

# Chapter 1

## Plant Healthcare for Poor Farmers Around the World: Gathering Demand and Innovative Responses

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### 1.1 Introduction

The first plant health clinics<sup>1</sup> began in Bolivia in 2003 with the help of the Global Plant Clinic (GPC). Six years on there are nine regular clinics operated by the two original clinic organisations, CIAT Santa Cruz<sup>2</sup> and PROINPA, with the Universidad Mayor de San Simón (UMSS) joining the scheme in 2006. The clinics in Bolivia have inspired people in other countries to run their own clinics and, by early 2009, there were schemes in ten countries across Latin America, Africa and Asia, including Bolivia, giving a total of 81 regular clinics who receive support from the GPC (Table 1.1, Fig. 1.1). The number of regular clinics varies but is remarkably stable given uncertain funding and weak support from governments to agriculture.

The origins of the GPC and the beginnings of the plant health clinics in Bolivia are described by Boa (2009). The purpose of this chapter is to draw upon experiences from a larger group of clinics and country schemes in order to explain how clinics function; the role of the GPC in relation to plant doctors and the organisations they work for; and to present selected results from clinics.

As the more advanced schemes in Nicaragua (Danielsen and Fernández 2008), Bangladesh and Bolivia have grown so their successes have encouraged the development of networks that link clinics first to each other and then groups of clinics to other resources, for example diagnostic laboratories. The Bangladesh and Bolivia schemes have been operating for longer than Nicaragua and have generated many new ideas

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<sup>1</sup>Plant health clinic is the preferred title though this is shortened to plant clinic or simply clinic. In Bolivia the clinics are called Postas para Plantas ('plant posts'), by analogy with human health clinics (Posta de Salud) and Puestos para Plantas in Nicaragua. Other variants include mobile plant clinic and rural plant clinic.

<sup>2</sup>An agricultural institute belonging to the Department of Santa Cruz in Bolivia and distinct from CIAT in Colombia, an international research institute and member of the CGIAR.

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**Table 1.1** Plant health clinics supported by the Global Plant Clinic from 2003 up to June 2009

Country	Year started	No. of clinics	Frequency
Bangladesh	2004	19	Regular
Benin	2006	(3)	Pilot
Bolivia	2003	9	Regular
Cameroon	2007	2	Pilot
Colombia	2006	(2)	Pilot
Côte d'Ivoire	2006	(1)	Pilot
Cuba	2005	(2)	Pilot
DR Congo	2006	9	Regular
Guinea	2006	(1)	Pilot
India	2006	2	Regular
Indonesia	2007	(2)	Pilot
Kenya	2005	(4)	Pilot
Mali	2008	(1)	Pilot
Nepal	2009	3	Regular
Nicaragua <sup>a</sup>	2005	18	Regular
Pakistan	2009	(2)	Pilot
Peru	2008	(2)	Pilot
Rwanda	2006	1 and (3)	Regular from 2009
Sierra Leone	2006	13	Regular since 2008
Sri Lanka	2009	(1)	Pilot
Uganda	2005	4	Regular since 2006
Vietnam <sup>b</sup>	2007	1	Regular
Total		105	81 Regular, 24 Pilots

Number of pilot clinics are shown in brackets

<sup>a</sup>The number of clinics has fluctuated in Nicaragua since 2007 but new ones will start in 2009

<sup>b</sup>In addition to a regular clinic at SOFRI, plant doctors have held more than 11 mobile clinics up to 200 km from the institute headquarters in My Tho

and results which have not yet been published. However, reports are available at [www.research4development.info](http://www.research4development.info) under the GPC section several articles have been published (e.g. Bentley et al. 2007; Kelly et al. 2008) and a major paper on Bolivia has recently been published (Bentley et al. 2009a).

The activities of the GPC extend beyond establishing and supporting plant clinics. The initial aim of the GPC was to work 'more closely with farmers' and organisations who supported them. We began with short training courses on 'field diagnosis' (recognition and interpretation of symptoms) which have since expanded to address broader needs; agriculturists and farmers required more than better diagnostics. As our engagement with these groups has increased so has our understanding of how to help improve plant health systems and wider aspects of extension. I will include a brief review of a new extension method, Going Public (Bentley et al. 2003), plant disease surveillance and new disease records and ethnopathology studies (Bentley et al. 2009b). These are three examples of innovative actions and responses that originated through interactions between the GPC, farmers, and staff who help run plant clinics.

