



A “big data” initiative from CABI



40% lost

to pests and
diseases

1% less =

25 Million more fed

Lose less, Feed more.

STM



The logo for 'plantwise' features a stylized green leaf icon on the left, followed by the word 'plantwise' in a bold, green, lowercase sans-serif font. The dot above the 'i' is orange.



**Global food
insecurity**



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

Select a species:

Acanthiophilus helianthi (150 recs)

Update Map

Or, enter a species name:

Update Map

Map filter tools

Sources

- Distribution Maps of Plant Pest & Diseases (2003-present) (61 recs) [?](#)
- Plantwise Plant Clinics (0 recs) [?](#)
- National Biodiversity Network (UK Only) (22 recs) [?](#)
- CAB Abstracts Text Mining (0 recs) [?](#)
- Crop Protection Compendium (67 recs) [?](#)
- CABI Projects Data (0 recs) [?](#)
- International Center for Tropical Agriculture (0 recs) [?](#)

Update Map

Add a base layer [?](#)

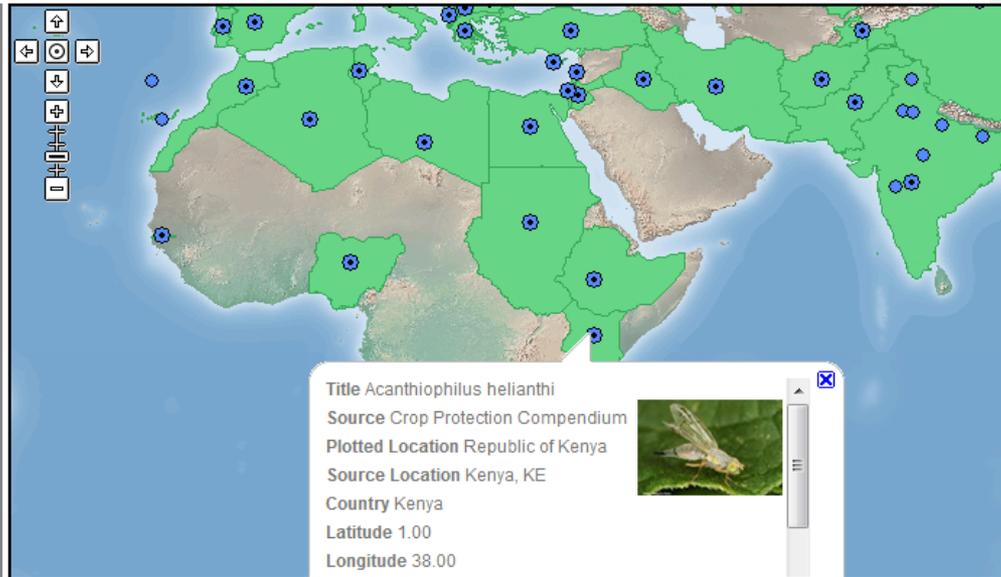
No base layer

Update Map

Advanced filter options [?](#)

- Köppen-Geiger Climate Zones
- Soil Data
- Land Use
- Country Outlines

Apply filter



Pest report at country level Pest report at sub-country level

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

The screenshot displays the Plantwise Kenya website interface. At the top left is the Plantwise Kenya logo with the Kenyan flag. Below it are links for "Plantwise Clinics Login" and "Change Country". A green navigation bar contains "Pest Management". The main content area is divided into several sections:

