

## Taking plants to the doctor: plant health clinics from Bolivia to Bangladesh

### Key fact:

Plant health clinics in nine countries are giving farmers unprecedented access to expert advice on pests and disease. As well as promoting good pest management, the low cost clinics are bringing thousands of farmers into mutually beneficial interaction with researchers.

### Summary:

A series of DFID partners have, for the last ten years, been establishing walk-in plant health clinics in nine countries to provide expert advice to smallholder farmers dealing with pests and disease. Accepting any query on any crop, the clinic 'plant doctors' diagnose problems and write down treatment advice prescription-style. When necessary, samples may be sent to partner labs, giving poor farmers access to world class diagnostic services. The result has been smarter and lighter use of pesticides, as well as increased incomes for farmers and a new relationship between research and farming.



The mobile plant clinic at Tirail in Bangladesh, attracts farmers with diverse problems (Eric Boa)

The project started in Bolivia, where eight clinics serve thousands of remote farmers, and has spread to environments as different as Bangladesh, where visiting farmers report average crop income boosts of 37.5 per cent. Breaking the mould of the traditional development project, plant health clinics are intended as self-sufficient fixtures of the community, providing a public service that can truly change farmers' livelihoods.

### Facts & figures<sup>1</sup>

- ❖ There are currently over 80 regular clinics operating in Bangladesh, Bolivia, the Democratic Republic of Congo, India, Nepal, Nicaragua, Sierra Leone, Uganda and Vietnam.
- ❖ As of 2009 the Bolivian clinics had attracted more than 9,000 queries from over 6,000 farmers who originated from nearly 900 different villages in three major regions.
- ❖ In Bolivia the clinics are called *Postas para Plantas* (plant posts) to draw a clear analogy with human health clinics, *Postas de Salud*.
- ❖ In Bolivia, farmers surveyed after adopting clinic advice reported mean rises per hectare in net income of US\$691 from improved potato farming, US\$2,704 from tomatoes, US\$2,362 from strawberries and US\$6,494 from peaches, all in their first year.
- ❖ Pests destroy between 10% and 25% of harvests in Bangladesh, despite the estimated 49,000 tons of pesticides used every year.
- ❖ Among the most frequently diagnosed problems at clinics in Bangladesh were stem borers and zinc deficiency in rice, shoot and fruit borer in eggplant, and die-back and hopper infestation in mango.
- ❖ Adopters of clinic recommendations in Bangladesh reported average yield increases of 1.43 tons per hectare and market price increases of 22%, even as their average crop protection costs decreased by more than 13%.
- ❖ Farmers observe and name plant health problems differently from scientists. Three ethnopathology studies carried out at clinics in Bolivia, Bangladesh and Uganda have helped plant doctors learn from farmers' understandings of plant ill-health and give suitable advice on control.

## Plant doctors: plant health clinics from Bolivia to Bangladesh

Smallholder farming is the world's largest occupation, but small farmers are often on their own when it comes to unfamiliar diseases and pests. Smallholders grow and experiment with a large variety of different species, and unlike big commercial farms they can't afford to hire specialists when an unknown problem prevents a crop from thriving. When their own knowledge and their neighbours' advice falls short, there's nowhere to turn but chemical dealers with vested interests or increasingly over-burdened, unresponsive government extension services. Too often the answer is costly, harmful, and ultimately ineffective pesticide use.

Plant health clinics are bringing a new resource to farmers in many countries, providing an on-demand service as personal as a visit to the plant doctor. Now a decade old, these clinics are not development projects: they are new, permanent, and self-reliant fixtures in their communities, run by plant specialists who have decided to apply their expertise in the most direct way. A clinic can be built from nothing but a table in the shade, a cloth banner, and a dedicated expert with a will to learn, but it can potentially change the way farmers grow their crops and the way they relate to the research world.



