# Data validation and analysis

IPPC National Reporting Obligations and Plantwise

Nairobi, Kenya
4-6 February 2014

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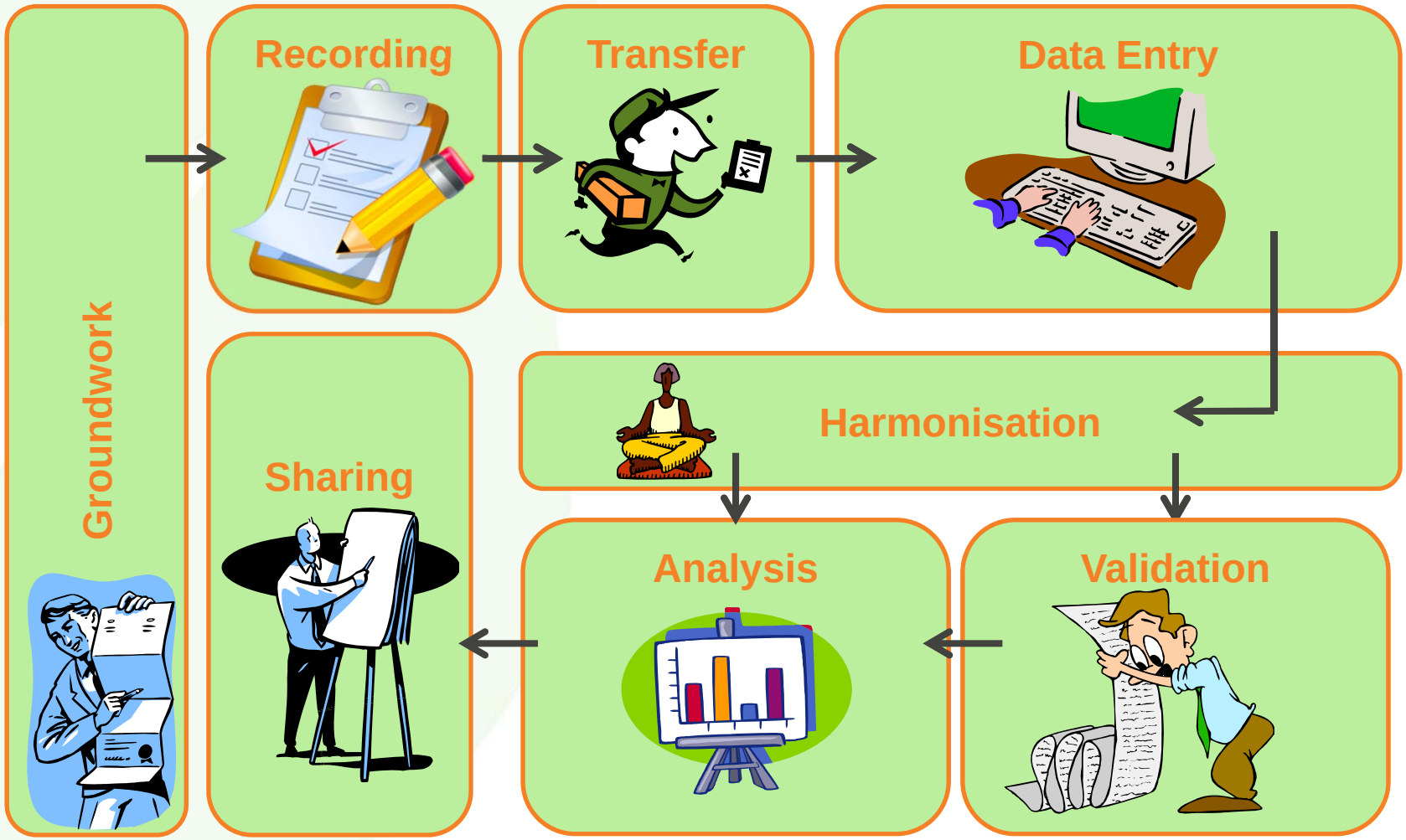
# Data collection and processing workflow