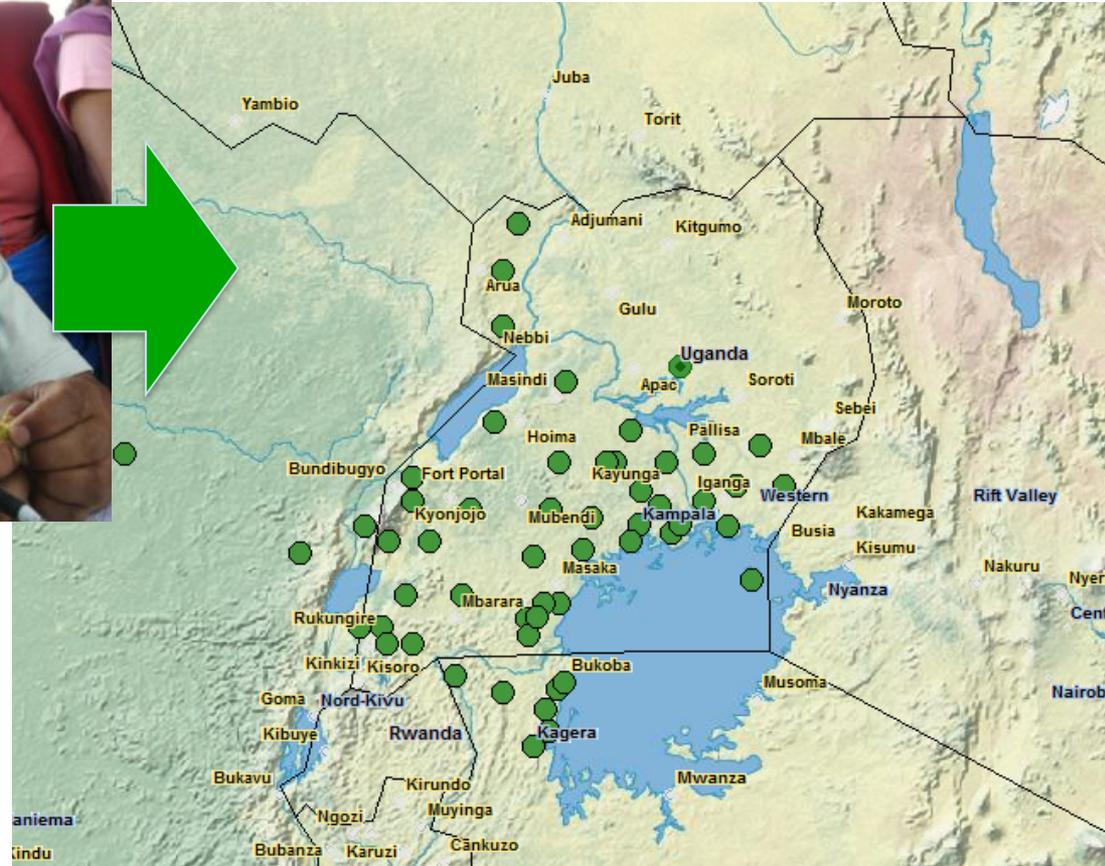
- Recently added factsheets for Kenya:** A list of factsheets including "Aflatoxins in maize", "Soap controls aphids in beans", "Coffee wilt disease", "Preventing coffee wilt disease", and "Fusarium wilt of banana". A link "See all factsheets for Kenya..." is at the bottom.
- Common pests being seen in Kenya:** A list of pests such as "Coffee coffee berry disease", "Coffee leaf rust", "Bananas/plantain banana weevil", "Panama disease of banana", and "Maize African maize stalk borer". A link "Go to full pest list..." is at the bottom.
- FIND A FACTSHEET:** A search box with the placeholder "Enter pest problem or crop here" and a "Search factsheets" button. A link "Go to treatment support page..." is at the bottom.
- IDENTIFY A PEST PROBLEM:** A form with dropdown menus for "Crops" (placeholder "Please select a crop...") and "Part of plant being affected" (placeholder "--Select a plant part--"). A "See results" button and a link "Go to full diagnostic search..." are at the bottom.
- Clinic & Partners:** A map of East Africa showing plant health clinics marked with green crosses. A link "Go to map..." is below the map.
- Plant health news for Kenya:** A list of news items, including "Kenya: Farmers...", "Saving Kenya...", "Kenya: Striga...", "Research grant to fund...", and "Ravi Singh details threat of Ug99 at A..."