**Posta para Plantas (clinic), El Torno, Bolivia (Eric Boa)**

The idea sprung up, unplanned, in Bolivia in 2000. A research organisation called CIAT Santa Cruz (Centro de Investigación Agrícola Tropical) opened a diagnostic laboratory, Ladiplantas, in a small town as part of a DFID-funded study of potato pests. Local farmers began to drop by the lab asking for advice on crop problems, and the scientists, who knew many of the farmers personally, were happy to oblige. The lab's role in the community became clear and Ladiplantas soon began opening its doors as a clinic. The scientists asked farmers to bring in samples of diseased plants for analysis and wrote recommendations out on a prescription pad, following the example of rural doctors everywhere. By 2009 CIAT, PROINPA and other organisations were running eight plant clinics in Bolivia, serving over 6,000 farmers, and the idea had spread to nine countries in Latin America, Africa and Asia.



**Parvin from RDA, Bangladesh, supervises plant doctor Afroza at village clinic designed to improve access to women farmers (Paula Kelly)**

Another country to establish clinics is Bangladesh, a very different place to farm. While Bolivian farms are often so remote that researchers have difficulty even finding them, Bangladesh's population density is 100 times higher, with two thirds of people working in agriculture. With so many farmers relying on so little land, the 18 clinics that have opened here since 2004 have proven very popular.

With so many crops and so many problems, aspiring plant doctors have to move outside their specialist fields and learn to be generalists. It's an important part of the clinic philosophy that all plants are welcome, a counter to long-standing research bias towards just a few major crops. The potato is the staple of Bolivian farmers but they also come to clinics with tomato plants, strawberries, peach and citrus fruits, peppers and peas, and dozens of other crops. Clinic doctors even identified an aphid attacking one town's cypress trees, helping save these important wind breaks and providers of shade and timber. In Bangladesh the major crop is rice, but farmers also seek help with mango and coconut trees, aubergine, beans, and countless local varieties of gourds, vegetables, and fruits.

Dealing with the full spectrum of crops and causes of ill-health (pests and diseases as well as soil and other abiotic problems) is no easy task and requires constant cooperation between clinics and laboratories. Building an integrated plant health system has been an ongoing process with benefits on both sides. In Bolivia, clinic queries have resulted in four peer-reviewed new disease reports in scientific journals and led to a significant research article on a newly discovered tomato disease. New knowledge helps authorities manage better responses to help farmers. At the same time poor farmers have unprecedented access to some of the best diagnostic labs in the world, including at the Global Plant Clinic (GPC) managed by CABI in the UK.



**Olivia Antezana of Ladiplantas, CIAT, examines clinic samples back in the lab (Jeff Bentley)**

Assessment has shown that almost all farmers try out the recommended treatments, and the results are good: increased yield



**Farmers benefit greatly from timely clinic advice which increases yield and quality of high value peaches (Eric Boa)**

and crop quality, and reduced spending on unnecessary pesticides, produce big returns. In Bolivia adopters of advice reported an average boost to income of almost US\$700 per hectare in potato farming in consecutive growing seasons (before and after adopting advice) and even more for fruits and vegetables - up to US\$6,500 per hectare for high value peach crops. Significantly, the gains were broadly equal between poor, medium and wealthy farmers, proving that treatment doesn't have to be a luxury. In Bangladesh average income increases tallied at about US\$1,300 per hectare, or 37.5 per cent, after adopting recommendations. Farmers reported that they spent the extra income on their children's education, housing, and new investment in cattle, orchards and crops.

### Testimonials:<sup>2</sup>

- Julián López, potato farmer, Cebada Jich'ana, Bolivia:** Julián is a farmer in Cochabamba, long known as the 'potato basket' of Bolivia. In the past decade, however, the Andean potato weevil became such a destructive pest that even here in the heartland of the potato farmers began giving up on the crop. After planting five tons of seed one season, Julián only harvested five bags of potatoes that were not rotten. He tried to feed the rotten tubers to his sheep but they became sick and almost died. In 2005 the clinic organiser PROINPA sponsored farmer field schools (FFS) in the area, working with farmers to find the best weapons against the pest. The most effective also turned out to be the simplest. Following harvest, the weevils crawled from the unearthed potatoes back into the soil. If farmers dug up the soil again under the spots where the tubers were piled, their chickens would eat the exposed weevils out of the field and they would not be a problem in the next season. The farmers and the plant doctors at the clinic spread the word, and with easy techniques like this Julián was able to join other farmers in reclaiming the potato basket.

