

Plant clinics help curb pesticide use in Bangladesh

Paula Kelly and Jeffery Bentley of CABI's Global Plant Clinic were concerned to learn the extent of the misuse of pesticides in Bangladesh. Working with local partners Harun-Ar-Rashid, AKM Zakaria and Mostafa Nuruzzaman to investigate ways of improving the flow of advice, they report on innovative plant health services for farmers.

The eggplant fruit and shoot borer, *Leucinodes orbonalis*, is one of the worst pests that Bangladesh's farmers face. Farmers spray as many as 150-200 times in a single crop season to try to eradicate it. Fruits are sprayed after harvest to delay larval emergence and deter pests from further attack, in the hope of gaining higher prices on market day. Farmers insist that eggplants cannot be grown without chemicals, but see their profits shrink as they spend as much as one third of crop revenue on pesticides. Farmers report poor results from these chemicals, an alarming sign of increasing pest resistance, so they turn to their peers and pesticide dealers for advice. Dealers recommend stronger poisons, often far in excess of rates required, further perpetuating the problem and reducing future management options.

The cycle needs to be broken. But farmers rarely seek assistance from researchers. Extension often has a limited outreach at the field level, and campaigns to reduce pesticides produce fleeting benefits. A study of local knowledge in Bangladesh highlighted many other misuses of pesticides¹.

The origin of plant clinics

In 1999 in the small town of Comarapa in Bolivia, the staff of the Center for Research on Tropical Agriculture (CIAT) began



Trained staff at a plant clinic

Photo: Eric Boa

responding to farmers who requested identification of crop pests and diseases. CIAT identified the plant health problems in their small lab, and gave farmers a written report. This work inspired the development of the plant clinics. It was soon realised that the concept could be adapted to weekly farm fairs, and in 2003 a local Bolivian institution, Proinpa (Foundation for the Research and Promotion of Andean Products) set up a plant clinic every Friday morning in the market town of Tiraque. In 2005, various Nicaraguan institutions supported by Danida, including Funica, asked the GPC to help them create plant clinics in Nicaragua².

Bangladesh

This early work in Latin America gave the GPC a chance to create formal training in how to run a plant clinic. This was subsequently used to train clinic staff in several other countries. In an effort to improve farmers' access to information and services in Bangladesh, GPC advisors have teamed up with local partners; Rural Development Academy (RDA), the Agricultural Advisory Society (AAS) and the NGO Shushilan, to pilot innovative plant health clinics in the administrative union of Amrool, Bogra, and in the districts of Natore, and Satkira.

Serving the community

Based in the heart of the village, clinics are run on a regular basis so farmers have contact with trained plant doctors; a system analogous to district nurses holding clinics to promote human health. Each partner institution has its own style. With RDA clinics, women parish councillors elected by the community have been trained as plant doctors to run clinics for farmers in each village. AAS uses a variety of service providers already established in the community, and has trained enthusiastic volunteers to be plant doctors. Shushilan hired a social scientist to work with farmers and has re-opened its old soil testing laboratory. They hold fortnightly farmer meetings instead of clinics.

Clinics and plant doctors are supported



Rustam is an agrochemical dealer and a mobile plant doctor, regularly making field visits to 25 villages surrounding Amrool, covering over 10 km, and taking his mobile dispensary with him. He has printed his own note pad with RDA's contact details on it too. Business can be a community service.

Photo: Paula Kelly

by trained agronomists, who know that recommending control for plant health problems starts with a good diagnosis. Plant doctors have been taught to recognise key pests and diseases and to interpret symptoms using in-the-field training exercises. Their progress is appraised to ensure accuracy.

Pesticide reduction

Plant doctors encourage farmers to use appropriate levels of pesticide which, of course, is often no pesticide at all. Farmers often apply pesticides for viruses and other inappropriate causes. The plant doctors know that not all insects cause damage, and that applying an insecticide is ineffectual if fungi are the cause of the problem. Plant doctors are sympathetic to, and promote other technologies such as organic pesticides, and cultural and mechanical controls. In addition to the use of resistant varieties and collecting and destroying infested shoots and fruits to control *L. orbonalis*, plant doctors now recommend both biological control and pheromone traps since these are now commercially available in Bangladesh³. *Tricogramma evanescense* and *T. chilonis* are recommended to control *L. orbonalis* eggs and *Bracon habetor* are recommended to control larvae. Pheromone traps are also effective in the field, attracting male moths which are captured and killed without the need for extensive pesticide use. Reductions in pesticide use have not yet been quantified but is a topic for future research.

Additional costs are saved because the plant doctors are trained to recommend the appropriate application, timing and dosage of pesticides. Plant doctors write out prescriptions containing pesticide usage guidelines and other control recommendations, so that farmers know exactly what to do.

