

Starting a Plant Health Clinic in the Organized Chaos of a Bolivian Farm Fair



report and photos by

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CABI Bioscience

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PLANT HEALTH SERVICES INITIATIVE FOR BOLIVIA

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Dr Bentley wishes to thank the following colleagues who worked together to successfully start the POSTA PARA PLANTAS in Tiraque. In alphabetical order of first name:

DANIEL VASQUES, Ing. Agr., Sucre

ERNESTO MONTELLANO, Ing. Agr., CIAT Bolivia

JAIME HERBAS, Ing. Agr., PROINPA Foundation

JAVIER FRANCO, Ph.D., PROINPA Foundation

MARTIN FISCHLER, Ph.D., ATICA, Inter-Cooperation

RENÉ PEREIRA, Ing. Agr., PROINPA Foundation

And the Honourable Municipal Government of Tiraque

In a nutshell

There is much talk about connecting with farmers and finding out how they can be helped and assisted, in order to succeed in agriculture. Plant health problems are a constant concern and persistent source of worry. The POSTAS PARA PLANTAS [PpP] concept is to create a regular meeting place for those seeking technical advice and support and those able to give it.

This short account describes how a PpP has been set up in Tiraque, a small town in Bolivia close to the city of Cochabamba, where PROINPA has its headquarters. They have a research station just up the road from Tiraque, at a place called Toralapa. These are the institutional building blocks that will support the weekly PpP in Tiraque.

The following report describes a short training event held in Toralapa and the initial experiences of running the very first PpP.

Good ideas take some time to settle down and to find their rightful place in an exciting attempt to create a new point of entry and contact between technical staff and farmers.

Behind the scenes CABI *Bioscience* is helping to nurture this new venture but its success depends crucially on the skills and experience of PROINPA staff and the willingness of the local municipality to fully adopt and embrace the PpP idea. In Comarapa CIAT Santa Cruz are carrying out similar activities though not yet under the PpP label. The LADIPLANTAS laboratory will be the subject of a separate report, showing how such facilities support farmers locally.

Daniel Vasques has been asked to develop PPPs in Chuquisaca and we look forward to reporting on progress in helping farmers manage the routine pest and disease problems that undermine efforts to achieve safe and certain production of crops. PPPs are only one way of doing this but we believe they are an important innovation that brings responsive science to where it is most needed – quickly, cheaply and effectively.

Some further viewing

- www.globalplantclinic.org
- www.proinpa.org
- www.ciat.bo.org/index.htm
- www.livelihoods.org
- www.dfid.gov.uk

DAY ONE – COCHABAMBA TO TORALAPA – 11 SEPTEMBER 2003

Getting Ready

Daniel Vasques and I met Javier Franco at the PROINPA headquarters in Quillacollo, where a few weeks ago they had to give up their top floor to another agency. They were now a little more crowded, but still smiling. Javier was soon chatting with Daniel like old friends. Daniel was amazed to learn that PROINPA had a bio-insecticide that worked for the potato tuber moth, which is ravaging central Bolivia. Javier, his office mate Oscar Barea and extension expert Jaime Herbas explained how it worked, and then Daniel said matter-of-factly that he was going to sell it.

While Javier talked he skimmed a technical paper on the computer screen and dealt with a stream of people coming in for one thing or another. One of them was Patty Meneses, the media person. She said Javier had to meet with the people from the newspaper who were coming out to talk about the disease in China berry trees. Javier told her that Toni (Dr. Antonio Gandarillas—director of PROINPA) would have to do it, because he, Javier, was going to Toralapa for our seminar on *Postas para Plantas*.

We drove for an hour and a half into the countryside, talking most of the way about biotechnology, the agrarian reform and other serious topics. We got to the Experimental Station at Toralapa in a happy mood. René Pereira (head of station) was there, although few other people were. René showed us our rooms and we had tea and went to the auditorium to set up the desks and the computer.

We went back to the cafeteria for lunch. Martin Fischler (of Inter-Cooperation, advisor to ATICA) got there at 12:30, right on time. Just as we were finishing our lunch, a relaxed and friendly Ernesto Montellano (CIAT) drove up from Comarapa. But we were disappointed that the people from the mayor's office of Tiraque did not come. René told us that he had called them several times, including the day before to remind them of our seminar today. René and I had met the mayor two weeks earlier, and he had agreed warmly to sending people to our seminar, and to support the *Posta para Plantas* in Tiraque.

René called the mayor's office on his cell phone, and kept getting different stories. They're on their way. No, they've been called to an important meeting in Cochabamba. We finally admitted that no one was coming from the mayor's office. The guests of honour had skipped their own party.

"We'll do it anyway," one of the guys said.

"Of course we will," another one said.