Diagnostic tools

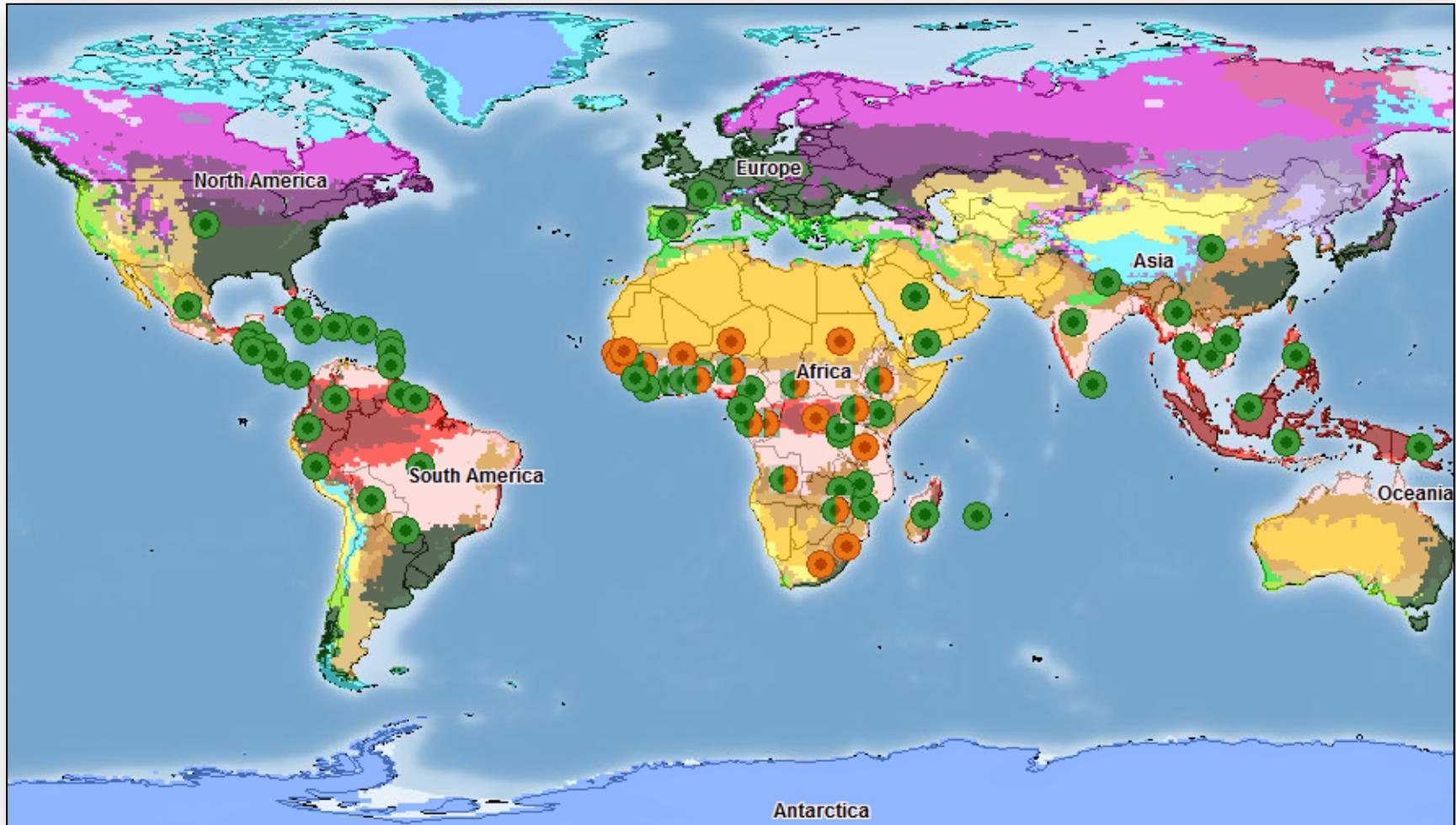
Access to region-specific treatment advice