In his classic book about plant diseases, 'The Advance of the Fungi', Large (1940) talks about plant health systems and plant doctors. This was a natural consequence

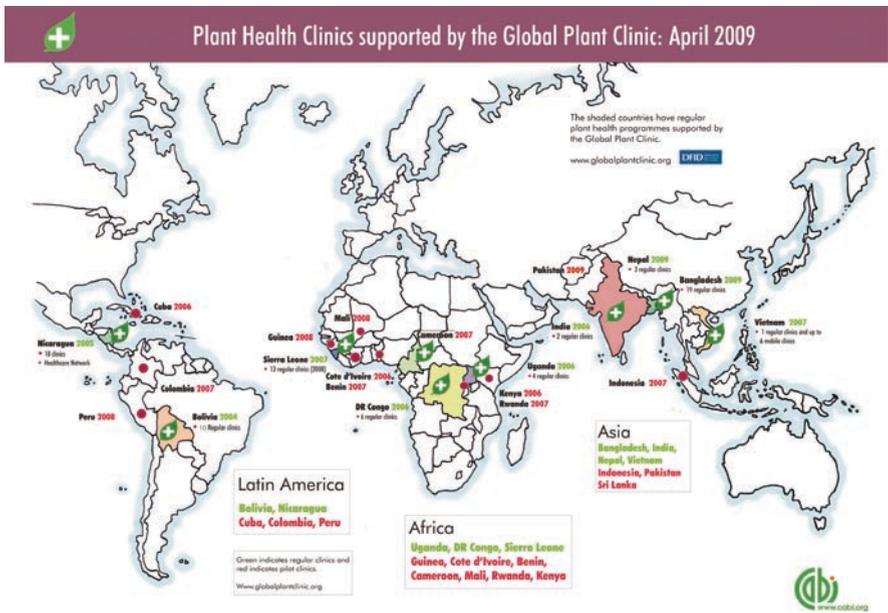


Fig. 1.1 Plant clinics supported by the Global Plant Clinic up to April 2009

at the time of drawing analogies between plant health and human health, a connection which has since faded. Anderson (2007) notes a renewed importance and interest in extension and advisory services and the unequal influence of research and researchers able to exert a stronger influence on agricultural agendas.

Despite a modern concern for extension, an historical neglect has led to a lack of innovation in advisory methods. The time has come to rethink how farmers’ needs are best served, particularly in developing countries, where agriculture is the most important business for hundreds of millions of poor people. Yet farmers in developing countries are poorly served by extension services. Despite the huge numbers of extension workers employed by governments, accountability to farmers is low (Anderson 2007) and farming communities are widely dispersed. Even the best extension workers struggle to meet all their assigned clientele and farmers have few reliable and consistent means for expressing their demands.

Plant health clinics are not a new idea and the United States and other developed countries have effective plant health systems that serve farmers well and have done so for many years (Campbell et al. 1999). In the context of developing countries, however, plant clinics are a ‘new’ method for farmers and their communities. A majority who visit the clinics say this is the first time they have been able ask for help with a plant health problem (Fig. 1.2).

Plant clinics are a new opportunity to create effective plant health systems in developing countries and to deliver plant healthcare to more farmers. Healthcare is an important concept since it encompasses treatment and management of illness



**Fig. 1.2** Plant health clinic held in Sundarbazar, Lamjung Province, Nepal in December 2008. Farmers bring in diseased samples which the plant doctors, supported by World Vision International Nepal, examine and give recommendations for control. Many women farmers attended who had travelled for several hours to get to the clinic

and the preservation of good health. It is a familiar concept in human and animal health yet receives little mention for plants. Plant healthcare is central to the GPC's mission since it encourages us and our partners to consider all aspects of how plants are grown and to seek useful solutions for all types of problems, not just pests and diseases. Of course this also increases the challenges for plant doctors in gaining knowledge and skills necessary to diagnose problems and find these solutions, but these are challenges that need to be firmly addressed if our interventions are to have an impact on farmers' livelihoods.