I was a little concerned about what Martin would say. He's worked a lot with *municipios*. "Eso es el pan de todos los días con los *municipios*¹," he said. In other words, they do this all the time. Somewhat relieved to hear this, we went into the very cold auditorium. I was probably the only one that knew everyone, so we all introduced ourselves.

¹ "This is the daily bread of working with municipal governments."

DAY ONE – AT TORALAPA
Preparing for the Posta

Three of us gave short talks about the background to this initiative.

1. Summary of presentation by Jeffery Bentley

Postas para Plantas is an initiative by CABI *Bioscience*, PROINPA, CIAT and municipal governments to provide diagnosis and technical assistance for crop health problems to farmers. Background experiences include GOING PUBLIC (GP) and LADIPLANTAS. Juan Almanza led the first successful GP at the fair in Tiraque in December 2001, with exercises on nematodes in potatoes. Daniel Vasques led another the following week on pests and diseases of peach in Sucre, and soon after in Tarabuco. Juan Vallejos, Magaly Salazar and Rudy Torrez (all of PROINPA) also had experiences with GP, as did Steve Eguino and colleagues at CIAT in Comarapa. Paul Van Mele went public in Bangladesh, and so did Eric Boa in Vietnam and Indonesia.

LADIPLANTAS in Comarapa started as a diagnostic lab for the MIP Papa project, with John Bridge and colleagues at CABI and CIAT. LADIPLANTAS quickly evolved into a service for giving farmers diagnosis. Farmers drop off samples and pick up the results during the week and on Sundays, during the weekly Comarapa fair. LADIPLANTAS gives farmers technical recommendations and CIAT researches integrated disease management, with farmers.

In Tiraque now, the next steps will be:

1. Go to the fair every Friday
2. GOING PUBLIC
3. Have technical flyers
4. Collect samples from farmers and diagnose the samples for health problems
5. Keep a record of these
6. Find out the meaning for the farmer of the pests and diseases
7. Develop technical recommendations.

I talked about the “chain” (originally suggested by Javier Franco) of municipality as the first link, which will send samples it cannot identify to Toralapa, which will send ones it cannot diagnose to Quillacollo, and on to CABI. It should be almost as useful as having the CABI plant pathologist with you in the field.

I gave the example of how originally we did not understand the meaning of **musuru**, but learning about it eventually led Daniel Vasques (with Jeff Bentley and Eric Boa) to develop the recommendation of a low-toxicity insecticide powder sprinkled in a ring of wool tied around the trunk of a fruit tree. It keeps ants from tending aphids, and so prevents aphid damage.

Farmers working in San Isidro, near Comarapa.

They are able to take diseased plants to CIAT's plant clinic (LADIPLANTAS) for diagnosis.



2. Summary of presentation by Ernesto Montellano, Ciat/Comarapa

LADIPLANTAS was started by CABI, PROINPA and CIAT. Phil Jones and John Bridge trained us. We started on the 27th of April, 2000 to analyze problems of 56 farmers in the MIP Papa project. Then we decided to involve more farmers, and to start working Sundays, when Comarapa has its fair, and by the end of 2002 we had analyzed 1036 samples, about three a day. We get a sample at 10 in the morning and often by noon we have the results, so the farmer can go buy a product to take home with him. In Saipina, we analyze seed potatoes. We take samples of the sacks on the trucks and that same day we have the results for nematodes and other problems and in three or four days we have the results of the ELISA test for bacterial wilt.

The first year we sampled seed that 121 farmers had bought. At 1200 tubers per farmer, the first year the municipality had to buy that seed from the farmers, but we charged the farmers for the ELISA test. CIP and Julian Smith of CABI helped us with that test. (Now farmers donate the seed for the test, because they have more confidence in it).

These communities have some pagan traditions, in that each one of the 41 communities around Comarapa has invented a saint for itself, Saint Noodle (San Fideo) and so on. Each year each of them has a Fiesta for Saint Noodle, which includes a mass and drinks. In two years we have gone to 78 of these town fiestas, and have talked about the lab and plant diseases, and have cultivated good relations. Four of our former thesis students now work in the mayor's office in Comarapa and Saipina, which also helps us to have good relations, and helps us to promote activities.

We are now identifying tomato samples for the Fundación Valles. Between Phil, John and Julian someone is going to England almost every month, so we can send samples to CABI frequently. We are also analysing samples of citrus for the Chapare.

If a farmer brings in a potato leaf with *Alternaria*, we give him a note telling him what it is, with a recommendation. We have him sign it and we charge him one boliviano. Then if the shopkeeper calls and says "we don't have the product you recommended" we can recommend another one. We have charged up to \$1500 for larger, more complicated jobs for bigger clients. So everyone doesn't pay the same price, but giving handouts (*asistencialismo*) must die. We tell farmers, 'your potato is no good for seed. If you plant this, it's your own responsibility.