Large posters with colourful images posted in the clinics reinforce the message of using pesticides safely.

Aware of the risks of pesticide poisoning to human health, plant doctors have also asked for training in how to recognise signs of illness. This is particularly important in Bangladesh, as the WHO estimate that 55% of attempted suicides are by self-poisoning⁴ and that a large proportion of these fatal poisonings are pesticide ingestions⁵. The study suggests that many of these deaths could be prevented though the restriction of pesticides most harmful to humans, the safer storage of chemicals in rural communities, and better access to medical care. Plant doctors can help by recommending safe, approved chemicals and offering basic first aid to poison victims. Pesticide dealers also have a responsibility to ensure farmers' safety and improve services. RDA approves agrochemical dealers who they know are reliable. Rustam Ali, one RDA approved dealer, has learned many things from his association with the RDA clinic, and has attended many practical training sessions with the plant doctors. 'I knew that pests and diseases were harmful to the crops but now I have a better understanding of the damage they cause and what should be done about it. Training has opened my eyes'.

Other dealers in districts where the clinics are run are also beginning to benefit. They are receiving prescriptions from farmers, who now have the power to request pesticides which are safe and will work. One dealer in Bogra, Md. Hafizer Rahman, told us 'prescriptions are a good idea, because it is easy to dispense chemicals without having to think about the cause of the problem. Many times before I've made wrong recommendations to farmers'. He was keen to make amends by joining forces with the plant clinics. Pesticide dealers may be less likely to dispense an adulterated pesticide if a farmer gives a formal prescription.

Reaching out

All good plant doctors know that diagnosing symptoms of sick plants can be confusing, and their job is not always easy. Sometimes plant doctors see unfamiliar problems, but they are honest and admit if they cannot identify the problem. When this happens the agronomists are on hand to help collect plant specimens and refer them for analysis. RDA, AAS and Shushilan have their own informal links with various research organisations, and more formal support from the national government Department of Agricultural Extension (DAE). Overarching support is given from the Global Plant Clinic, which can receive plant samples and investigate the more complex enquiries. These links with the research organisations help clinics deliver up-to-date technical support to the farmer.

The clinics are being widely used. Every year RDA and AAS record more users. In the six months between September 2006 and February 2007, AAS's plant doc-



Farmers bring samples of failing crops to plant clinics

Photo: Paula Kelly

tors recorded visits from 3161 farmers, dispensing 2816 prescriptions through their 12 clinics in Natore. RDA recorded over 5475 farmers visiting the four rural plant clinics in Bogra over 12 months, and Shushilan's five farmer groups attracted 435 attendees in three months. This shows a great demand for these services in communities. Farmers even seek out the plant doctors out of hours. Mosamad Piyera from RDA's plant clinic tells us 'People in the village knock on my door and ask for advice even on days when the clinics aren't scheduled. If I do not know the answer I phone RDA, or make a special visit there so that I am able to tell the farmers what they should do'.

Start small get bigger

The clinics require some modest set-up costs as doctors require basic equipment and training. RDA plant doctors also require a shelter where they can run the clinics, although AAS already has these facilities. After the initial costs have been met, the running costs are low. Plant doctors receive a small allowance, paid for in RDA's case by the local council. Some costs are incurred through ongoing training, and analysing samples also requires resources. The diversity of clinics run in Bangladesh lends themselves to different models for scaling-up. RDA clinics are firmly based within local government. Mr Razibul Islam, the chairman of the local council, has made plant clinics central to the council's core development programme. He tells us: 'the plant clinics are a miracle and a useful innovation. We have never had anything like this in Bangladesh a doctor for plants! It will be very useful for our country, and it is beneficial for our Union'. Sponsorship of clinics by reputable companies could also be a possibility for the future.

The Bangladesh plant clinics and doctors can be seen on youtube at <http://www.youtube.com/watch?v=bBtZc-PUBBc&feature=related>

<http://www.youtube.com/watch?v=x14SFdaGsXQ&feature=related>

More information on the other GPC run clinics is on the research for development website www.research4development.info and in reference 6.

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Paula Kelly is the Co-ordinator of the CABI Global Plant Clinic. Phone +44141829069 or email plantclinic@cabi.org

Jeffery Bentley is an agricultural anthropologist and international consultant. Phone (00591) 7938-9455 or email jefferywbentley@hotmail.com

Harun-Ar-Rashid is the executive director of the Agricultural Advisory Society, and spends most of his time in the field. Email aas@bdcom.com

AKM Zakaria is the head of the agriculture science department at the Rural Development Academy, Bogra. Email rda_bg2003@yahoo.com

Mostafa Nuruzzaman is the executive director of Shushilan. Email Shushilan_ho@yahoo.com