Richards (1985) was one of the first to highlight the gap in agriculture between science and development, based largely on his experiences in Sierra Leone – coincidentally a country that began plant clinics in 2008. While this gap has been reduced over the last 30 years through greater involvement of farmers in research and extension, and IPM farmer field schools have contributed much (Van de Berg and Jiggins 2007), a recent review of the impact of IPM extension emphasises that there is still much to do (Bentley 2009).

Plant health clinics alone will not cure systemic weaknesses in extension services or low adoption of technologies, but they do offer new advantages: they are demand-led; they provide regular and reliable advice to more farmers; the plant

doctors running them are accountable to the clinic users. There are also new collaborations to be made between clinics and farmer field schools, as Bentley (2009) has suggested: clinics respond directly to farmer problems; farmer field schools, can carry out locally adaptive research to find new or better solutions to problems.

The long term aim of the GPC is to create plant health systems within which clinics form a firm foundation for wider interventions and responses to farmer needs. The first step is to strengthen links with diagnostic laboratories and plant diagnostic networks (Miller et al. 2009; Smith et al. 2008). There are encouraging signs in Bolivia and Nicaragua of farmers sending in samples and gaining access to diagnostic services for the first time facilitated by plant clinics. Establishing clinics remains the first priority of the GPC, followed by monitoring of progress and quality control of services offered and the impact these have on farmer livelihoods. The many aspects of establishing and operating clinics are described by Danielsen and Fernández (2008) for Nicaragua.

## 1.2 Plant Health Clinics

Plant health clinics have several unique features: they accept any crop and any problem; they are run independently by organisations using existing facilities and personnel; they are open to all farmers. Plant health clinics are run in public places to increase visibility and access to farmers. The most popular venue is a market place, although a variety of other places are used, including agrochemical supply shops, schools, the offices of farmer co-operatives, village stalls. In Vietnam, SOFRI runs a clinic at their main research institute, which farmers regularly visit. They also hold mobile clinics up to 200 km away in order to expand their outreach.

Clinics are run by staff (plant doctors) belonging to many different types of organisations (Table 1.2) and clinic operators (Table 1.3). The success of clinics

**Table 1.2** Main categories of clinic organisations who work with the GPC

Category	Types
Community-based	Local and international development NGOs, farmer associations, co-operatives and similar. Work directly with farm families
Local authorities	Mayoralties, municipalities, district authorities and so on. Bodies with a local or regional remit
Research institutes	Science and technology, mostly applied research. Includes local institutes as well as international
Ministries of Agriculture	Key feature is public funding disbursed on a national scale. Includes phytosanitary inspectors and agricultural officers ('extension') and diagnostic labs (Nicaragua). Some extension is funded by region
Universities	Teaching (main role) and research. Some also run diagnostic laboratories
Companies	Privately owned

**Table 1.3** Summary of organisations which run or support clinics in 19 countries

Country	1			2		3		4	5	6	Total	Clinic status
	Community based	Research institutes	Ministries of Agriculture	Local authorities	Universities	Companies						
Bangladesh	2	1		1		2					6	Regular
Benin		1									1	Pilots
Bolivia		2		2				1			5	Regular
Cameroon		1									1	Pilots
Colombia					2						2	Pilots
Cote d'Ivoire					1						1	Pilot
Cuba		2									2	Pilots
DR Congo					1				1		2	Regular
India					2					1	3	Regular
Indonesia		1							1		2	Pilots
Kenya		1									2	Pilots
Mali		1									1	Pilot
Nepal	3										4	Regular
Nicaragua	9	5							3		18	Regular
Pakistan											1	Pilot
Peru	3	1									5	Pilot
Rwanda		1							1		2	Regular
Sierra Leone											1	Regular
Sri Lanka		1									1	Pilot
Uganda	3	1									5	Regular
Vietnam		1									1	Regular
All	20	20	7	3	12	4					66	

depends on the commitment of organisations as well as their staff. When clinics started in 2003 in Bolivia, the GPC already had well-established working relationships with enthusiastic staff from CIAT Santa Cruz and PROINPA, who then helped to establish clinics and keep them running. There are currently nine clinics in Bolivia.