'Doña (So-and-So), a large seed dealer in Saipina, said we were up to no good (*haciendo macanas*). But Olivia keeps macerated samples of the potatoes we run for bacterial wilt, so she said, 'here' and she ran it again, and it came out positive again. We tell farmers 'the seed from doña (another seed dealer's) has this, this and that. PROINPA's² seed has this and that.' They say 'but her seed is cheaper'. We say 'yes, because it's more diseased'.

Ernesto's comments set the rest of us thinking and wanting to know more.:

JAVIER: So how did you end up with doña (the first seed dealer)?

ERNESTO: With a bitter taste in our mouths, because she came to scream at us (*putearnos*) in a meeting one Sunday in Vinto (Cochabamba—where some people buy potatoes from highland Cochabamba). She said 'I'm going to bring some seed that I'm going to sell, so you can test it.' And I said 'No, because you'll just bring me some seed from SEPA. I'm going to go to your warehouse to test potatoes, so you don't go on cheating farmers.'

Anyway, we have a *convenio* with the municipalities. We don't want to cage ourselves into a *convenio*.

JAVIER: What do you think about what Jeff said?

² He may have meant SEPA, an agency that sells certified seed potato.

ERNESTO. We have to do it. Postas can be adapted very well to our needs. With Postas, we don't say who will participate. A person may be standing on the corner at first, and two meetings later be right up front with us. But your mayor should have been here today.

MARTIN: We know that it is not easy to get municipalities to commit. But the *convenio* is important. And people should know that you are at the fair.

ERNESTO: That's why in Saipina we asked for a room in the municipal office, and put a microscope there. You must have a *convenio* with the municipality.

DANIEL: That's fine in your case, because you have an institution. In Chuquisaca most of them have disappeared. Now if ATICA set up something like this in Redención Pampa, you could manage this with the municipality.



3. Summary of presentation by Javier Franco

With Postas para Plantas, our first objective is Tiraque. It's important for PROINPA to have a positive image with the farmers, but in the future, we could also include El Puento.

Diagnosis and recommendations go through a chain from the municipality through Toralapa, and from there to Cochabamba, which has a lab accredited by SENASAG, but only once has a farmer ever gone to that lab; he was a peach grower from Valle Alto. We must make material for the fair, so that farmers know that PROINPA supports them, and CABI. And eventually, with the support of ATICA, we could cover all of Cochabamba.

We must have a good data base, not just of potato. We must make a data bank and on the basis of that make flyers. We can use the samples we collect to make crop museums, of the pests.

PROINPA cannot offer a free service. But we will at first, in Tiraque, because it is in our best interest.

MARTIN: One thing is to sell services. Another would be to set up a project and seek funding.

RENÉ: Almost all of the municipal governments are lacking an agronomist. The local governments want projects, but they don't want to hear about them if they are not going to get (money) out of them.

DANIEL: You must talk to the comité de vigilancia in each municipality, to make sure that they include this project in their plan next year.

The team also discussed hiring farmer promoters, as an alternative to working with the municipality. The project can hire them, train them for three or four months, and send them to fairs to GO PUBLIC, draw a crowd and collect samples. It would be a lot less expensive than sending project agronomists to each fair, and much more under our control than working with municipal governments.

Discussion AFTER THE presentations, and in light of the embarrassing no-show by the Tiraque municipal government, we talked mostly about how to get the municipalities to actually participate. We reached a consensus that they had to sign a *convenio*. Some guys said that the municipalities would not participate on a project unless they got money out of it.

Just keep on going WHEN JAVIER couldn't stand the cold any longer he herded us back to the dining room, with its large windows for catching the bright, cold sun. While we warmed up with tea, Javier talked about not getting discouraged about Tiraque. "Eric's not thinking just of Tiraque, but of Bolivia, and Bangladesh and Uganda" he said, encouragingly. "We have to do Tiraque anyway, and we will; then we'll expand to all over Cochabamba."

Getting ready THEN WE planned our three exercises. There was surprisingly little discussion about this. We agreed to it unanimously, almost as soon as Javier suggested the topics. We went back to the auditorium to set up some samples of seed to show to people tomorrow, and got out a bucket to do the nematode glass-&-paper test.

René quickly assembled some plastic trays with some healthy seed and some disease wracked potatoes, along with the weird purple tubers growing on stalks, far above the ground. He wants to send them to Eric because he doesn't believe it's a phytoplasma. "Some potatoes always grow like this," he said. "Even if you plant them in the greenhouse in the winter." Javier had brought out four or five Nescafe jars, filled with solution, with more potatoes in them, also with advanced disease symptoms.

