



Tropentag, September 19-21, 2012, Göttingen -  
Kassel/Witzenhausen

“Resilience of agricultural systems against crises”

## Agricultural Practices and Possibilities for IPM and Sustainable Resource Management in the Mojanda Watershed, Ecuador

LUKAS SCHÜTZ, STEFAN VIDAL

*Georg-August-Universität-Göttingen, Dept. of Crop Sciences: Entomological Section, Germany*

### Abstract

Agriculture in the Mojanda Watershed is facing rainfall reductions caused by climate change. Reductions of water availability in the Watershed are also due to constant extension of the agricultural activities into the páramo ecosystem above 3000 m asl, with this ecosystem having immanently important functions in the local water balance. The application of pesticides threatens the quality of water and with less precipitation contaminations will further concentrate in the outflow. To analyse problems associated with agricultural practices in the area a questionnaire about agricultural practices (28) was conducted and fields (20) were surveyed for pests and diseases with a focus on potatoes (*Solanum tuberosum* L.), tree tomatoes (*Solanum betaceum* Cav.) and peas (*Pisum sativum* L.). Potatoes were infected to a low degree with *Phytophthora infestans* and according to the farmers the Andean potato weevil (*Premnotrypes* spec.) caused biggest losses. To combat the weevil the soils are disinfected with toxic Carbofuran (WHO Class 1B). Tree tomatoes showed symptoms of various fungal diseases. Most important was *Fusarium solani* causing the branches to rot and Anthracnosis (*Colletotrichum gloeosporioides*) causing the fruits to rot. Fungicide applications were correspondingly high. Peas were only minorly affected by Ascochyta blight (*Mycosphaerella pinodes*) and a root rot. Overall 19 active ingredients were applied of which fungicide Mancozeb (WHO class table 5) and insecticide Carbofuran (WHO Class 1B) were applied the most. Common IPM methods are advised to reduce pesticide use. For tree tomatoes regular cutting of branches infected with *F. solani* and regular collection and disposal of infected fruits with Anthracnosis are advised. For potatoes plastic barriers around the fields prevent the Andean potato weevil from laying eggs thus reducing infestation with the larvae in the tubers. Local bioinsecticide “BioI” seems effective and without harm to the environment, although not used by many farmers. Organic fertilisation promises to restore decreasing soil fertility and reduce erosion. The newly established extension service programs of the Ecuadorian Government, “Schools of the Agrarian Revolution” (ERA) are aimed at reaching smallholders and reducing poverty, and should consider IPM methods for improving agricultural practices to solve local environmental problems.

**Keywords:** Ecuador, IPM, maize, Mojanda watershed, pea, pesticide use, potato