All clinics operate in a similar manner. They are usually run by agricultural officers or technicians who take on the role of 'plant doctor' during weekly sessions which typically last for 2–3 h. The clinics consist of a table and chairs, shaded from the sun but clearly visible to passers by. A banner or prominent sign helps to attract people. These are the broad features of a plant health clinic: the location and timing depends on those conditions which attract the most clinic users. There are set instructions, however, on how to record information, using a register for the query and a prescription pad for writing a recommendation. Clinic data are vital to understanding demand and improving responses to problems. Recording the data so others can review it and benefit from the information is a major challenge, as is ensuring consistency and accuracy. But the data are also hugely revealing, showing which problems matter most to farmers and the ability of plant doctors to make helpful recommendations.

Clinics are also advertised on local radio, in newspapers, on television and by other ingenious means. In Bangladesh, the clinics are announced through a portable public address system carried through a village on a bicycle rickshaw, a method known as 'miking'. In Nepal, leaflets announcing a plant clinic were released from a car window en route to the clinic.

Farmers are requested to bring samples for plant doctors to examine, although clinics also accept many problems that lack supporting plant material. The quality of samples varies from well-selected and fresh plant parts, to dead branches, rotten plants and one or two isolated leaves. Gathering requests is a demanding job and one of the first tasks of the plant doctors is to encourage farmers to bring in good quality samples.

Clinics were started in Nicaragua in 2005 after identifying individuals keen to run them. However, individual enthusiasm is not enough if employers are unable or willing to allow the plant doctor to hold the clinic. The first clinic in Estelí, Nicaragua was run consistently for 3 years by a highly committed individual staff member, yet when a new project came along the plant doctor running the clinic was moved to a new place of work and the clinic ceased. In 2008 the GPC was invited to help establish plant clinics by World Vision International Nepal (WVIN). The initial contact with the GPC was made through a young and dynamic employee of WVIN based in Lamjung province, who had read an article about plant clinics in Nicaragua (Bentley et al. 2007). The discussions concerning the clinics involved employers of staff from the outset. Senior WVIN staff asked questions about how clinics would operate and the roles of plant doctors. They came to see a pilot clinic in operation. The Nepal clinics successfully started in the first half of 2009 with the positive endorsement of WVIN management.

As the clinics became better known and more people read about them (e.g. Bentley and Boa 2004; Bentley et al. 2007), the GPC learnt of new people and organisations interested in the idea. The plant clinics in the Democratic Republic of the Congo

came about through a consultancy visit for a cacao disease in North Kivu in 2004. We met Professor Ndungo Vigheri from the Catholic University of Graben and helped him start plant clinics in 2006.

The plant clinics in Sierra Leone began in 2008. The results from other country schemes and a successful pilot clinic held in Freetown in 2006 showed what the clinics could achieve and convinced the Government to fund 13 districts, one in each district. The clinics in Bangladesh began in 2004 through already established contacts with the Rural Development Academy in Bogra and the NGO Agricultural Advisory Society. A third organisation, Shushilan, joined in 2006 (Kelly et al. 2008). In India, contact was made with GB Pant University of Agriculture and Technology and they run two clinics.

The regular clinic schemes all began with one or more pilots. Those attending received first-hand experience of how a clinic operated, saw more clearly what they could achieve and learnt some of the challenges. The GPC shared the experiences of these pilot clinics through illustrated reports which contained short narratives and a few key messages. We also published photosheets of pilot clinics (up to six photos and short captions on an A3 sheet), videos on YouTube and newsletter articles (e.g. Bentley et al. 2007).

Advocacy has been a key part of the GPC strategy to establish more clinics. Two 15 min videos were produced by CountryWise Communications for Nicaragua and Bangladesh, and they have had a major impact in stimulating new interest as well as showing how clinics link to other organisations and project activities.