# What do we validate?

- Validation of the diagnosis

DIAGNOSIS (Start a new sheet for each new problem)

MAIZE STREAK VIRUS

- Validation of the recommendations

RECOMMENDATIONS FOR MANAGEMENT

☒ Monitor problem ☒ Cultural ☐ Biological ☒ Host resistance ☐ Fungicides ☒ Insecticides ☐ Acaricides ☐ Nematicides ☐ Herbicides

Inspect the crop regularly, especially at the two leaf stage when yield losses are greatest. Remove affected plants from the crop to reduce spread of the disease. Compost the removed plants or feed to livestock. If the problem appears to be spreading to more maize plants, spray with an insecticide containing Imidacloprid to kill the insects (plant hoppers) that spread the disease. Follow the instructions on the label for the amount and pre-harvest interval. Remove grass weeds. Tolerant varieties of maize give better yields, and are available at SLARI.

# Why validate the diagnosis?

- The diagnosis is the basis on which a recommendation is made
- Maintain accurate pest and disease records
- Identify training needs for plant doctors to improve the quality of diagnoses
- Identify new or emerging pests or diseases

# Validating a diagnosis

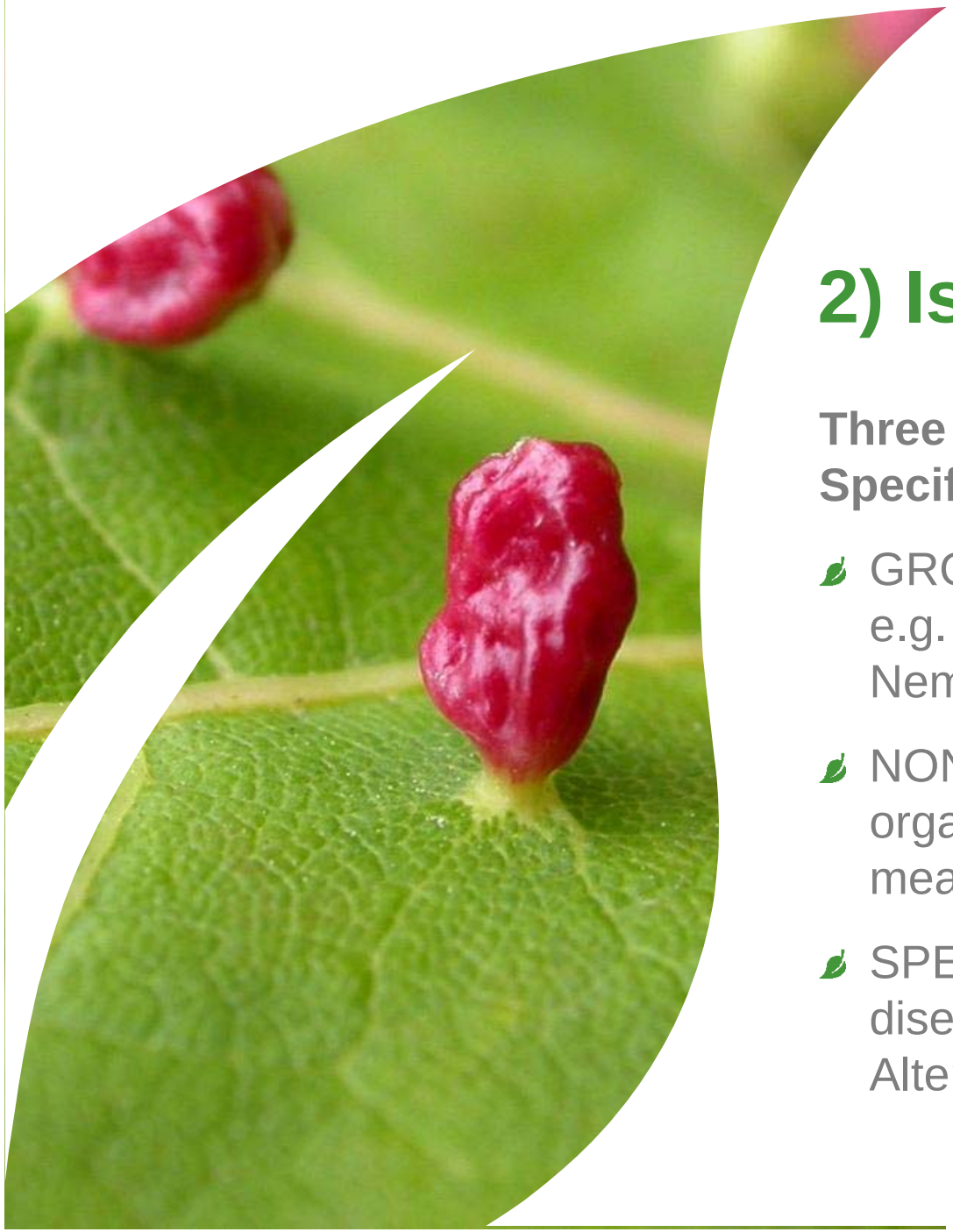
## Five key questions

- Has a Diagnosis been made?
- Is it Specific?
- Is it Plausible?
- Are the Key Symptoms recorded?
- Is it Definitive?

# 1) Has a diagnosis been made?

**Two answers: Yes, No**

- A diagnosis must refer to a known pest, disease or abiotic disorder, at least at group level (insect, virus, bacteria, etc.)
- Symptoms such as “rot” or “wilt” are not a diagnosis and would be rejected
- The diagnosis must refer to a single organism. Mixed diagnoses are rejected



# 2) Is it specific?

**Three levels: Group, Non-specific, Specific**

- GROUP - Broad pathogen groups e.g. Fungus, Bacteria, Virus, Nematode, etc.
- NON-SPECIFIC - Groups of organisms or disorders e.g. mites, mealybugs, thrips