Sociolinguistics I SUGGESTED we make a sign, which everyone agreed was a good idea. René produced a piece of light cardboard. Javier and I batted a few ideas back-&-forth, whether to write 'Do you know good seed?' or 'Get to know good seed! Until we finally realized we didn't have space to write anything but the words 'Posta Para Plantas.' We flirted with the idea of writing it in Quechua, 'Posta Chajrapaj,' which we rejected because hardly anyone reads Quechua. It's a sad case, which can be laid at the door of colonialism, bigotry and narrow-minded nationalism, but people in this part of the world speak one language and write another.



PURPLE TUBERS, that grew on the stalks above ground. Quechua-speaking farmers call this set of symptoms **qhelqe**, or **qherqe**³.

After a fair amount of running around and looking for markers, Ernesto was drafted as the person with the best penmanship. While he inked in the sign, Martin joked that it was like a government road project, with one person working and seven people watching. It was a bit, so I handed out some of my recent publications. While the group dutifully flipped through them I suggested we practice the talks for tomorrow. They laughed, "They'd have to do it in Quechua, and we wouldn't understand it." So I let it go. I knew that our three Quechua speakers, René, Jaime and Daniel would improvise something worthwhile, and they did.

Classic vs. subtle disease symptoms OVER DINNER it struck me that the seed exercise was a little silly. We had some tubers completely hollowed out by weevils. Others were cracked and caked

³ I use italics for Spanish words (and scientific names) and bold for Quechua.

in fungal lesions. Others bulged with arms like they were dolls made from dough. And then we had a handful of perfect little seed potatoes: the size of large walnuts, pinkish, just starting to sprout, and lightly dusted with soil. In their own way they were as pretty as roses. Any fool could see which ones were good seed. I suggested that we pick out some tubers with less obvious differences. The guys all agreed.

Good ideas for Chuquisaca AFTER DINNER I buttonholed Daniel Vasques and asked him if he had any ideas about working with PPP in Chuquisaca. He poured out ideas for half an hour, with his characteristic quiet enthusiasm. He was keen to start Postas in Chuquisaca. He said he could go to the Tarabuco fairs on Sundays. Farmers in the whole department are desperate to find a solution to tuber moth, and that PROINPA's bio-insecticide could be just right.

He is also interested in working in Ravelo, where he could try to do something with PROINPA, and in Zudáñez, where he could perhaps involve ATICA in maize and potatoes.

He suggested working with (a certain institution) in Ravelo. I asked if they were as bad as they were five years ago, when we went to their boarding school and found the headmaster and most of the teachers locked up in a room for a four-day drinking binge, while the teenage students just wandered about. "No," Daniel said "They're worse now. But there is one of them who is a promoter, who is a good friend of mine and a (local politician). He would be good to work with."

It looked a little too ambitious to me. It takes all day just to get to Zudáñez and back. Ravelo is also several hours away, but in the opposite direction. I suggested starting with one or two municipalities, like Tarabuco, and start preparing to work in Zudáñez and Ravelo. After all, PROINPA is going to work with one *municipio*, and CIAT works with two. Daniel agreed to work in Tarabuco, and to sell PROINPA's bio-insecticide Matapol® from the truck stop in Sucre, three days a week, and cover all of northern Potosí that way. It's an excellent idea. PROINPA has had this stuff for years, and sales are still modest, while farmers are begging for a solution to the tuber moth (Bentley et al 2003b). Daniel suggested coordinating with PROINPA/Sucre to send in samples. Also, people from the municipalities of Icla and Zudáñez come to the Sunday fair in Tarabuco, so by going to the truck stop and to Tarabuco, Daniel could cover most of Northern Potosí and Northern Chuquisaca.



Daniel with peach farmer in Tarabuco, close to Sucre

He also suggested working with the sub-mayors of the districts near Sucre (Río Chico, Potolo etc.) to have activities with them.

Daniel made it sound easy, working with local governments. He reeled off the names of little towns and explained which mayors or councilmen were his friends. He has spent a career in that part of the world, appropriately building up grass-roots political networks and that now he could use them to set up plant clinics.

Discussion WE HAVE three cases. CIAT is competently and gracefully working with two municipalities (Comarapa & Saipina), taking in samples, testing seed potatoes for seed-borne health problems, and GOING PUBLIC at the village fiestas. PROINPA is still enthusiastic about working with Tiraque. And Daniel Vasques is ready to take all of Northern Chuquisaca and Northern Potosí under his wing. This initiative has a great group of people working on it.

DAY TWO – TIRAQUE AND THE FAIR – 12 SEPTEMBER 2003

We'll Be Here Every Friday

Tropical snow FIRST THING in the morning, Daniel burst into my room. He grinned and asked “How did you like the rain last night? And the snow!” Snow?

