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CARIBBEAN FOOD CROPS SOCIETY

46

**Forty Sixth
Annual Meeting 2010**

**Boca Chica, Dominican Republic
Vol. XLVI – Number 2
T-STAR Invasive Species Symposium**

PROCEEDINGS
OF THE
46th ANNUAL MEETING

Caribbean Food Crops Society
46th Annual Meeting
July 11-17, 2010

Hotel Oasis Hamaca
Boca Chica, Dominican Republic

“Protected agriculture: a technological option for competitiveness of the Caribbean”

“Agricultura bajo ambiente protegido: una opción tecnológica para la competitividad en el Caribe”

“Agriculture sous ambiance protégée: une option technologique pour la compétitivité de las Caraïbe”

**United States Department of Agriculture,
T-STAR Sponsored Invasive Species Symposium**

**Toward a Collective Safeguarding System for the Greater Caribbean Region:
Assessing Accomplishments since the first Symposium in Grenada (2003)
and Coping with Current Threats to the Region**

**Special Symposium Edition
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PLANTWISE: A GLOBAL PLANT HEALTH ALLIANCE

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ABSTRACT: At the beginning of 2010, the international science-based development organization CABI announced the launch of its Plantwise initiative, a major program to create a global plant health information resource and surveillance system, aimed at benefiting scientists, policymakers, and farmers. Central to the Plantwise concept is a ‘knowledge bank’ delivering a single point of access for all plant pest and disease information. The plan is to bring together all the best information about plant pests and diseases, aggregate it, structure it, update it, and make it searchable so that scientists can recognize complex patterns of information across multiple sites. CABI itself has a number of pieces of the jigsaw already in place, in the form of its existing data and publishing capability, including CAB Abstracts and the Crop Protection Compendium (CPC), together with its network of plant health clinics.

The plant health clinics advise farmers in developing countries on pests and diseases in the way a health center does for humans. They are run by local technical people, trained by CABI, who visit rural markets every week. Farmers drop by with samples of diseased plants, to get the problem identified and to learn what to do about it. CABI is actively expanding the number of clinics to 400 in 40 countries by 2015. As well as providing immediate benefits to local farmers, the clinics are becoming a most effective field-based early warning system, helping to monitor plant pests and diseases and indicate where more systematic surveillance programmes are required.

The clinics provide regular new disease reports. Indeed, since the first clinic was created in 2002, a total of 47 new diseases have been confirmed. With more than ten times the current number of clinics in operation, we will expect much greater reporting of emerging problems which can then be digitized and laid on a map. Over time, we will be able to track the distribution and incidence of each pest or disease while plant scientists, armed with current and reliable reports, can get a grip on what really is going on and recommend timely mitigation strategies.

Through Plantwise, CABI will also be able to present linked references to articles about specific pests, the crops they affect, the damage they cause, and suggested treatment. The current prototype allows users to search by crop, by pest, by country, or even by soil type. The knowledge bank will also contain images for identification of pests, description of their relationship with the plant host, and contact details of local services.

Plantwise is a collaborative initiative. As well as donors, CABI is seeking both institutions and individuals to provide shared content and to help review the knowledge bank as it develops. (Contact Phil Abrahams [p.abrahams@cabi.org] to find out more about Plantwise.)

INTRODUCTION

It is estimated that at least 40% of all crops are lost pre- and post-harvest through pests and diseases, poor cultivation, harvesting and storage practices (Oerke and Dehne 2004). The need to address global food security through rural development is at the core of CABI's Plantwise initiative. By helping farmers lose less of what they already produce to pests and diseases, the incomes of subsistence farmers can be raised to enable them to better provide for their families while significantly contributing to the food baskets of their countries.

The Plantwise initiative will be driven by a significant expansion of CABI's Global Plant Clinic operation, working at country level with plant science organizations, agricultural ministries, and extension systems to create a sustainable local plant healthcare system. CABI will train plant doctors to diagnose and offer practical treatment advice to farmers, free at the point of use, through regular plant health clinics held wherever farmers meet. Figure 1: shows where plant clinics are currently operating in the globe.

