



PlantWise: A Global Plant Health Alliance

Elizabeth Johnson – CABI-CLA

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www.cabi.org

KNOWLEDGE FOR LIFE



The World Today

- Against a background of
 - ~1.02 billion people going hungry
 - 13,000 children under 5yr dying each day through malnutrition
- Up to 40% of the food we grow is lost to pests and diseases
- **Reducing this to 39% could feed up to 25m more per day**



In the future: maelstrom vs. vacuum?

Increased pressure on food production from:

- Trade and travel; Climate change; Water & energy scarcity; Population increases....*leading to:*
- John Beddington's "Perfect Storm".....*meanwhile:*
- "Insect vectors, pests and diseases are moving extremely fast and we have frankly no grip whatsoever over what they might do in the next 20/30 years."

Janice Jiggins, Wageningen University

Pest and disease threats: simple insights

Food & economic security

- 19% of the world's wheat, which provides food for 1 billion people in Asia and Africa, is in imminent danger from Ug99 (wheat rust). CIMMYT
- Rice is a staple for about half the world's population, but we lose 10%-30% of the crop to blast disease
- Stem damage diseases to banana and plantain crops could cause losses of up to \$4Bn in 2010 FAO

Farmers are simply seeking solutions

Researchers are “simply” seeking distribution data, linked to ground-based evidence

Member country commitment to KM: “Make something happen”



Users want agri-info organised

- But, pest data has problems -
 - Dispersed/uncoordinated, poorly-maintained, non-specific in nature, of variable quality, and very general geo details
- Hugely expensive time investment
- No means of evaluating risk – human, \$, R&D ROI
- SPS legislative information is poorly maintained
- Give me
 - a single site I can trust
 - current and interrogative data
 - timely and accurate pest risk assessments
 - predictive alerts – what is likely to happen, and when

What is required? User feedback

- Time saving
- Where are the pests now?
- Where are they going?
- Granularity
- Evidence/references - trust
- Accurate quarantine info
- Images – but structured
- Diagnostic expertise, quality-assured
- Risk quantification
- Consolidated & holistic info
- History
- Multiple platforms
- Reliable analysis on tap
- Networked experts
- Assessments, triage & policy advice

Our vision

Plant
doctors



Develop a plant health resource for all capable of supplying an early warning surveillance system for plant health

CABI data



Top-Down: Informing the Farmer
Working with an alliance of partners, provide knowledge at locally run plant clinics in the developing world and internationally through a comprehensive plant health resource

International
data from
partners



Bottom-Up: Utilise local Observations
Real-time distribution and reportage

Our Vision



reduced **losses**
increased **income**
improved **livelihoods**
improved **food security**

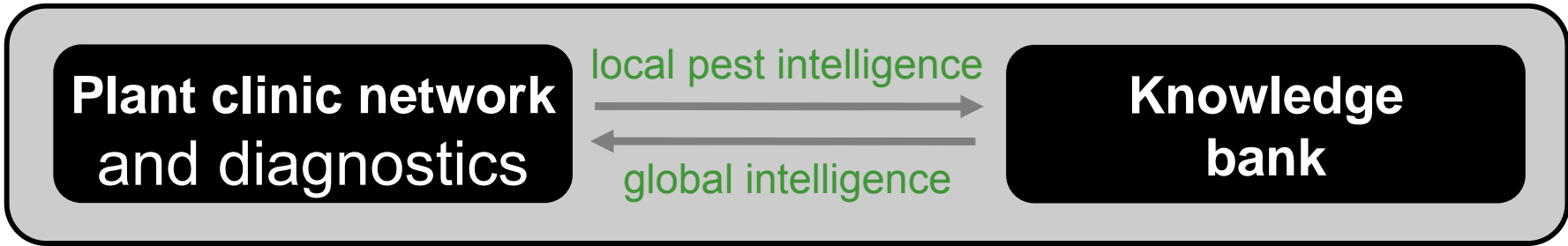
Developing country
farmers

improved **vigilance**
improved **pest risk analysis**
improved **product development**
improved **food security**