The snow line was just above the station. At 17 degrees south, we are the same distance from the equator as Vietnam: firmly in the tropics, but at 3,400 meters above sea level it gets cold. And it was threatening to storm. But everyone was making friends. At breakfast Martin told Javier that at the Oruro carnival, five men had snatched his wife’s purse. She caught up with them at a sandwich stall. When she grabbed her purse back they attacked her. So she calmly struck back and her determination soon had the robbers scuttling away. It was the most inspiring story I had heard in weeks, and I cherished it for the rest of the day.



Snow in the hills above the Tiraque market

On the short, 14 kilometre drive to Tiraque, Daniel discovered that Ernesto Montellano was from Camargo, and Daniel said his father-in-law was from Tiraque, so they gossiped happily all the way. (Is so-and-so still the skinniest person in town? So-and-so was a great football player in his youth. It takes two boxes of fresh peaches to make one box of dried ones, called *mogochinchi*).

Working with local government WE WERE all still in a good mood when we stood in one of the courtyards of the large, two-story municipal government building. Then we were called into the office of the *Official Mayor*, the vice-mayor. He was 30-something, with a sour expression and an unmistakable hangover. He apologized, a little, for missing our meeting yesterday. He and the mayor were called away to a meeting, that they forgot about us, and that they got back late.

I made a little speech about how I hoped they would support us in the future, and we drove in three cars to the fair, four blocks away.

Small seed walks far AT THE market, Daniel said “let’s buy some seed for our demonstration.” So I followed him into a large area with no walls, under a tin roof. It smelled of earth and fresh bread, mouldy tobacco and, and the carrot-like scent of ocas. We found a woman standing by two sacks of potatoes, nursing a baby. She said it was seed, per 30 Bs. the arroba (25 lbs). Daniel ran his fingers over the little tubers. “Purin,” she said simply, in Quechua, literally meaning “It walks.” It was the same rhetoric that Zimmerer’s informants used in Cusco to describe small seed potatoes (Zimmerer 2003). The idea is that small seed walks well, far. It goes a long way. We knew René wanted to talk about that, so we decided to buy some. She said she would sell us a bit, but she didn’t have a small bag (she had come prepared to sell it by the 100 pound bag).

We walked away and bought small bags, and tried to buy a few pounds of seed from other people, with no luck.

“I just bought this for myself” a young man said.

Most people simply dismissed us. “Faltanqa” they said (literally “it won’t be enough,” meaning “I won’t have a full sack to sell if I sell some to you.”)

“This is for making chuño” one woman explained simply, as though any one should be able to see tell the difference between small, aged potatoes for seed, and small, aged potatoes for freeze drying in the mountains.

Learning some local knowledge WE WENT back to the first woman, and bought a few handfuls of seed potato, and found our colleagues setting up tables and samples of diseased potatoes by the *intendencia*, the small office which municipal government keeps on the fair grounds. The vice-mayor had sent for a megaphone, to inaugurate the *Posta para Plantas*. He asked us to wait, not to start without the megaphone. While we waited, farmers began to crowd around the tables. I was anxious to start, but Daniel took advantage of the time, chatting with the farmers in perfect Quechua. See Box 1.

Ideas for next time JUST WATCHING the interactions gave us ideas for what to do next time. “We should have a prescription pad (*recetario*), so we can write the recommendations down right at that moment for the farmers, without having to ask the people to come back next week,” René said. (So later that day we designed one). Javier suggested making a cassette, in Quechua, with folk music, to play loudly at the start of each session, to draw people in.

What the public demands FINALLY ABOUT 10 am, the megaphone arrived. It was nearly a meter across and meant to strap onto the roof of a car. After a minute of very loud Andean folk music, the *intendente*, Ernesto Orellana, explained that PROINPA had come to help them, in coordination with the municipal government, and that we would be here every week, to help them get rid of (**chinkachiy**) crop diseases, to tell people what products to use. The vice-mayor then said almost the same thing, in identical language. It was strikingly similar to what I hear campesinos ask over and over (“What can we spray to get rid of this pest?”). The *intendente* knew what smallholder farmers demand:

1. They want to lose crop diseases, not just lower the incidence.
2. They are willing to spend money to get immediate results (hence the interest in products that can be sprayed).



1 A second vendor naturally assumes Daniel wants at least 25 pounds, an *arroba*, of seed.



2 This man also refuses to sell us any seed. If he does he won't have a full hundredweight.



3 Daniel goes back to the first seed merchants, the only ones willing to sell us a small lot.

René Pereira then took the microphone, and promised to be here every Friday, to answer their questions and help them control their problems.