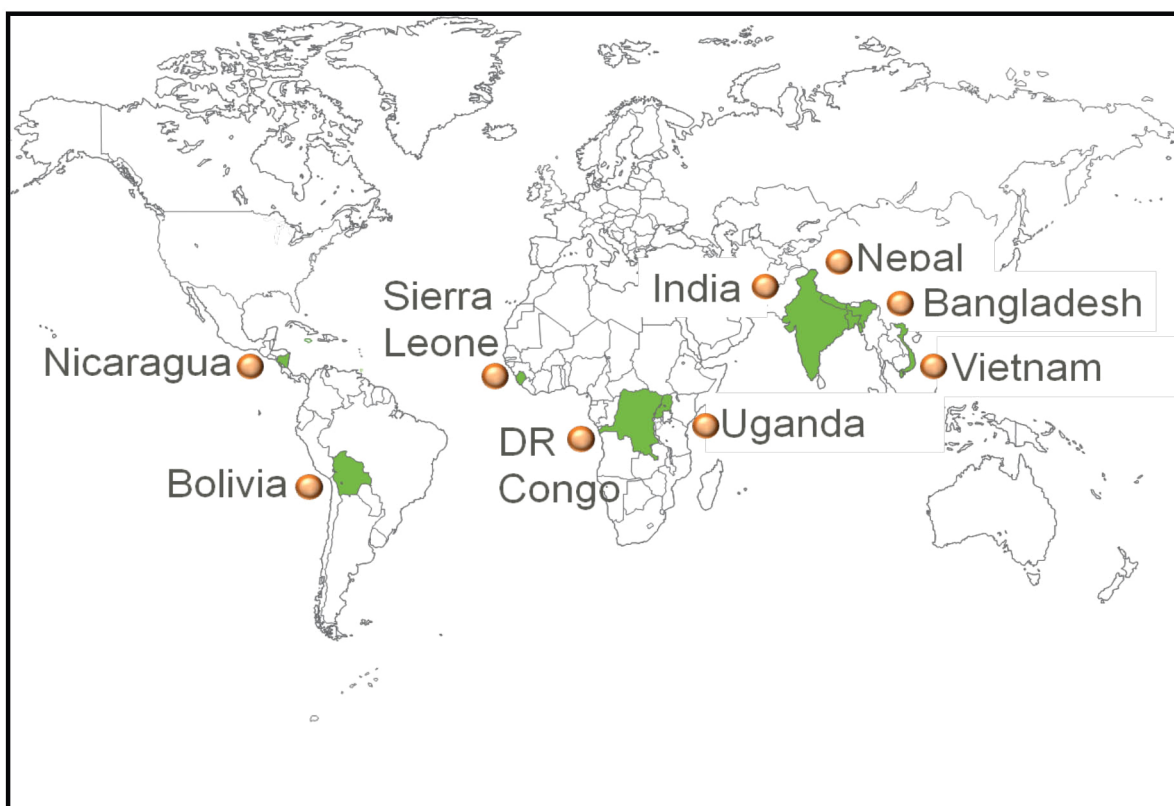


Figure 1. Countries where 80 CABI Plant Clinics are currently operational.

In 2010, new clinics were established in Afghanistan, Kenya, Pakistan, Peru, Rwanda, Sri Lanka, and Suriname. Worldwide, CABI plans to expand from the current 80+ rural clinics, to over 400 clinics in 40 countries by 2015.

Plant Clinics and CABI's Global Plant Clinic Operation

The Global Plant Clinic (GPC) is managed by CABI in alliance with Rothamsted Research and the Central Science Laboratory. The GPC delivers plant health services around the world, working with extension, research, the private sector, and governments to make technical support and advice available through plant health clinics. We train plant doctors and scientists, link

extension to research and promote new ways to give poor farmers access to the best technologies. Training courses strengthen capacity and foster innovation needed to run regular clinics. Each year the GPC receives queries from over 80 countries, publishes on sustainable management of new diseases, extension materials and supports more than 80 clinics in the poorest countries of Africa, Asia, and Latin America.