Supporting Plant Clinics

Embedded into workflows



Combined with other global datasets



Big Data

+

Analysis tools

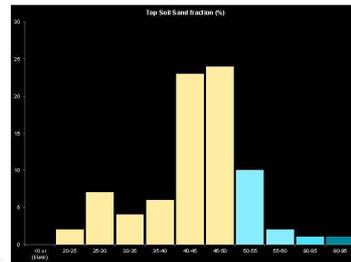
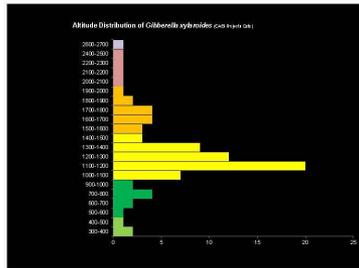
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Human knowledge

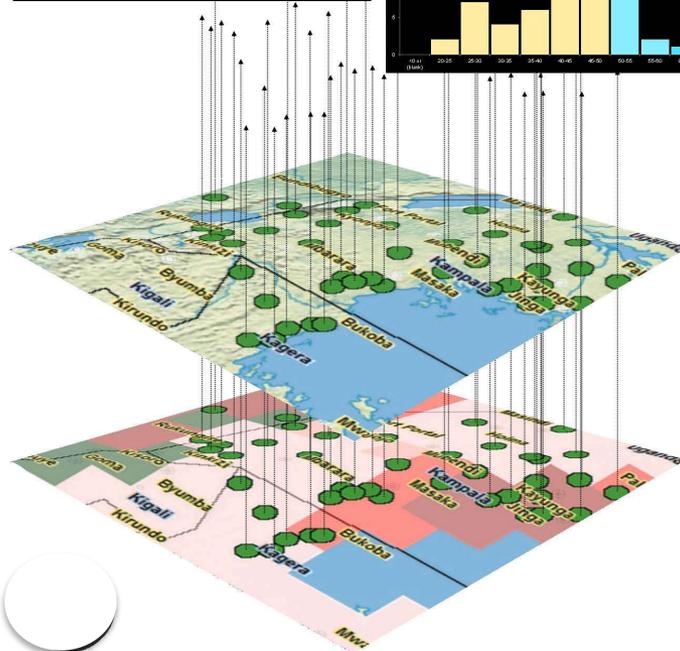
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Very interesting things...