René, Jaime and Daniel went back to the tables, and began talking with the now slightly larger crowd about pests. The vice-mayor came up to me and said quietly, “Doctor, shall we go have a little something, for the cold.” I was flattered, and my policy is usually to accept whenever people are kind enough to offer hospitality, but this was *the* big moment for my friends, and for me too. “Later, I said. Let’s stay and watch this.” Without another word, the vice-mayor vanished. And that’s the last we saw of him.

Information, fast and furious

THE AGRONOMISTS then launched into some sweet, short talks, illustrated with real samples. The samples and the number of topics had multiplied over night. Jaime explained the life cycle of the Andean potato weevil, and of the tuber moth, and showed the astounded crowd the tiny, almost invisible eggs of the moths on a circle of paper in a Petri dish.



The symptom called **qhelqe**, which the GPC has recently identified as a phytoplasma. Many agronomists in the Andes wrongly believe this indicates *Rhizoctonia*.

He talked about nematodes, and the qualities of good seed. Then he described the *Globodera* nematode, and the many eggs in its tiny cysts. He demonstrated the test with a glass and newspaper, the one that Juan Almanza had done here almost two years ago (Bentley *et al.*, 2004). Only this time, the agronomists did the test with notebook paper in a bucket. It was an improvement. After all, most of the local people don’t have newspaper or drinking glasses in their homes, although they all have buckets, and their children have notebooks for school.

BOX 1 Gathering local knowledge at the fair

Daniel asked the farmers what pests they had:

- *Polilla* (potato tuber moth)
- **Piki piki** (various small Coleoptera)

I understood what the agronomists said, but not much of what the farmer said, softly but quickly, in a more idiomatic Quechua. Daniel later explained to me that the farmers said that they spray for tuber moths in their fields, and that they taught themselves to spray before the sun comes up, before the moths start to fly. The insecticide makes the moths drunk, and they die, along with other bugs. The farmers said that they were applying lime on potatoes in storage. The farmers would not apply insecticide on storage potatoes, because that was their food.

Daniel obviously filed this information away with what Javier had told him the day before: that PROINPA’s Matapol® was a safe, effective biological insecticide to use on storage potatoes. The farmers told Daniel that there were more moths in the low country (meaning below about 3,000 meters) but that the moths were spreading to the high country.

And discussing the larvae of Andean potato weevils in a bottle, one farmer said “that’s **laqatu**” (white grub), apparently confused by seeing them in liquid, in a glass vial.

Another farmer corrected him, “**papa khuru.**”

This went on for about an hour. Jaime Herbas showed the people a mass of potato roots infested with root knot nematodes, in a jar, and gave them a little talk on nematodes. (“That’s right, they live in the black soil, in the cold country.”)

The farmers also told Jaime and Daniel that greening potatoes helps to prevent tuber moths, which start in at the eyes. It seems like indigenous rather than extensionist knowledge. The vocabulary is certainly local; they call greening **q’oyuyuchiy** from the noun **q’oyu** meaning ‘a large, dark green bruise.’

The agronomists showed the farmers the potatoes with purple, aerial tubers. Like the farmers that Eric Boa and I met near Pocona, these men called the symptom **qhelqe**, and they said that it always shows up, a plant here, a plant there, and that they manage it by digging it apart, and by not mixing it with the other potatoes.

It was hard to hear. The loudspeaker was still blaring music, so we asked the *intendencia* to turn it off, which they obligingly did.

Jaime then explained the bioassay (for a description see Bentley *et al.* 2003). Then he picked up one of the specimens that Javier had brought: bottles of Nescafe, with diseased potatoes in them, and talked about *Rhizoctonia*. René then showed the paper with *Globodera* cysts on it.



ABOVE We talked a little about the seed on sale that day, some of which was poor quality.

LEFT Jaime, left, and René (white cap) show *Globodera* (nematode) cysts to the public.

Jaime talked about Matapol Plus®, showing some tubers neatly coated with PROINPA’s white, bio-insecticide powder. He said that it kept moths out, and that it made the moths sick, but did not make people or livestock ill.

By this point, the crowd was breaking up into two or three small groups around the three Quechua-speaking agronomists. It got harder to follow what was going on. René talked about using good seed. Then he talked about **qhelqe**, and about ‘wart’ (*verruca*, **sirk’i**) on potatoes. He said it was contagious, that there were ‘cures’ (**jampis**) that could be used, and to bring in their samples every Friday.

Small seed RENÉ SAID that the smaller seed was, the more problems it had and thus more diseases. “Use seed like this, the size of a hen’s egg. The bigger it is, the stronger it is.”

René went on about seed. He said to plant potatoes with seven or eight eyes. He held up a blind one, and said: “If you plant ones like this, you lose a lot of production. This one has ‘apical dominance’ (using the Spanish phrase). Only one sprout will come out. But if each seed has four or five good sprouts, you will get five plants, and 20 tubers.”

