management practices verification, estimation of the damage loss due to Tecia, farmer field school and its demonstrative plots, and continued extension and knowledge transfer activities. In addition, we provide initial estimate of the economic cost and benefits of conventional, IPM managed and *Bt* potato management practices.

Studies attempting to analyze the impact of IPM practices and *Bt* potato Technologies have to address three important issues: 1) Selective adoption of components of the portfolio of IPM practices, 2) Pest management is directly affected by plant environment interactions and farmer management, thus benefits may come from reduction in the use of pesticides and decreased production and 3) the stochastic nature of the Tuber Moth attack, which is highly dependent on precipitation. Our preliminary results indicate that damage during harvest periods between December 2003-March 2004 (Planted 2nd semester 2003) and from June-September 2004 (Planted 1st semester 2004), were low. Varying from 0.75%-2.43% of total yield. The low level of damage by the Tuber Moth was significantly explained by sustained precipitation during the year. This caused that there was no difference between conventional and IPM management under these situations or even a negative return on IPM practices due to increased labor costs. However, Baquero *et al* collected data in Colombia to document the damage by the Tuber Moth from farmers. Yield losses can be as high as 75% whereas storage losses can be as high as 78% and thus open the possibility of the need for exploring alternatives such as insect resistant potatoes and other technologies to address the problem.