- SPECIFIC - An individual pest, disease or abiotic disorder e.g. Alternaria solani (Early blight)

# 3) Is it plausible?

**Two answers: Yes, No**

- The disease, pest or abiotic problem must be known to be associated with the crop and country
- If the problem is not known, the record is rejected, but with follow up recommended

# 4) Are key symptoms recorded?

**Three answers: Yes, Partial, No**

- Full description - key symptoms are given that support the diagnosis
- Partial - some of the key symptoms are given that support the diagnosis
- Do not support - symptoms do not support the record. Reject record

# 5) Is it definitive?

**Two answers: Yes, No**

- Can the symptoms be confused with many other causes?
- Diagnoses which are specific, plausible, and supported by the key symptoms are not rejected if they are not definitive.  They are merely flagged as not being definitive

# Validation Outcomes

| Diagnosis | Specific | Plausible | Key symptoms | Definitive | Validation |
|---|---|---|---|---|---|
| Nothing written and no “type of organism” check box | | | | | Reject - no diagnosis |
| Symptom given | | | | | Reject - symptom |
| More than one diagnosis | | | | | Reject - mixed diagnosis |
| Yes | Specific Non-specific, Group | No | | | Follow up, not plausible |
| Yes | Specific, Non-specific, Group | Yes | No | | Reject - plausible, no key symptoms |
| Yes | Specific, Non-specific, Group | Yes | Yes | No | Key symptoms support diagnosis, not definitive |
| Yes | Specific, Non-specific, Group | Yes | Yes | Yes | Key symptoms support diagnosis, definitive |
| Yes | Specific, Non-specific, Group | Yes | Partial | No | Poor symptoms description supports diagnosis, not definitive |
| Yes | Specific, Non-specific, Group | Yes | Partial | Yes | Poor symptoms description support diagnosis, definitive |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# Why validate the recommendation?