A fair is a most public place.
Anyone can go there uninvited and
do whatever they like, so like as it
is not a criminal act. Not everyone
likes to work in a bustling farm
fair,
but we do.



This man saw the crowd we had gathered and walked by, twice, loudly playing the wooden saxophone and other handmade wind instruments which he was selling. It was only mildly annoying. Later he proudly posed for the camera. Notice the bottled cooking gas, beer and soft drinks on sale in the truck behind him.

The freedom to be rude GOING PUBLIC in a fair is not like standing up like a teacher before a polite audience in a village. A fair is public. People come and go as they please. They are more anonymous, and so bolder than when they have been talked into attending, say a farmer field school. We saw an example of this when René cleverly improvised a talk around the seed that Daniel and I bought that morning. “There are various problems in this seed. This one has not sprouted, and will only yield four potatoes. This one (holding one with fungal lesions) will grow a plant with **qhelqe**.” Here René was following the conventional agronomists’ wisdom that the shiny, purple tubers were symptoms of *Rhizoctonia*.

“No” a farmer interrupts him. He picks up one of the beautiful seed tubers we brought from Toralapa. He flourishes the healthy little potato and says emphatically “chaymanta” (from these). He knew that the phytoplasma-like symptoms are found on plants grown from the best looking seed. Then he put the seed down, spun on his heels and marched off.

In touch with the people EVEN THOUGH one farmer disagreed with one thing he said, René was clearly hip to local farmers’ perceptions. He explained the life cycle of the tuber moth, and that it lays its eggs in stored potatoes. “But that bug comes out of the ground when I plough,” a farmer says. René was happy to explain that there are two kinds of moth, but one is found in the field and one in storage. He went on to say that they lay their eggs in the eyes of potatoes, and that the adults hide inside the leaves. “When it rains, when we disturb them (at harvest) they fly out, and lay eggs.”

René explained that the weevils lay eggs, eat potato leaves, and that the larvae grow in the tubers. That’s why it is important to use good seed, and high cultivation, to heap lots of earth around the plants in the field, to keep out the weevils. Assuming the voice of the farmers, René said “We usually say that the weevils come from oats. But they don’t come from oat fields; they were in the potatoes all along.” The farmers pay attention, and nod in interest. One of them asks something.

René says: “This bug is growing, and we think we can hurry up and sell our potatoes before it comes out, but it has already been in there for two months. We just haven’t seen it.”

Radio interview A YOUNG MAN with a tape recorder, every hair in place, and a vest labelled PRENSA in bold letters approached us for an interview, for Radio Chiliwa, which Jaime said has a large audience. The journalist talked in Spanish with the agronomists, and then switched to Quechua when he turned on the tape recorder. René said that the Posta would be open every Friday, from 9 to 11 AM.

The crowd thinned out about 11:30, and we were all a little tired. We packed up the stuff to go. I asked Martin how many people he thought had come. “Maybe 150,” he said. “At least 100.”

“That’s like four farmer field schools.” I said.

The municipal agronomist appears AT MARTIN’S car, a young man stops us, to tell us that he’s the student agronomist, working with the municipal government, and that he didn’t know we were coming. He would have loved to participate with us. They mayor and vice-mayor didn’t tell him. Later René told me that the young man had talked to him, too. René agreed to give him some training and to incorporate him into the Friday sessions.



THE MESSAGE HITS HOME. As we drive out, a man comes up and asks us if we know where he can buy good seed

In August, while doing a study of institutions in Bolivia, Peru and Ecuador, a Bolivian scientist told me that one of his institution’s biggest accomplishments was “learning to work with corrupt municipal governments.” I didn’t know what he was talking about at the time, but by now I was starting to get the point.

Follow up THAT AFTERNOON the team met, and we agreed that we would:

1. Design the forms to use in the Posta (a log or *bitácora*, and a sheet for the farmer with the diagnosis and recommendation, the *forma de entrega*).
2. Make a list of flyers (*fichas técnicas*) we would need (Table 1).
3. Write a promotional pamphlet.
4. Record a tape with music to play every Friday while opening the Posta.
5. Make videos to play over the municipal TV station.

We drafted the first three at the meeting, and Javier finished them the next day. Javier agreed to supervise the other two later at the office.