## Additional case study information

### Costs and benefits:<sup>3</sup>

Plant health clinics set a new standard for low-cost action, requiring little more than a table and a few chairs in a shady spot at a local market. Small stipends provided by the Global Plant Clinic (GPC) have helped to get clinics off the ground and prove their worth; the clinics have subsequently found a variety of ways to sustain themselves for the long term. The minor operating costs may be supported by the annual work plans of the organisations involved, by local municipalities or national governments, or through small fees charged to farmers who use the clinics. They may also be run by farmer coops as a service to their members.

For farmers, the costs of following clinic advice are also generally low, and in many cases they actually save money they have been wasting on ineffective pesticides. The benefits for farmers extend to thousands of dollars in increased production and crop quality: a small part of the untold thousands of tons of food lost every year to pests and diseases, but certainly a boon to smallholder livelihoods.

### DFID contribution to research:

The first clinic in Bolivia grew out of a DFID-funded project, MIP Papa (Integrated Potato Pest Management), which gave rise to the Ladiplantas diagnostic laboratory. Today, DFID funds the Global Plant Clinic (GPC) managed by CABI in alliance with Rothamsted Research and the Food and Environment Research Agency. DFID has provided more than £1 million in funding since the body's inception in 2002. The GPC in turn supports the more than 80 plant health clinics around the world with start-up grants, diagnostic lab services, training, quality control, impact assessments and links to the larger plant health community. GPC also publishes peer-reviewed new disease reports, extension material written by plant doctors and research on building plant health systems.

### Research milestones:

- 2000 CIAT Santa Cruz opens Ladiplantas in Comarapa, the first community-based diagnostic clinic to offer advice to local farmers.
- 2001 PROINPA experiments with 'Going Public' exercises in Tiraque, Sucre and Comarapa, prompting the idea of running plant health clinics in public markets.
- 2002 CABI's diagnostic and advisory service becomes the Global Plant Clinic, shifting its activities to support the new plant health clinics.
- 2003 First ever plant health clinic in Bolivia starts in Tiraque market, soon followed by Los Negros.
- 2004 The first clinics in Bogra district, Bangladesh start up with funding and technical support from CABI.
- 2008 Directorate of Food and Agricultural Health takes over running of Los Negros and starts their own clinics in Santa Cruz 2009.
- 2009 Major impact assessment efforts are undertaken to investigate the successes of clinics in both Bolivia and Bangladesh.
- 2009 Total of 45 peer-reviewed new disease reports published from the GPC since 2002.
- 2010 Five new countries will start plant health clinics with another five in 2011.

### Photo credits:

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### Multi-media materials:

Global Plant Clinic's YouTube Channel

[www.youtube.com/user/globalplantclinic](http://www.youtube.com/user/globalplantclinic)

### Links:

Global Plant Clinic: [www.globalplantclinic.org](http://www.globalplantclinic.org)

CABI: [www.cabi.org/default.aspx?site=170&page=1017&pid=2301](http://www.cabi.org/default.aspx?site=170&page=1017&pid=2301)

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<sup>2</sup> Bentley, J.W., E. Boa, F. Almendras, P. Franco, O. Antezana and O. Díaz, (2010) How farmers benefit from plant clinics: An impact study in Bolivia. Paper to be submitted to *International Journal of Agricultural Sustainability*

<sup>3</sup> Bentley, J.W., E. Boa, F. Almendras, P. Franco, O. Antezana and O. Díaz, (2010) How farmers benefit from plant clinics: An impact study in Bolivia. Paper to be submitted to *International Journal of Agricultural Sustainability*



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