The GPC's model of plant health clinics held in markets (Figure 2) or rural areas could be a valuable addition to pre-existing extension services, as plant health advice would be opened up to many more people in a convenient and accessible way. These public or mobile plant health clinics are not meant to be replacements for university or Ministry clinics, but actually to work alongside them; not everything can be diagnosed in the field or in these clinics, especially viruses and phytoplasmas, and the diagnostic skills and equipment at lab-based clinics are therefore essential. Where public clinics and lab-based clinics operate successfully together, as in Latin America, there is an increase in the number of cases and queries coming through the traditional lab-based clinics. There is also increased intelligence about pests and diseases, including new threats, fed through to the government plant health statutory services which can assist quarantine and timely research projects (i.e., a potential source of new research funding for universities).



Figure 2. 'The doctors are in office': Plant doctors in action at Plant Clinic in the marketplace in Nepal.

Plant doctors are trained by CABI through a series of GPC modules, with a minimum of three required to become a plant doctor. The plant doctors help farmers to correctly diagnose their crop disease problems backed by CABI diagnostic labs and partners who can apply their entomology, pathology, and virology skills to help diagnose the problems found in the field. The plant doctors are thus able to make recommendations to the farmer on corrective actions and appropriate use of pesticides and fungicides to control their disease problems.

One of the major problems encountered thus far by plant doctors is over-use and incorrect use of pesticides which hurts both the farmers' pockets and the environment: pesticides are not cheap and over-application is unnecessary and leads to resistance in the pests and diseases they are supposed to control. It is not surprising that farmers complain to us in the clinics that despite pesticide application, the target pests and diseases are not being controlled.

As with any doctor the more experience gained through practice and constant dialogue with scientists at diagnostic labs, the fewer mistakes are made. When mistakes do occur, they are usually minor and rarely damaging, and the advice from trainee plant doctors is better than some of the current practices, eg using fungicides to control insect pests (Kelly et al. 2008). The key to success has been to mentor and coordinate a willing and capable triumvirate (doctor, laboratory, treatment supplier) of partners who, when brought together, can deliver effective and practical answers to a farmer, while at the same time generating insights into new and existing pest and disease incidences (Danielsen and Kelly 2010)

Results thus far from Plant Health Clinics are impressive and immediate: a recent impact assessment has shown farmers in Bolivia benefitting by \$4/day with increased production by 25% from the plant doctors' advice, raising individuals from subsistence levels, helping farmers earn enough to provide for family healthcare and keep their children in school.

Additional benefits resulting from the Plant Health Clinics are adoption of practical agricultural methods to reduce crop losses, improved nutritional and economic value of crops grown, gender outreach (clinics are heavily attended by female smallholder farmers), more appropriate use of chemical inputs (pesticides and fertilizers), and generation of micro-enterprises. The final element of a plant health system is input supply. Work in Nicaragua with plant pharmacies (mini-enterprises that extend the availability of less toxic pesticides and alternative control methods) and eco-friendly dealers in Bangladesh linked to clinics provide a broad template for similar schemes in other countries.

Beyond Plant Clinics and Plant Doctors Plantwise

By feeding the observations from over 400 clinics into a knowledge bank on a real-time basis, CABI can, over time, create a global bio-security vigilance system, enabling pest risk forecasts to drive mitigation and adaptation planning in advance of outbreaks. Today, there is no global pest and disease database and CABI will therefore facilitate the creation of a unique warning system to highlight future research priorities and to guard against future crop losses.

This comprehensive global knowledge bank will bring together the best worldwide data on crops, pests and diseases, underpinned by CABI's existing collection of the world's most extensive and trusted agricultural content. This will be further augmented with open access data from authoritative partners, including the FAO, IPPC, and various national plant protection organisations, research project findings, book content, and SPS legislative information. At the most basic level, this aggregation of data resources into a single site will save time for regulatory

staff, researchers, and extension workers who need access to such information on a regular basis. The knowledge bank will form a valuable repository within which simple fact sheets, pest descriptions, images, and farmer information manuals can be archived and made readily accessible free of charge to a global audience—providing immediate benefits to farmers and extension workers. This is the goal of Plantwise (Figure 3).