Governments,
scientists and corporates

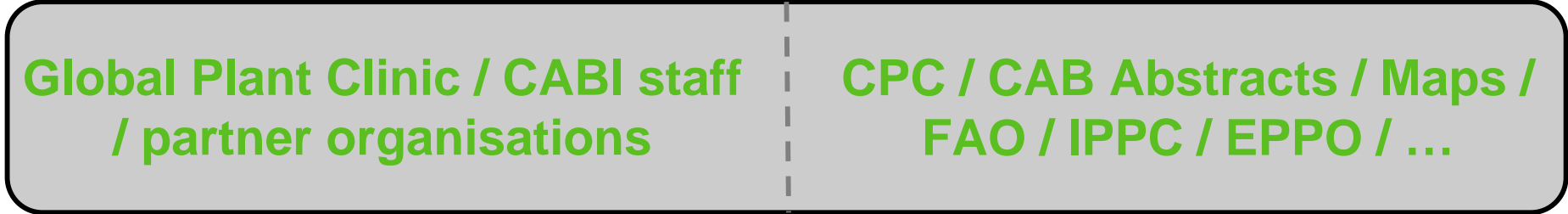
advice ↑ ↓ pest intelligence

↑ local, national and
global intelligence




upscale plant clinic programme to
400+ clinics in 40+ countries

comprehensive interactive database
with pin-point accurate pest mapping
system





plantwise


Search by pest, crop, region 

[Advanced search](#)

Welcome to version 0.1 of the Plantwise knowledge base – the resource 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 helps you to make scientifically-informed decision about crops, management, and pest risk.

Beta v 0.2 in progress- updates include addition of FARA data, and severity level indicators in map tool. [Click here for details and to feedback.](#)

Diagnosis / management



Taxonomic Tree

- Domain: Eukaryota
- Kingdom: Plantae
- Phylum: Spermaphyta
- Subphylum: Angiospermae
- Class: Dicotyledonae
- Order: Malvales
- Family: Malvaceae
- Genus: *Abutilon*
- Species: *Abutilon theophrasti*

Notes on Taxonomy and Nomenclature

Mitch (1991) reports the nomenclatural history of *A. theophrasti*. Ca as *Sida abutilon*. Its genus companions included such plants as *Sida Medicus*, director of the garden at Mannheim, published a volume in placing *Sida abutilon* in the genus *Abutilon* with the specific epithet I reclassified the plant as *Abutilon avicennae*, but scientific precedenc: was restored.

The common names include several names meaning a kind of juke or *A. theophrasti* as a fibre crop; for example, 'ma' of 'ching-ma' and th

Description


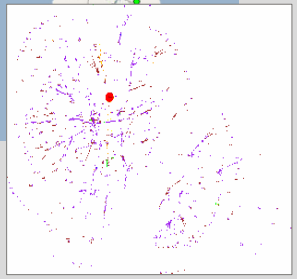
Abutilon theophrasti is an annual herb, reproducing only by seed. At elongates into soil with many smaller branches. The stem is erect, 1

Core data


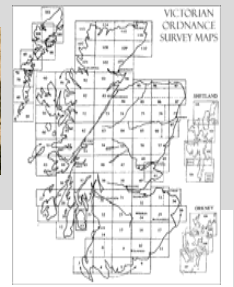
Country	Distribution	First Reported	Origin	Pest Reported	Status	Reference
ASIA						
China	Present, no further details		Native		Not invasive	Wood 1992; USDA-ARS 2003
India	Present, no further details		Native			USDA-ARS 2003
Laos	Present, no further details		Native			USDA-ARS 2003
Nepal	Present, no further details		Native		Not invasive	Wood 1992
Iran	Present, no further details		Native			Faust 1977
Israel	Present, no further details		Native			Wood 1992

Country	Cultures	Other	Total	Cultures	Other	Total	Cultures	Other	Total
NEC	525	163	156	1046	125	250	857	127	212
CA	643	89	153	1241	110	236	1029	111	214
LA-PHX	400	50	90	868	56	143	700	56	126
DAL-HOU	219	26	48	519	34	86	417	34	75
LA-LV	302	42	72	658	47	113	531	47	100
TEX-FRI	545	70	124	1297	84	214	1041	84	189
SEC	526	70	123	1155	81	197	931	83	176
CHI-PIT	558	76	132	1210	88	209	975	88	185
CHI-MSP	404	54	94	877	62	150	706	62	133
CHI-DET	277	34	61	657	44	110	527	44	97
CHI-KC	515	67	119	1118	77	184	902	77	167