- Monitor quality of advice and improve service to farmers
- Identify training needs of plant doctors

# Validating a recommendation

## Stage 1: Validity

- Has a recommendation been given?
- Is it effective?
- Is it safe?
- Is it practical?

# Has a recommendation been made?

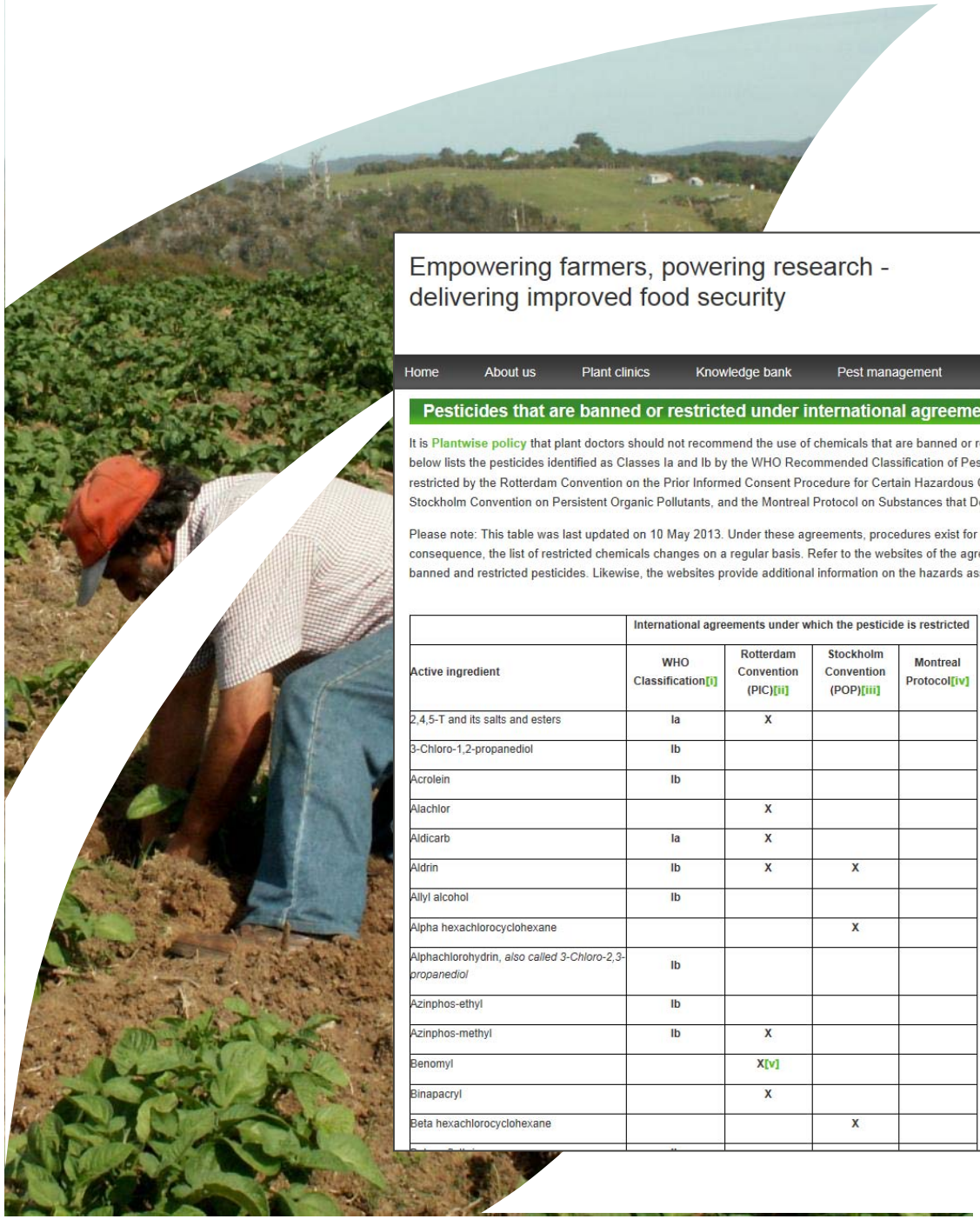
**Two answers: Yes, No**

- Has a recommendation been written?
- A recommendation must include advice on managing a pest, disease or abiotic problem

# Is it effective?

**Three answers: Yes, Partial, No**

- Is the recommendation effective against the diagnosed problem?