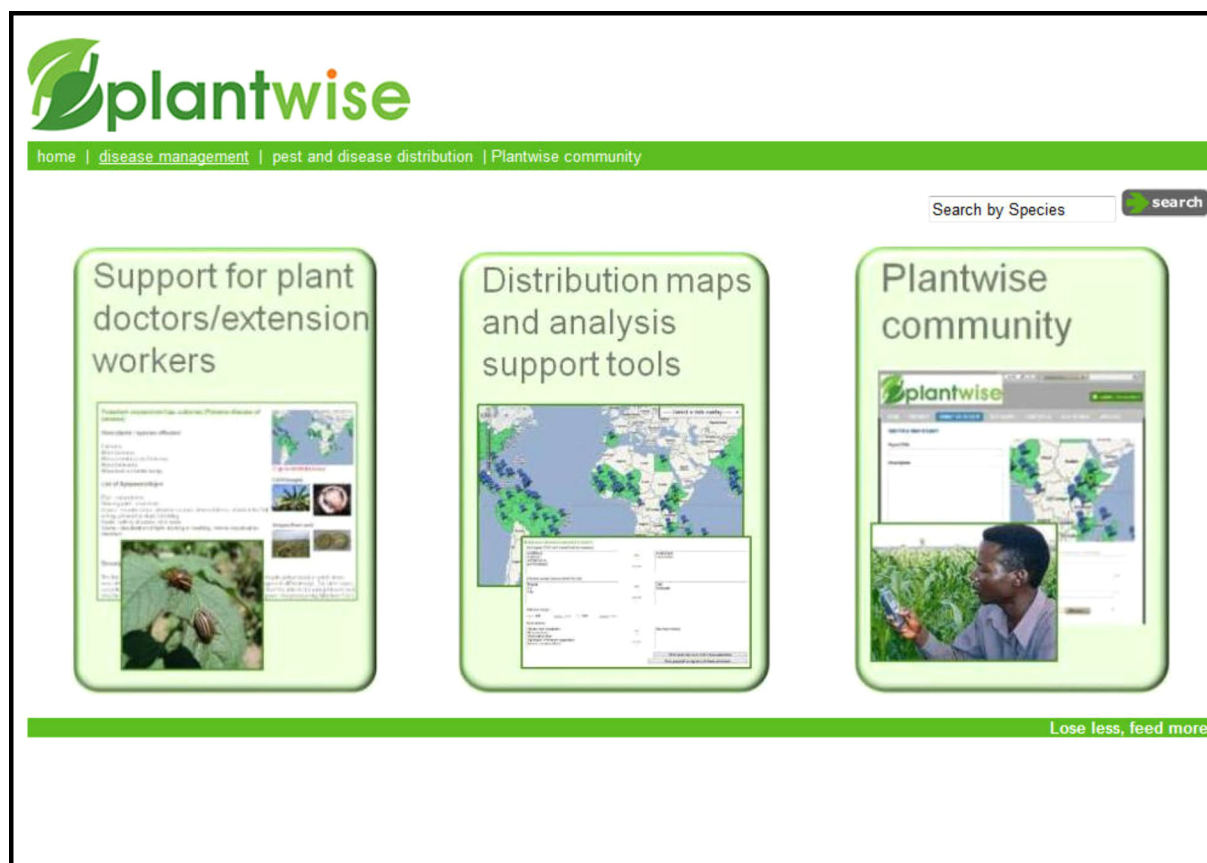


Figure 3. The Plantwise brand and internet home page.

The Plantwise prototype is now live on the internet and can be accessed at <http://www.plantwise.org>. This resource is designed to answer important questions relating to plant pest and disease occurrence worldwide. With distribution data on over 3,000 pests and diseases, and related geographical data such as climate and soil, Plantwise can help people make scientifically informed decisions about crops, management, and pest risk.