Analysis tools

Pest occurrence




Date:
Country:
City/county/region:
Pest/disease:
Host crop:
Severity:
Upload image:
Recommended management

[Advanced search](#)

Distribution info:



[Example Pest \(common\)](#)

Scientific name

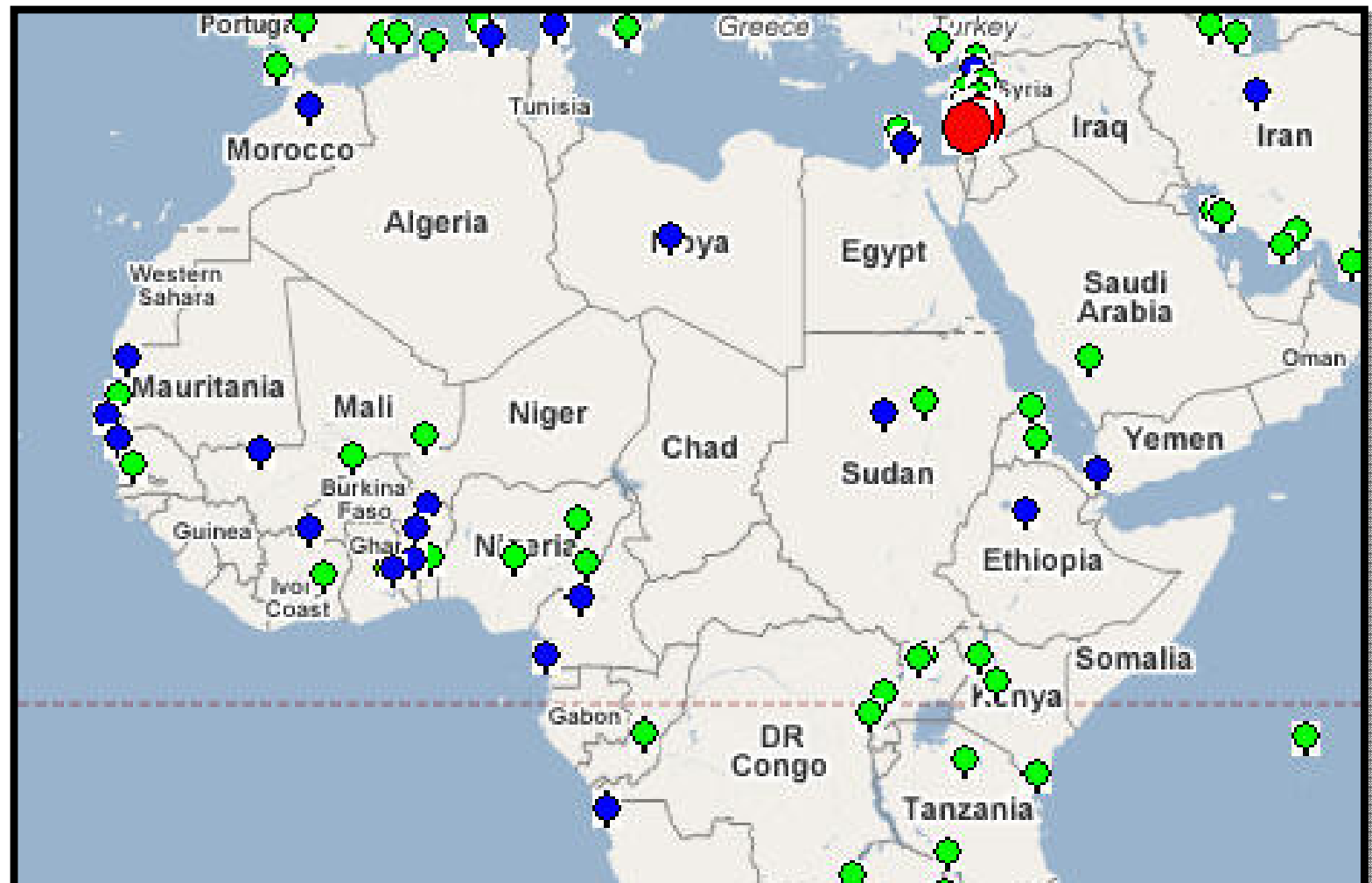
-  CABI data
-  FERA data
-  Plantwise clinics data

