Photo: International Potato Center.

13. Production of Organic Potatoes in the Andean Region of Peru: The Enabling Role of Integrated Pest Management

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The potato is one of the main crops for food and economic security of vast populations in the world and especially in the Andean highlands. The crop suffers severe damage from the Andean potato weevil and the potato moth. The former is found at elevations greater than 3,800 meters above sea level and includes 12 species of the genus *Premnotrypes*, which can cause losses of between 16% and 45%, even with the application of insecticides. If the pest is not systematically controlled, the reduction in the yield and quality of the tubers may amount to as much as 80-100%. As a consequence, the farmers are being forced to abandon their lots. At lower altitudes in the Andean valleys, potato moths *(Phthorimaea operculella, Symmetrischema tangolias)* can cause losses of up to US$500/hectare per year. Insecticides are normally used to control these pests, but they can be extremely harmful to both humans and the environment.

The International Potato Center (CIP), in collaboration with its partners (national institutions, NGOs, and rural communities), has developed and validated alternatives of integrated pest management (IPM), which have proven to be highly effective from a biological, economic and environmental standpoint.

Three recent innovations enable the control of the Andean potato weevil in particular and two species of the potato tuber moth, either using considerably lower quantities of insecticide or without any at all. The innovations are:

1. Physical barriers that prevent the migration of the Andean potato weevil to potato plots. This new technology is the only ecological method that effectively controls pest infestations. It reduces damage by up to 100% without the use of insecticides.
2. Two attracticides: AdiosMacho-Po and AdiosMacho-St, which control the species *P. operculella* and *S. tangolias* of the potato moth in both the field and storage.
3. A formula and product of talcum-Bacillus thuringiensis subesp. kurstaki (Btk) which protects the potatoes in storage from *P. operculella and S. tangolias.*

The three technological innovations were founded upon the main pillars of a new IPM potato program and were validated on a large scale.

The technology of plastic barriers is very easy to use and has been fundamental to obtaining certification of the organic production of native potatoes in the department of Huancavelica. Its use has reduced total damage to the tubers by the weevil from greater than 80% to approximately only 5%.

Farmers belonging to the Association of Agriculture Producers for Andean Industry- AGROPIA, located in Pazos and Huaribamba, produce certified organic native potatoes with colored pulp. Blue and red potatoes are processed into flakes for the international markets, mainly France and Belgium, with the support of the NGOs CEDINCO and AVSF-CICDA. In the communities of Mariscal Cáceres in Conayca and Chilhuapampa in Palca, Huancavelica, 20 families members of the ALLPARURUCHIQ association produce potatoes for the national market, and have organic certification for Europe and the United States.

Nearly 800 families participating in a Caritas project are registered as beneficiaries and are already receiving training in IPM based on the technologies developed by CIP and its partners.

In the local markets, native potatoes produced conventionally have low market prices and returns for the farmers are between US$0.15 and US$0.20/kg. However, the implementation of the new IPM technologies enables organic certification and value added through the processing of the native colored potatoes into potato flakes. The innovations allow farmers access to new national and international markets where they sell their products with higher returns of up to US$1.10/kg.