From 2003 until April 2009, 24 pilot plant clinics were held in 12 countries which have yet to establish regular schemes (Table 1.1). In Indonesia and Peru we were unable to identify a suitable clinic organisation in the short time available; in Cuba agriculture is closely supervised and running clinics requires official sanction at the highest level. In some countries (particularly Africa) new activities ostensibly depend on earmarked funding from projects. Attitudes are changing however, influenced by the results that clinics achieve. GPC advocacy is an important stratagem in effecting this change.

### 1.3 Plant Doctors

Unlike human health, the term ‘doctor’ is not a protected profession in agriculture; one can use the title ‘plant doctor’ regardless of qualifications or accreditation. We use the title plant doctor to describe a person who diagnoses plant health problems and offers advice on how to manage them. Most plant doctors are agronomists and many have years of experience of local agriculture and working with farmers (Fig. 1.3). Many do a much better job than they are given credit for (Boa 2009).

Plant doctor does not mean that the practitioner has equal knowledge of all types of problems, hence the importance of linking clinics to other sources of technical expertise. The GPC runs several short courses on ‘how to become a plant doctor’. These include modules on field diagnosis and running a clinic, plant



**Fig. 1.3** Yameileth Calderón, agriculturist and plant doctor, works for an NGO and held a Puesto para Plantas in Estelí, Nicaragua every Friday. She used her extensive knowledge of local agriculture to figure out recommendations that are suitable for local farmers

healthcare and extension messages. Over 40 courses have been run since 2002 and an estimated 800 people have attended at least one course in over 20 countries. As the number of practising plant doctors increase and clinics become a routine part of extension, professional qualifications and regular testing of knowledge and skills will be required.

In Nicaragua, the GPC trained trainers to teach the courses and in Bolivia staff from existing clinics are teaching new plant doctors. New modules have been added since the basic curriculum on ‘how to become a plant doctor’ was finalised in Nicaragua in 2007. The most important new module is ‘Monitoring progress and quality’ of clinic operations (Danielsen and Kelly 2009). Clinic performance needs to be monitored for consistency and reliability, and the quality of diagnosis and advice reviewed regularly to ensure that farmers receive the best advice. Monitoring quality is part of the increased accountability that plant doctors experience in providing face to face previous advice to farmers. Farmers return to clinics and comment on previous advice they have received. Plant doctors need advice on unknown problems and want to learn how to improve the services they offer.

Accountability helps to improve the overall quality of service of clinics. Some problems need further investigation and when a farmer returns for the results the plant doctors must be ready to explain what they have found out since the original consultation. Quality is about timeliness as well as accuracy of a diagnosis.

Selected clinic data from Uganda clinics (Table 1.4) show the range of crops that farmers bring (Table 1.5). The range of problems presented in clinics can

**Table 1.4** Uganda – plant health queries and crops by rank from three clinics, July 2006–April 2007

Crop	Queries	%
Banana	111	15.6
Cassava	97	13.6
Maize	83	11.7
Groundnut	55	7.7
Tomato	54	7.6
Coffee	47	6.6
Orange	32	4.5
Sorghum	32	4.5
Rice	30	4.2
Cabbage	20	2.8
Sweet potato	17	2.4
Beans	13	1.8
Green gram	13	1.8
Watermelon	12	1.7
Cowpeas	10	1.4
Eggplant	8	1.1
Pawpaw	8	1.1
Sesame	7	1.0
Avocado	6	0.8
Passion fruit	6	0.8
Onions	5	0.7
Eucalyptus	4	0.6
Millet	4	0.6
Cereals	4	0.6
Citrus	4	0.6
Jackfruit	3	0.4
Soybean	3	0.4
Bitter berries	2	0.3
Cotton	2	0.3
Mango	2	0.3
Potato	2	0.3
Yams	2	0.3
Anona (Kitaferi)	1	0.1
Cocoa	1	0.1
Elephant grass	1	0.1
Finger millet	1	0.1
Green pepper	1	0.1
Kulekula nuts	1	0.1
Lemon	1	0.1
Pineapple	1	0.1
Pumpkin	1	0.1
Red pepper	1	0.1
Sugarcane	1	0.1
Vanilla	1	0.1
No information	1	0.1
Total	711	100