[A-Z of all pests/diseases](#)

Layer with:

-  Climate data
-  Soil data

Example Pest : world

[Report incident](#) [Download data](#)

Building a centralised plant health resource

- Detailed information on 2,500 diseases, pests and crops
- 28,000 additional reports
- 6,000 images
- 1700 distribution maps
- Data from 8m CAB Abstracts
- *Plus, critically:*
 - **Geo-specific observations (Clinics)**
 - **Authoritative partner content**



“The benefit to Australia from using The Crop Protection Compendium is up to \$1.4m per year.”
Peter Core, Director, ACIAR



Making this more than CABI, or the Crop Protection Compendium

	Govt, NPPO, Regulatory	Commercial: Chemical/ food supply	Commercial: Risk analysis /insurance	Farmers & Extension	Academic
Pest distribution data	Green	Green	Green	Green with grid	Green
GIS granularity	Green	Green	Green with grid	White	Green
Verification: rate of incidence	Green	Green	Green	White	Green
Verification: age of data	Green	Green	Green with grid	White	Green
Risk: Pest yield impact (%)	Green	Green	White	Green	Green with grid
Risk: Pest commercial value impact (\$)	Green	Green	Green	White	White
SPS legislation	Green	Green	White	Green	White
Historic data sets	White	Green	Green	White	White
Pest risk analysis – long term	Green	Green	Green	White	Green
Pest risk analysis – short term	Green with grid	Green	White	Green	White
Best practice	Green	White	White	Green	White
Pesticide take-up and residues	White	Green	White	Green with grid	White
Treatment advice	Green	White	White	Green	White
Predictive forecasts	Green	Green	Green	White	White
Pest alerts	Green	Green	Green	Green	White
Alert interpretations	Green	Green	Green	White	White
Modelling	Green	Green	Green	White	Green with grid
Weather data	Green	Green	Green	Green	Green with grid
Descriptions and images	Green	Green	Green with grid	Green	Green

Free clinics are set up at local meeting places such as markets.

Farmers bring a sample into the plant clinic.

They receive a 'prescription' from the plant doctor.

Doctors are trained: surveillance and diagnostic techniques, IPM, technology development, pesticide use and reduction, markets, government policy, risk reduction, marketing, business skills and post-harvest care

How the clinics work



Information and Knowledge Management thru on the ground Training





- Bolivia
- Bangladesh
- Congo
- Perú
- Nicaragua
- Vietnam
- Sierra Leone

Extension Pamphlets to Disseminate new information



FACT SHEETS FOR FARMERS | INDIA

Root knot nematode on tomato

Fact Sheet

1

Attack below, damage above

Tomato roots are attacked by nematodes, reducing growth of the plant and yields. The symptoms above ground are similar to other diseases. Confirm nematode attack by examining the roots.

How the plant is affected

Nematodes or *Jantu hula* are small worms which live in the soil, and cannot be seen with the naked eye. They can persist for many years, even after the infected plant has been removed. Nursery soil is a common source of nematodes.

How to recognize tomato nematode:

- distinctive swellings or knots on the roots
- the plant is stunted (it cannot absorb enough food)
- leaves go yellow and die

Nematodes attack many plants. Knots are often confused with nodules found on the roots of crops such as cowpea and bean. These nodules help the plant to grow.



► Examine the roots to see if they are swollen. The yellow arrows show knots caused by nematode infections.

Management

Pseudomonas fluorescens is a natural control method. SU-MONAS is one example of a commercial preparation. When applied to the soil it helps tomato plants fight nematodes. Treat nursery soil to prevent transfer of nematodes to fields.

- In the nursery apply SU-MONAS at 50 grams per square metre of soil.
- In case of infected seedlings, broadcast the field with well decomposed farmyard manure (1 ton per acre) enriched by SU-MONAS at 2 kilograms per 100 kilograms of farmyard manure. Apply this treatment before you transplant the seedlings.
- Intercrop every 25 rows of tomato with one row of marigold. Their root juices kill nematodes.
- Ensure good drainage after irrigation by keeping the ridge height of the seedling bed up to 8-10 inches.
- Do not plant tomatoes continuously. Rotate every six months with fodder crops such as sorghum which are not attacked by nematodes.

