Extension of Integrated Pest Management Methods for Nicaraguan Bean Producers: Effects on Adoption, Profitability, Farmer Health and Beneficial Insects.

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Introduction

Bean growers in Central America face important insect pests and diseases, including whitefly, bean pod weevil, web slight, angular leaf spot, and many others. In order to avoid yield losses, farmers rely mainly on chemical pest control. However, the use of pesticides has also caused harm to farmer health and the environment. Integrated Pest Management (IPM) has been proposed as an alternative pest control method that seeks to reduce pesticide use and attendant risks to human health and the environment. Despite many efforts at IPM dissemination in the region, its adoption has been low. Farmer Field Schools (FFS) have been introduced in Nicaragua as an alternative extension program aimed at increasing the adoption of IPM.

Farmer Field Schools

In 2001 with assistance from the Zamorano University and Swiss Development Cooperation IPM program, several institutions introduced FFS. Participant farmers have been "learning by doing" the biology of bean pests and diseases, alternative pest control methods in order to reduce environmental and health risk while maintaining profits.

Research objectives

- Evaluate whether IPM FFS have 1) reduced pesticide risk to human health and beneficial insects, and 2) Induced greater adoption of non-chemical pest control.
- Determine whether individual characteristics of the institutions implementing FFS influence the delivery of IPM.

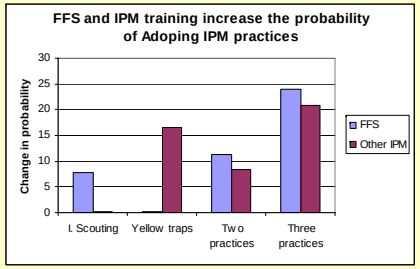
Methodology

In 2004 we surveyed 436 Nicaraguan bean growers. The clustered random sample was stratified by 4 levels of exposure to IPM training: FFS, same village as FFS graduates, other IPM training, and no IPM training

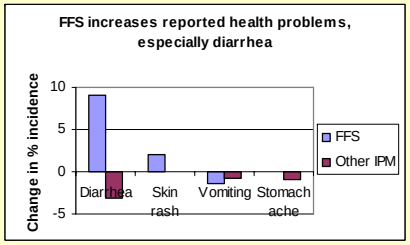
We estimated econometric models of household demand for pesticides, IPM non-chemical practices, health and beneficial insects.

Selected Results

- FFS have no significant effect on bean growers demand of pesticides
- FFS have a positive and significant effect on IPM non-chemical practices adoption.



- FFS have not produced the expected health benefits but has increased the level of beneficial insects. Other IPM delivery methods performed better in health outcomes.



- FFS impacts vary by implementing agency. Institutions with more extension agents trained in IPM and more extension agents per district reduced farmer use of herbicides and fungicides and increased the probability of adopting botanical insecticides.

Conclusions

- FFS did not influence pesticide use among Nicaraguan bean growers, but have increased the adoption of IPM non-chemical practices. Farmers still rely mainly on chemical control but complement it with non-chemical inputs
- Part of the failure of FFS is due to the diversity of implementing institutions. Some are more effective than others.

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