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## Pesticides that are banned or restricted under international agreements

It is **Plantwise policy** that plant doctors should not recommend the use of chemicals that are banned or restricted by international agreements. The table below lists the pesticides identified as Classes Ia and Ib by the WHO Recommended Classification of Pesticides by Hazard, as well as pesticides banned or restricted by the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, the Stockholm Convention on Persistent Organic Pollutants, and the Montreal Protocol on Substances that Deplete the Ozone Layer.

Please note: This table was last updated on 10 May 2013. Under these agreements, procedures exist for restricting additional chemicals and, as a consequence, the list of restricted chemicals changes on a regular basis. Refer to the websites of the agreements (given below) for the most up-to-date lists of banned and restricted pesticides. Likewise, the websites provide additional information on the hazards associated with each chemical.

| | International agreements under which the pesticide is restricted | | | |
|---|---|---|---|---|
| **Active ingredient** | **WHO Classification[i]** | **Rotterdam Convention (PIC)[ii]** | **Stockholm Convention (POP)[iii]** | **Montreal Protocol[iv]** |
| 2,4,5-T and its salts and esters | Ia | X | | |
| 3-Chloro-1,2-propanediol | Ib | | | |
| Acrolein | Ib | | | |
| Alachlor | | X | | |
| Aldicarb | Ia | X | | |
| Aldrin | Ib | X | X | |
| Allyl alcohol | Ib | | | |
| Alpha hexachlorocyclohexane | | | X | |
| Alphachlorohydrin, *also called 3-Chloro-2,3-propanediol* | Ib | | | |
| Azinphos-ethyl | Ib | | | |
| Azinphos-methyl | Ib | X | | |
| Benomyl | | X[v] | | |
| Binapacryl | | X | | |
| Beta hexachlorocyclohexane | | | X | |

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# Is it practical?

**Two answers: Yes, No**

- Given the local circumstances, how practical is it for a farmer to carry out the recommendations?

# Validity outcomes

| Effective | Safe | Practical | Validation |
|---|---|---|---|
| No recommendation given | | | Reject - no recommendation |
| No | | | Reject - not effective |
| Yes | No | | Reject – effective, not safe |
| Partial | No | | Reject – partially effective, not safe |
| Yes | Yes | No | Reject – effective, safe, not practical |
| Partial | Yes | No | Reject - Partially effective, safe, not practical |
| Yes | Yes | Yes | Effective, safe, practical |
| Partial | Yes | Yes | Partially effective, safe, practical |

# Validating a recommendation

## Stage 2: Quality

- Is it comprehensive?
- Is it detailed?

Recommendations are not accepted/rejected on the basis of comprehensiveness or detail.

This stage of validation is to provide feedback for learning and quality assurance purposes.

# Is it comprehensive?

**Three answers: Yes, Partial, No**

- Have all the key management options been considered?
- A complete recommendation should give all or most of the preferred control options including preventative measures

# Is it detailed?

**Two answers: Yes, No**

- Has sufficient detail been included to enable the farmer to carry out the recommendation without having to seek further information?

