A “big data” initiative from CABI
40% lost to pests and diseases

1% less = 25 Million more fed

Lose less, Feed more.
Plant clinics

- Capturing observations about the presence or absence of plant pests
- Recording advice given and intelligence received
Data Gathering

- Structured reports from Plant Doctors
- Data uploaded via scanners
- Central repository set up to ingest data on a global scale
Data gathered at clinics is recorded and uploaded to a central repository.
Clinic data is then blended with data harvested from other sources -
- CABI publications
- Third party information

to extract data points relating to the location of plants and the pests and diseases that damage them at a given time,

which are then stored for further manipulation in the Plantwise Knowledge Bank.
Empowering farmers, powering research - delivering improved food security
Data Validation

- All data points come with an audit trail allowing users to validate their origin and authority.
- Links into CAB Abstracts and onward to published research articles.
- Data visualisation adds value to the original research and creates new insights.
Knowledge bank

Plantwise Kenya

Pest Management

Recently added factsheets for Kenya
- Aflatoxins in maize
- Soap controls aphids in beans
- Coffee wilt disease
- Preventing coffee wilt disease
- Fusarium wilt of banana

See all factsheets for Kenya...

Common pests being seen in Kenya
- Coffee
  - Coffee berry disease
  - Coffee leaf rust
- Banana/plantain
  - banana weevil
  - Panama disease of banana
- Maize
  - African maize stalk borer
  - Maize streak virus

Go to full pest list...

Clinic & Partners

Find a factsheet

Enter pest problem or crop here
Search factsheets

Go to treatment support page...

Identify a pest problem

Crops
- Please select a crop...
Part of plant being affected
- Select a plant part--

See results

Go to full diagnostic search...

Supporting Plant Clinics

Diagnostic tools

Access to region-specific treatment advice
Embedded into workflows
Combined with other global datasets
Big Data

+ Analysis tools

+ Human knowledge

= Very interesting things…
Predictive pest maps

Coffee wilt distribution data + World soils database =

Reports about the lifestyle of the pest species based on where it has been found.

Distribution data for any pest species

Geospatial data for any location
Based on soil profile, where could Coffee Wilt Disease make its next appearance?
Pest risk indexing

- Group countries by shared pests.
- If a pest is ‘missing’ from a country, but present in the other countries of the group, then there’s a predicted risk of invasion.

Cluster Ib2 mainly pests from EPPO countries

Analysis of 844 invertebrate crop pest species (Worner and Gevrey 2006)
...combine with pathway data, or trade routes

Pest risk index
Plant clinic analytics

- Where do the farmers come from?
- What is the gender balance?
- Are there seasonal variations?
- Are some clinics more popular than others, and why?
- How far will people travel to visit a clinic?
- Which crops are brought in most frequently?
- Is the advice taken, and what is the impact achieved?
Technical stuff

• Very big relational database (SQL)
• Modular architecture to enable future extension
• Data-type repositories (e.g. images) to ensure most appropriate management of content
• 3rd party APIs with various partners
Semantic tagging

• All terms and concepts controlled and validated by CAB Thesaurus
• 130,000 terms and phrases, specific to agriculture and related disciplines
• Essential to ensure consistency, discoverability and reliability
• Breathing new life into a long-standing CABI asset
Business model

- Major fund-raising campaign has already secured $30m for the whole Plantwise initiative
- The Plantwise Knowledge Bank will be an Open Access resource
- CABI will create value-added products and services for commercial sale
- Potential users range from academic researchers to quarantine officers and supply chain logisticians
Time’s Up!

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