**Table 1.5** Uganda – selected plant health problems from three clinics, July 2006–April 2007

Crop	Diagnosis	No.
Banana	Fusarium wilt	3
	Banana weevil	8
	Banana wilt	21
	Bacterial wilt	71
Cabbage	Black rot	5
Cassava	Mites	5
	Fungus	6
	Cassava brown streak virus	6
	Mealybug	7
	Root rot	18
	Cassava mosaic	43
	Citrus	Tristeza
Citrus	Leaf spot	3
	Fungus	5
	Fruit fly	6
	Leaf miner	14
	Scab	14
	Coffee	Coffee wilt
Groundnut	Aphids	4
	Drought	4
	Soil-borne disease	4
	Rosette	37
Maize	Nutrient deficiency	6
	Smut	7
	Striga	56
	Stalk borer	10

intrigue and confuse plant doctors at first: for many this is the first time they have received unsolicited queries. Over 100 crops have been received at the clinics in Bolivia, for example, with around 300 different problems that have abiotic as well as biotic causes (Bentley et al. 2009a).

The plant doctors get many things right but the clinic data also reveal the limits of their knowledge in detecting problems as well as selecting good advice. Reviewing recommendations is a sensitive matter since it is easy to undermine confidence of new doctors. Experiences in countries such as Bangladesh (Danielsen and Kelly 2009) show that the plant doctors are eager to learn how to improve. They are also keen to learn new skills, such as recognition of virus diseases, for example. The systematic collection and review of clinic data expose and confirm demands that other advisory methods are unlikely to reveal for such a wide variety of crops and farmers.

Research scientists with expert knowledge of a few crops can be daunted by the scope of the problems presented at the clinics. And being accountable to farmers is for many a new experience. A quote from a series of essays about the plant doctors

of SOFRI in Vietnam (Kelly and Danielsen 2008) illustrates the challenge for scientists in working at a plant clinic:

Truc has been a plant doctor for over a year, and is very happy to share her knowledge with farmers but admits that at first she didn't feel confident. With a biotechnical background, her training was mainly laboratory based, and Truc had little field experience. She sought advice from other plant doctors, read many books on field symptoms, and reviewed the clinic register to find out more. "Now I feel like a teacher as I train farmers and have many students. It is a good feeling to be a plant doctor.

In Nicaragua, Dimas Sarantes, an agricultural officer or técnico, had just obtained his first job with a farmer co-operative when he found himself involved with a plant clinic initiative (Danielsen and Fernández 2008):

At that time I was just finishing up at the university ... I had already sent my CV to the co-operative, and the next week they called me for a job interview. By the following Friday I was receiving farmers at the plant clinic.

We got training with the Global Plant Clinic and the National Commission for Agricultural Education (CNEA). Today we give a more accurate diagnosis, and we are not sending samples so often to the laboratory. We have been running the clinic for two years now, and it is bearing the fruit we all hoped for. In November 2007 we graduated as 'plant doctors', it's strange, but that's how it is. This has been one of my main achievements, an important added value to the work I do.

## 1.4 Plant Health Systems

Nicaragua has the most extensive plant clinic operations out of all the countries where the GPC supports clinic schemes (Table 1.1). See Danielsen and Fernández 2008 for a full description of partners and activities. By the end of 2007, 3 years after the first *Puestos para Plantas* ('plant health stalls') began, there were 18 clinics serving farming communities from San Juan del Río Coco in Las Segovias to Somotillo in El Occidente and Masaya close to the capital city Managua. The growth in numbers of clinics prompted the creation of a Plant Disease Management and Diagnostic Network, proposed and developed by Nicaraguan scientists, extension workers, university teachers and the phytosanitary authorities. The Nicaragua experience is described by Danielsen and Fernández (2008), who also reviewed achievements and performance of the clinics.

Although Bangladesh has a similar number of clinics to Nicaragua, there has been a slower integration of the individually successful clinics with other organisations that work on pests and diseases. Links to diagnostic laboratories are slowly improving as scientists understand the need to balance scientific priorities with establishing a reliable service for plant health clinics and serving farmers directly. The official government extension service in Bangladesh is keen to work more closely with the clinics but their involvement is hampered by competing demands to undertake other tasks and to respond to emergencies, such as flooding. Building relationships and creating robust links to the clinics

requires patience and persistence, supported by solid evidence of clinic results and benefits delivered.