Predictive pest maps



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



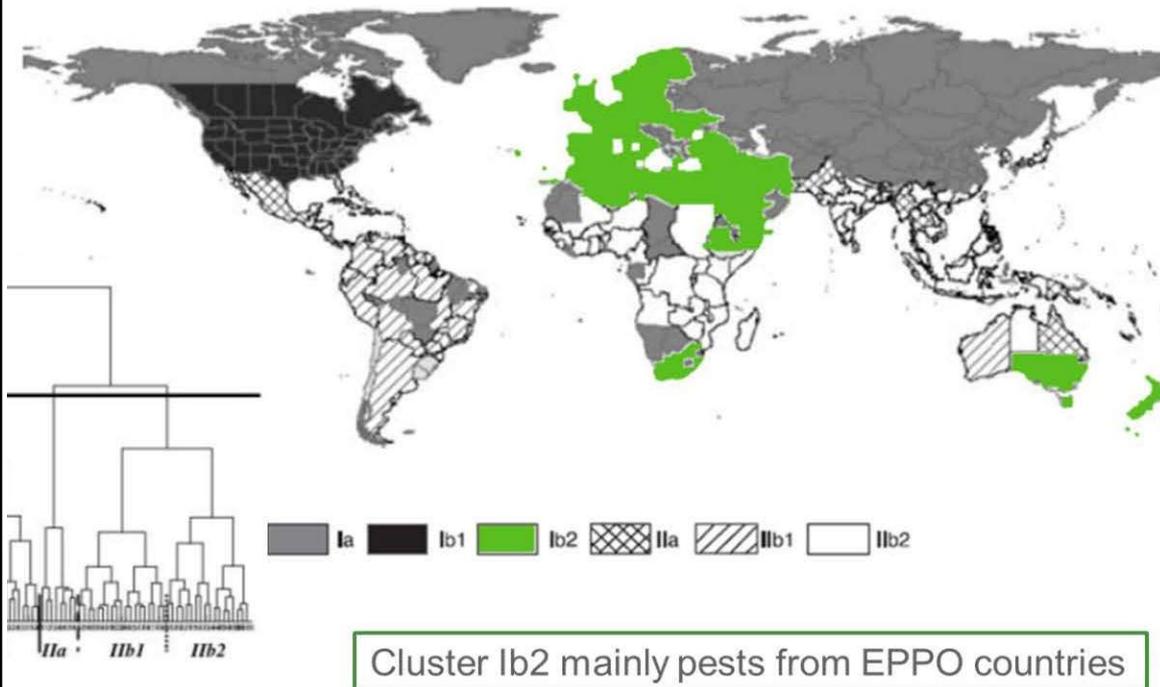
Coffee wilt distribution data

+

World soils database

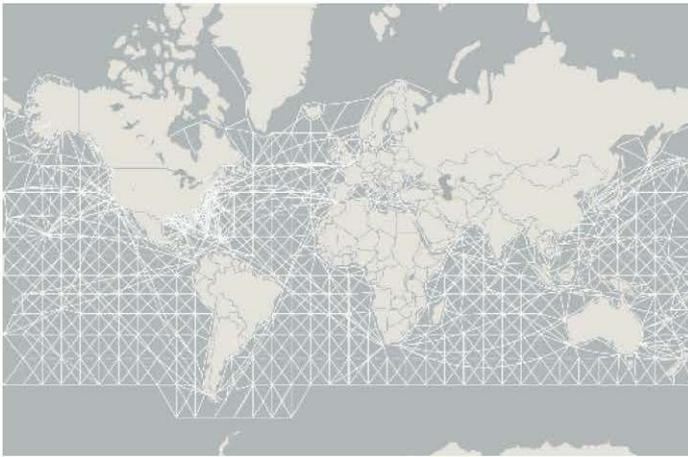
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Pest risk indexing

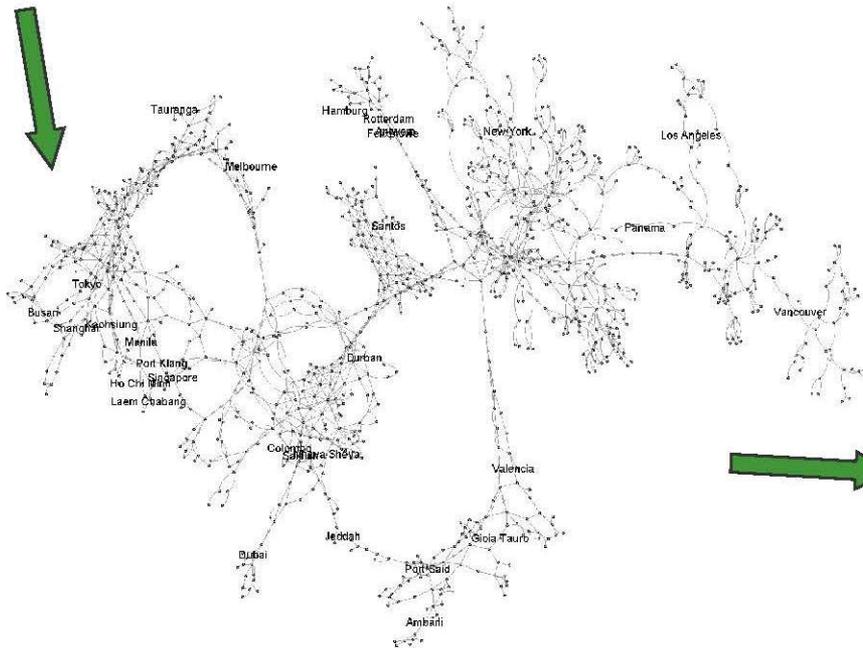


Analysis of 844 invertebrate crop pest species (Worner and Gevrey 2006)

- 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.