The prototype is focused initially on building detailed information on a limited number of crops (coffee, cocoa, cotton, palm oil, rice, wheat, maize, sunflower, pepper, and banana) relevant to Global Plant Health Clinics, with features such as pest distribution data (general location) displayed on a clickable map (Figure 4), verified quality data, incidence levels (basic), images, pest information sheets, and pest risk analysis tools (basic). Features such as images and pest information sheets will be updated as information becomes available.

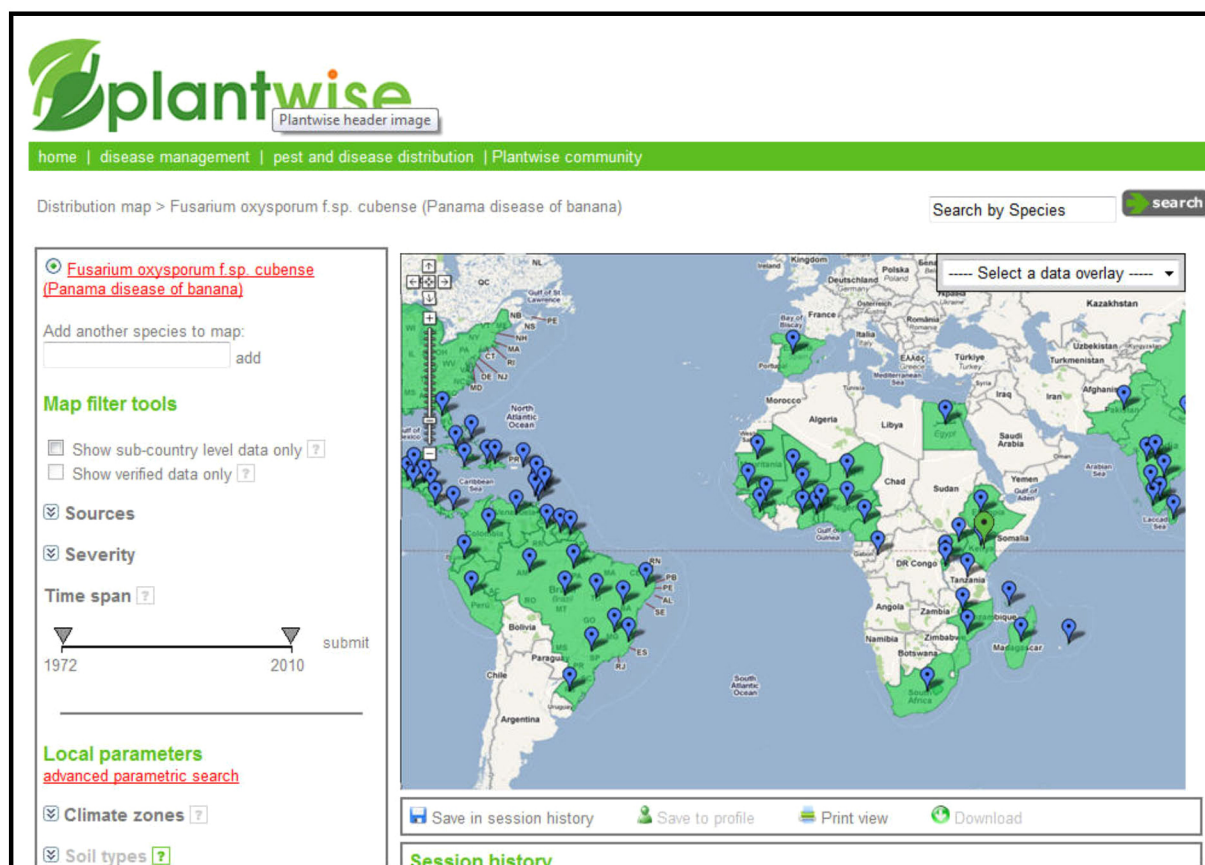


Figure 4. Plantwise distribution map for Panama disease of Banana.

Development of the knowledge bank and expansion of the plant doctor schemes is predicted to take five years to reach maturity. CABI itself is already making significant investment in the roll-out of the clinic network and in developing the knowledge bank. In the long term, we anticipate that this system will be financially self-sustaining through national government support, fees for training services, sponsorship and commercial subscriptions.

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