Chemical control of nematodes in the soil is available but expensive.

Anusha Babbar • Rekha Powar • Malvika Chaudhary

ADDRESS: BCRL, PB 6426, Yelahanka PO, Bangalore 64
TEL: 080 28468839/43 EMAIL: bcr.l.fee@pci.in



Edited by Eric Boa
GLOBAL PLANT CLINIC
Healthy plants for
healthy people

FACT SHEETS FOR FARMERS | INDIA

Yellow stem borer on paddy

Fact Sheet

2

Number one enemy

Yellow stem borer is the most damaging insect on paddy. It feeds inside the plant. Stems become dry and hollow and no grains are produced. The dried stems can be pulled out easily and are called dead hearts. The empty grains are known as white ears and detach easily.

Insect damage

The insect has two different forms. The adult insect is usually a yellowish moth with a black dot on each wing and has a pointed mouth. The adults visit the fields in the evening. The young larvae or worms are found inside the stem and are off white with a red head and no visible legs.

The larva is thin with a rough surface and looks like a small tube. They cause much damage by boring into the stem and eating the plant. Only one larva is found in each stem although several stems can be affected.

Management

There are no resistant varieties of rice and chemical sprays are not effective once the larvae are hidden inside in the stem.

Early treatment of young plants helps to reduce damage in fields. In raised beds of seedlings spread *CartebHCL 10G* evenly. This is an approved granular insecticide that dissolves in water and remains within the plant. A raised bed of one foot by 10 feet will need around 13 grams of *CartebHCL 10G*.

After transplanting seedlings, and within 10 days, place pheromone dispensers containing sex pheromone tablets in the paddy field. These will attract adult moths and reduce populations of larvae. Place 32 dispensers per acre, evenly spaced. These should remain in the field till harvest. There is no need to replace the tablets during this time.



► Above: Young insect (larva). Below: Adult moths normally appear more yellow. (photos Merie Shepard, CPC)



► Pheromone dispensers on sticks

C Chandramohan • S R Ingle • Ramana Murthy

ADDRESS: BCRL, PB 6426, Yelahanka PO, Bangalore 64
TEL: 080 28468839/43 EMAIL: bcr.l.fee@pci.in