# Analysis


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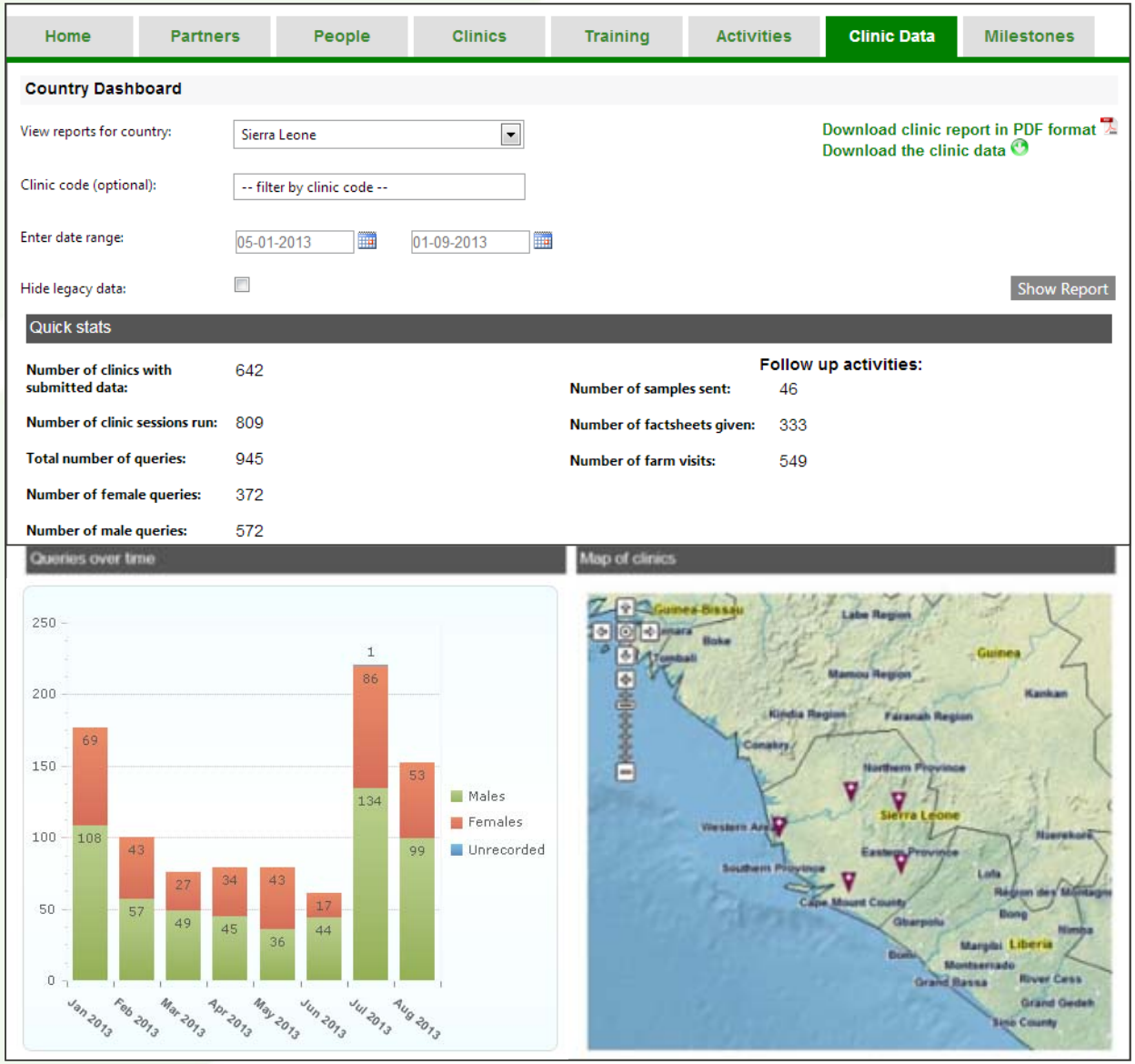
# Analysing clinic data can show…

- What the most common plant health problems are, and which crops they affect
- What type of management recommendations plant doctors are making
- Differences between places – main pest and disease problems, different crops grown by men/women, etc
- How many men and women are coming to clinics over time
- And MUCH MUCH more!