Bolivia has also made good progress in creating a plant health system, albeit one built around Ladiplantas, a community plant clinic based in Comarapa and managed by CIAT Santa Cruz (Bentley and Boa 2004). CIAT manage five clinics and have their own diagnostic laboratory as well as technical staff to visit farmers in their fields. This integration of effort has strengthened the support by the Department of Santa Cruz (who fund CIAT) to farmers, combining regular and reliable advice in the clinics, with technical backup from Ladiplantas and follow-up visits in the field.

## 1.5 Surveillance and New Disease Records

Before the Global Plant Clinic began its programme of establishing plant clinics (Boa 2009), CABI offered an expert diagnostic and advisory service, also supported by DFID. Scientists would send samples to the UK for identification and recommendations on how to control problems. This service has continued and is a valuable component of the support the GPC provides to the plant health clinics and country schemes. The number of new disease records has increased significantly (Table 1.6), although discovery of new diseases through farmer queries is still a relative small proportion of the total published. A total of 40 new disease records have been published to March 2009, all in the journal ‘Plant Pathology’.

The clinics have a wider role in documenting current and emerging plant health threats (Table 1.5). The accuracy of diagnoses needs to be reviewed and unknown or unclear problems resolved. Examples recorded by plant doctors in clinic registers include ‘fungus on cassava’ or ‘soil-borne disease on groundnut’. Both statements are incomplete and need resolving in order to review any recommendations given.

**Table 1.6** New disease records from the GPC published in plant pathology according to IPPC region, 2001–2009 (March)

IPPC Region	Countries	NDRs
Africa	8	15
Asia	4	7
Europe	1	2
Latin America and Caribbean	7	15
Near East	1	1
North America	0	0
Total	21	40



**Fig. 1.4** Farmers in Western Kenya attend an impromptu ‘Going Public’ session by the road. The symptoms of napier grass stunt, a damaging disease which has affected fodder production, are explained and they ask questions about how to control it

## 1.6 ‘Going Public’ and Public Plant Health Campaigns

Plant health clinics have a fixed location. Their outreach varies but initial estimates are of a potential audience of 2,000 people in more densely populated areas. Clinics have regular contacts with thousands of farmers each week; nine clinics operating over a period of 6 years in Bolivia have attracted more than 9,000 queries. Yet there are many more who will not visit the clinic because they live beyond the outreach area, do not know the clinic exists, or are unable to visit at the appointed time.

‘Going Public’ is a mass extension method that was first used in Bolivia (Bentley et al. 2003). It has since been used in Uganda (Boa 2005) against banana xanthomonas wilt and in Kenya against napier grass stunt (Boa et al. 2005) (Fig. 1.4), a new phytoplasma disease that the GPC helped to confirm and study. In 4 days a team of four people visited 13 different sites in Western Kenya and explained how to identify napier grass stunt, how to control it and answered questions from a total audience of nearly 800 people.

'Going Public' is used by AAS in Bangladesh to extend the range of plant health services to communities that are not served by plant clinics. In Bolivia, Oscar Díaz of Proinpa used 'Going Public' regularly in market places to explain about methods for controlling major potato pests and diseases. 'Going Public' is the basis for Public Plant Health Campaigns (Jornadas de Salud de Plantas) which were developed in Nicaragua in 2008. These 'Jornadas' have been successful in their own right as well as reinvigorating the clinics (Danielsen and Colmenarez 2009)

## 1.7 Ethnopathology

Farmers describe plant health problems using a different vocabulary to scientists and agriculturists. The meanings of words used to describe these problems were analysed in three separate ethnopathology studies carried out in Uganda, Bangladesh and Bolivia. The results have now been published (Bentley et al. 2009b) and will help plant doctors understand better the potential causes of problems and to learn more about them.

## 1.8 Conclusions

Plant health clinics are responsive and accountable. After 6 years of running clinics and testing models in 21 countries important lessons have been learned on how best to organise clinics, train plant doctors to offer a reliable service to farmers and provide the basis for building plant health systems that integrate efforts and resources for increased impact on farmers' livelihoods.

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