Stolen Harvest in Pocona

Plant Health Services | **Bolivia** |

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Case histories on the successes and challenges of agricultural development

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WILGE VELASCO IS AN AGRONOMIST, tall and thin with a serious, almost melancholy air. Wilge walked us up a gentle slope and knelt in a sandy, red field where the Rojas family had cut off the potato tops to feed to their cattle. The tubers were bulging out of the earth, not because it was going to be an abundant harvest but because the tubers had a disease which made them grow unusually close to the surface. They were also purple and greasy-looking, instead of their normal red and cream colour.

Wilge (below) was giving us a tour of the pests and diseases of the isolated community of Tumuyu B, where he lives Tuesday through Friday, working on a project with ATICA, in the municipality of Pocona. So as he showed us the disease, he said matter-of-factly, "this is *Rhizoctonia*."

Everybody who works with potatoes in Bolivia thinks this disease is caused by this fungus. But it's not, as we pointed out to Wilge, explaining that Phil Jones of the GLOBAL PLANT CLINIC, and Rothamsted Research, recently diagnosed the disease as a phytoplasma. This is a completely different type of organism to a fungus, with its own unique biology and ecology that requires different control measures.

Because the disease is newly identified in Bolivia there is a lot to learn about it. For example, we know that it is found from Cochabamba to the valleys of Santa Cruz, but we need to know more about its distribution and level of damage. We also need to know things like the common names, and farmers' perceptions of it.

Wilge said that in Quechua, farmers call it *phurmu*, meaning "overflow". A few moments later we met the local *dirigente*, Justo Rojas, who was harvesting broad beans nearby. He said they also call it *qherqe*, (meaning "greasy or oily," a good name, given the symptomatic sheen on the potato skin). Mr. Rojas, who is in his early 30s, said that it was a new disease, one they hadn't known as children. He added that they do not do anything special when they notice the disease. And he surprised us a little by saying that *qherqe* does not lower production.

Called phurmu *or* qherqe *in parts of Bolivia. In Mexico this disease is known as* punta morada *('purple tip.')*

That has to be taken into context. ATICA agronomist Bernardino Soliz explained that when ATICA helped the communities of Pocona document their demands, the people of Tumuyu B said their problem was **low soil fertility**. Their main crop, potato, was yielding poorly. Bernardino explained that the campesinos applied large amounts of chemical fertilizer, but harvests still remained low. PROLADE, an institution based in Cochabamba, won the contract to help solve Tumuyu's soil problems, and hired Wilge to do it. But the first time Wilge helped farmers harvest the *mishka* (early season potatoes) in November of 2002, he saw the typical galls of root knot nematodes (*Nacobbus aberrans*). He performed the simple "glass test" (which requires only a drinking glass and a piece of newspaper) and found the tell-tale cysts of nematodes (*Globodera*).

Wilge told the local farmers that their problems were nematodes, not low soil fertility. They didn't believe him. They looked at the tiny black cysts, which look like the seeds of certain common weeds (especially *Spergula arvensis*). "Those could be the seeds of some herb," they said.

Because ATICA had thoughtfully included funds for community members to travel, Wilge took the villagers to the PROINPA experimental station at Toralapa, where they

saw the tiny nematodes and learnt that each cyst contained over 50 eggs. The farmers were impressed, and more importantly, were convinced that nematodes were the real cause of their problem.

It is a lucky community that has a resident agronomist, especially one who speaks Quechua and has a lot of previous experience with plant pathology. Wilge began the diagnostic investigation, piecing together the story and weighing the evidence: soil fertility was not especially low, but there may have been problems with too much chemical fertilization, so he began doing simple field trials with broad beans as green manure. Besides noticing the nematodes, he saw that late blight (*Phytophthora infestans*) was a common fungus disease in potatoes, and he explained to the people that if they alternated systemic and contact fungicides they could control the disease better with fewer applications.

Gladys Main of PROINPA *demonstrates the glass test and the tiny nematode cysts*

There were other problems. Community leader Soylo Yarhui asked us what they could do about weevils in maize. "When we were kids, we saved our own maize and planted it again. Now we have to sell it all and buy new maize for seed. Within a month these bugs ruin the maize until its only fit to feed to the pigs."

We went to see Erminio Sutiya, who stopped winnowing his wheat long enough to show us some weevils. Like Soylo, don Erminio also called the weevils *jak'u*, which in Quechua means "flour". Sadly enough, it is an appropriate name, because the weevils grind the maize into a filthy flour that no one can eat. They also showed us their potatoes, which they had covered in lime to try to remove some of the moth larvae tunnelling through the harvested potatoes.

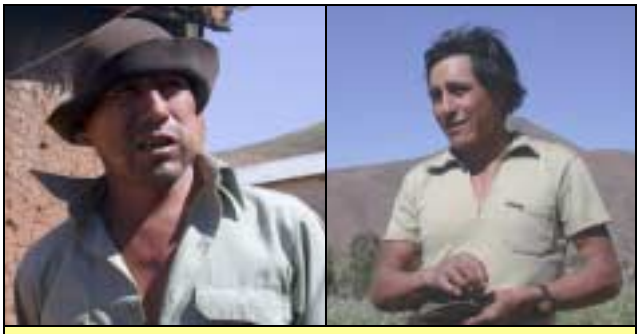
Doña Gregoria shows us the maize weevil

Although the maize weevil is a new problem, don Erminio and his wife Gregoria have observed a lot about them. The couple explained that there were several kinds, some with snouts, some without, and that they were similar, but different to the kinds of weevils found in wheat. All this is scientifically correct: the ones with snouts are true weevils in the family known as Curculionidae, while the others are beetles from other families with similar ecologies.

And there are many species, attacking different grains. They got us an ear of maize from their store, and it was crawling with weevils. With the frustration that comes from watching helplessly as insects eat their kids' food, the couple insisted "What can we do about this?"

We thought of metal grain bins developed by a Swiss (SDC) funded postharvest project in Central America and how this successful option could help don Erminio and his neighbours, if they were available and affordable.

Besides the nematodes, phytoplasma, weevils, tuber moths and late blight in Tumuyu, there are other problems we haven't mentioned here: the potatoes probably also have viruses. The onions have mite damage and an undiagnosed fungus disease that blights the plants. Broad beans have yellowing symptoms that also suggest a virus, brown leafspot and leafminers rotting the insides of stems. Peaches have sun-damage, rust fungus, leaf curl and serious wood-boring beetles. The apples are so loaded with epiphytes (probably *Eryngium paniculatum*) that they hardly yield fruit.



Erminio Sutiya and Justo Rojas help us to understand the plant health problems they face and how we can find solutions

Whatever the condition of the soil is in Tumuya, pests and diseases are robbing much of the harvest that the land does provide. Once again, it's a lucky community that has a full-time agronomist.

More information

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June 2003