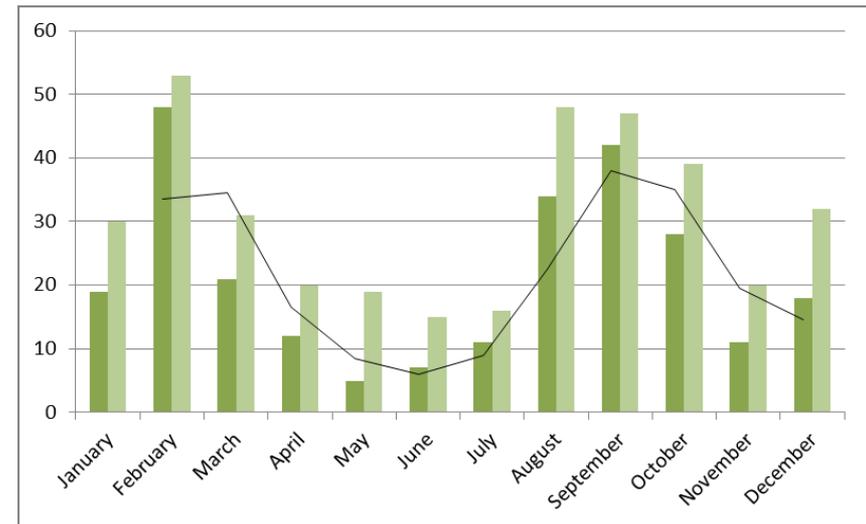
...combine
with pathway
data, or trade
routes



**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

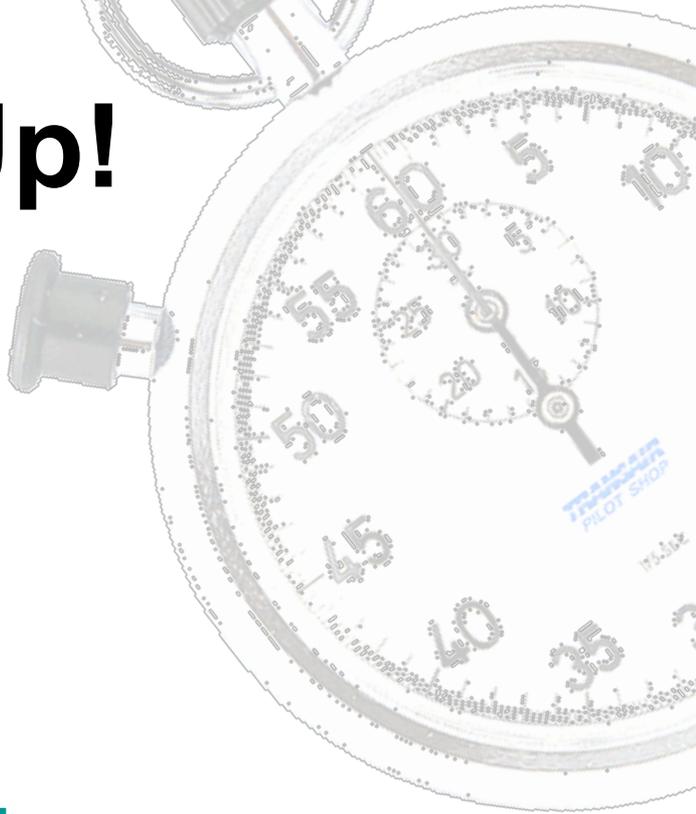
Semantic tagging

- 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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