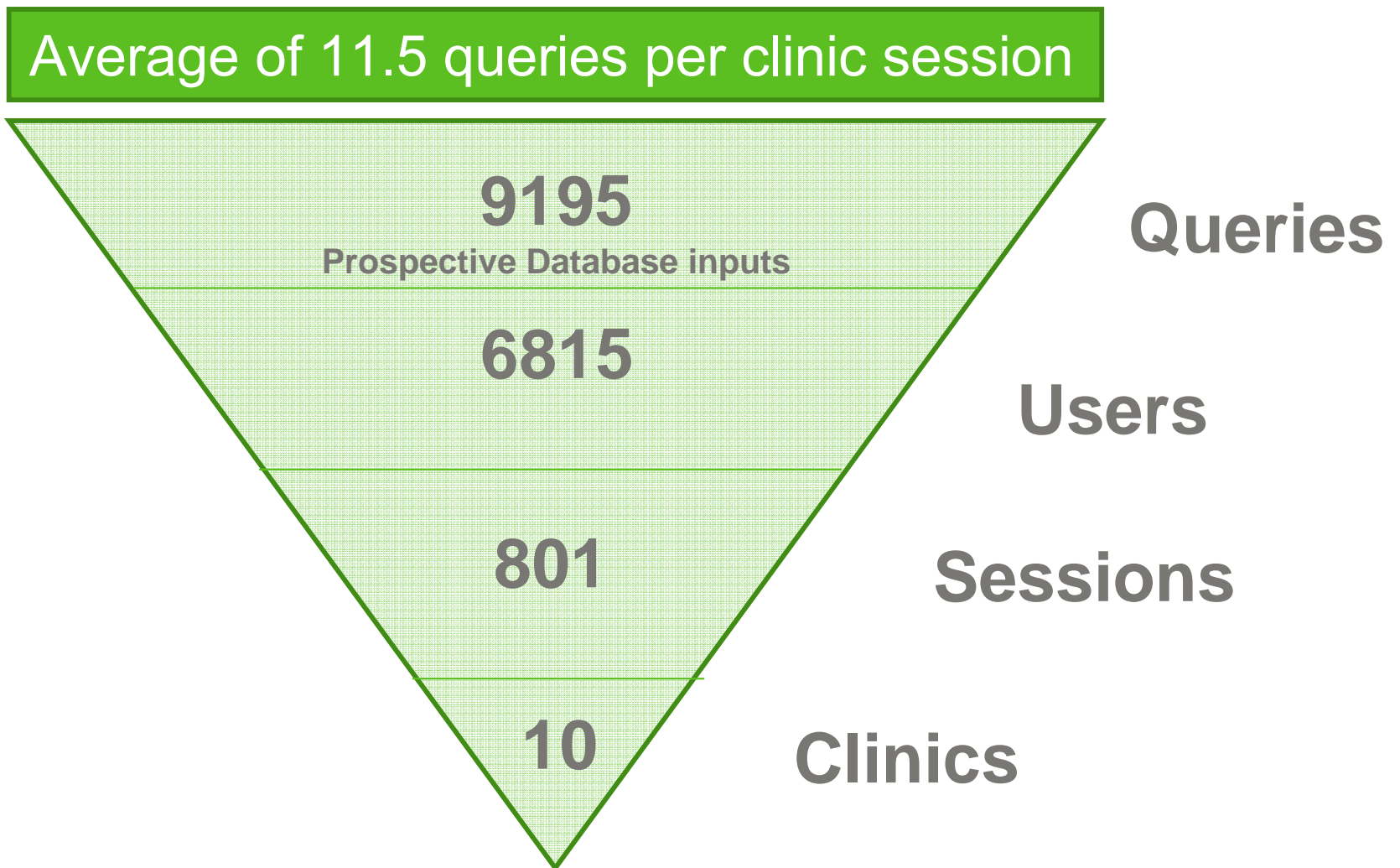
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GLOBAL PLANT CLINIC
Healthy plants for
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Clinic programme progress

New countries	Status	Existing schemes	Status
Kenya	Workshop Kick-off; Kitali pilot	Sierra Leone	12 regional & 50 satellite clinics
Pakistan	Workshop July	Bangladesh	New impact study
Peru	NPPO likely to resource	Uganda	Official Govt policy adoption
Rwanda	Set up planned September 2010	Vietnam	Plan to expand to 5 clinics
Sri Lanka	3 rd clinic commenced with partner	India	Partner impact study; pilot w/ Karnataka State Dept Agriculture
(Afghanistan)	Aga Khan possible funding	Bolivia	Expansion planning September
China	Joint Pilot proposed w/ NATESC, Hainan Province	Nicaragua	Expansion planning August

Clinics have broad reach....

Bolivia (Feb 00 – April 09)



... and significant impact Bolivian tomato farmers

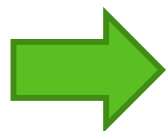
- Adoption rate = 88%
- Input cost reduction = 34%
- Yield increase = 142%
- Income growth = 100X
(+ \$4/day)



Faustino Benavides
Began spraying the
right pesticides more
accurately and his
tomato harvest
increased by 25%.

Global surveillance: data gathering points 2010 to 2014

- Currently 9 countries, 80 clinics
- Building to 40 country schemes
- 10+ clinics/country
- >400 clinics feeding plant pest geo-positioned observations



Rich insight into what's happening where

A group of approximately ten young children, mostly of African descent, are gathered together. They are all smiling and looking towards the camera. In the center, a large bunch of green, unripe bananas is being held. The children are wearing simple, everyday clothing. The background is slightly blurred, suggesting an outdoor setting.

Work with us: Give us....

- Your feedback
- Your input and ideas
- Your recommended content/partnerships

All are vital to help us make this initiative a reality

Lose Less – Feed More

To take part, or for further information

Trevor Nicholls, CABI CEO

T: +44 1491 829215

E: t.nicholls@cabi.org

Phil Abrahams, Programme Manager

T: +44 1491 829374

E: p.abrahams@cabi.org