Table 1 List of technical flyers to prepare, including

LOCAL NAME	ENGLISH NAME
Gusano blanco	(larva of the) Andean potato weevil
Tizón	Late blight (<i>Phytophthora infestans</i>)
Polilla	Tuber moth
Nematodos (prueba de vaso) ^a	Nematodes (glass and paper test) ^a
Nematodos (bioensayo) ^a	Nematodes (bioassay) ^a
Semilla	Seed
<i>Rhizoctonia</i> or Rhizoctoniosis	Used, confusingly, to refer to true <i>Rhizoctonia</i> infections and a phytoplasma disease ⁴
Q'epicha en haba y arveja	Aphids in broad beans and peas
Mancha chocolatada (<i>Botrytis</i>) en haba	Chocolate spot (<i>Botrytis fabae</i>)

^a Both of these exercises are described in Bentley *et al.* 2003.

No false expectations MARTIN DROVE Daniel and I back to town. Martin said that one thing he liked about the Posta was that it does not create false expectations. You don’t even give away caps or snacks. People come, get their identification, their information, and they take it away right there.

Expanding WE TALKED about how we should look for funding to start other pilot Postas in places like: Pojo, Cliza, Punata, and El Puente.

Martin suggested that we meet with the funding expert at ATICA. Later, at his office, Martin mentioned the Postas to Andrés Burgoa, who agreed that it would be interesting to start a Posta Para Plantas in Sacabamba, where ATICA works.

⁴ Thanks to work carried out by LADIPLANTAS in Comarapa, with help from Phil Jones of the Global Plant Clinic, we know that the distinctive above ground tubers found in Bolivia are associated with a phytoplasma, not a fungus. According to experience in North America, *Rhizoctonia* infections, which have diagnostic symptoms of black lesions on tubers, roots and the base of stem, can also stimulate aerial tuber production. This appears to be the source of confusion in (wrongly) applying rhizoctoniosis to include what we know recognize as a separate phytoplasma disease in Bolivia.

As I said good-bye to Daniel, I said, “I’ll look forward to seeing what you do in Tarabuco and at the truck stop in Sucre.”

“Yes,” Daniel said. “But at the truck stop it will be different; I’m going to sell Matapol.”

DAY TWO – DISCUSSION

Just the start

AT THIS FAIR, we went through ***much more material*** (at least eleven topics⁵), much faster and fewer times and in less detail than the first time, when Juan Almanza did three nematode exercises there on 7 December 2001 (Bentley *et al.* in press). Although, as Javier and René pointed out, this time we were GOING PUBLIC to draw a crowd and advertise the Posta, which we did. Also there were a lot more of us this time. In 2001 it was just Juan, an assistant, and Eric and I. This time there were three people capable of giving technical discussions in Quechua, and six others looking on (including the plant pathologist Giovanna Plata and entomologist Luis Crespo, who graciously came the second day in case we needed their help).

GOING PUBLIC, and Postas para Plantas, can be ***formats for learning local knowledge*** and practices (e.g. farmers in Cochabamba green potatoes to prevent tuber moth damage, they apply lime to stored tubers and they spray for tuber moths before dawn). It is a great way to get feedback; recall the farmer who turned and left after telling us that the greasy-looking, purple aerial tubers come from healthy-looking seed.



Still smiling. Ernesto, Javier, Martin, René, Daniel (from left)

Still, it would be worthwhile to have more farm visits, to do an ***ethno-pathology*** study of farmer perceptions of disease and pests. **Qhelqe** is an obvious example, because it is an important disease and because until recently, even experts in the Andes confused it with *Rhizoctonia*, which actually is present as well. (What do farmers know about these diseases? Do they distinguish them? How do they manage them?) Others might include bacterial wilt and tuber moths.

Replicable? THIS IS a special situation. The Toralapa station is in the municipality of Tiraque; René is head of station and he has an appropriate interest in contributing to the community and cultivating good relations. We will still gain useful experience in Tiraque, but not all of the experience will apply to other municipalities. PROINPA simply does not have enough top-notch, Quechua-speaking agronomists like René and Jaime to work in all of the 42 municipalities of Cochabamba. Without a local person in the municipal government to take over the day-to-day

⁵ Life cycle of the tuber moth, Matapol®, Andean potato weevils, two genera of nematodes, seed size, seed sprouting, warts, and **qhelqe** (*Rhizoctonia*), plus telling people to come back and bring in samples the following week.

running of the Posta, it may die an early death, or to use that now worn-out cliché, it may not be sustainable. We still need to work more with the municipal government and probably should sign a *convenio* with them.

Seed health BUYING SOME samples of seed being sold at that fair, and discussing them there can be a valuable lesson. We did a bit of that this time, but there is more potential.

Self-selected clients GOING PUBLIC and Postas para Plantas are both public services where the users choose themselves, and decide how much or how little they will participate. If we do this right, we will reach a large, self-selected audience, that values the service for what it is – *information* – and not for handouts or other goods which they think they might get out of it later. Women, the poor, elderly, and people with little formal education should have easy access to the Postas.

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