# POMS for data management & analysis



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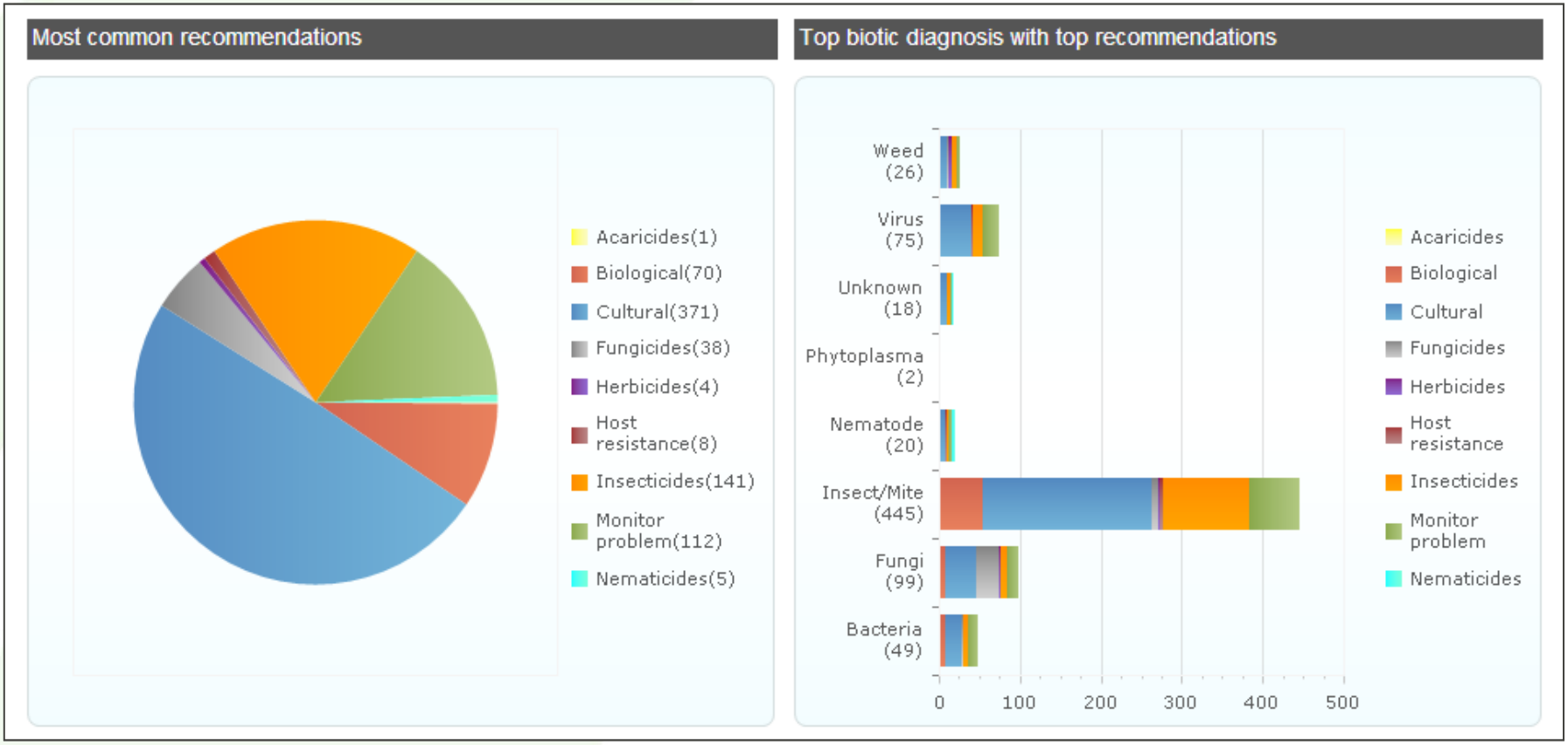
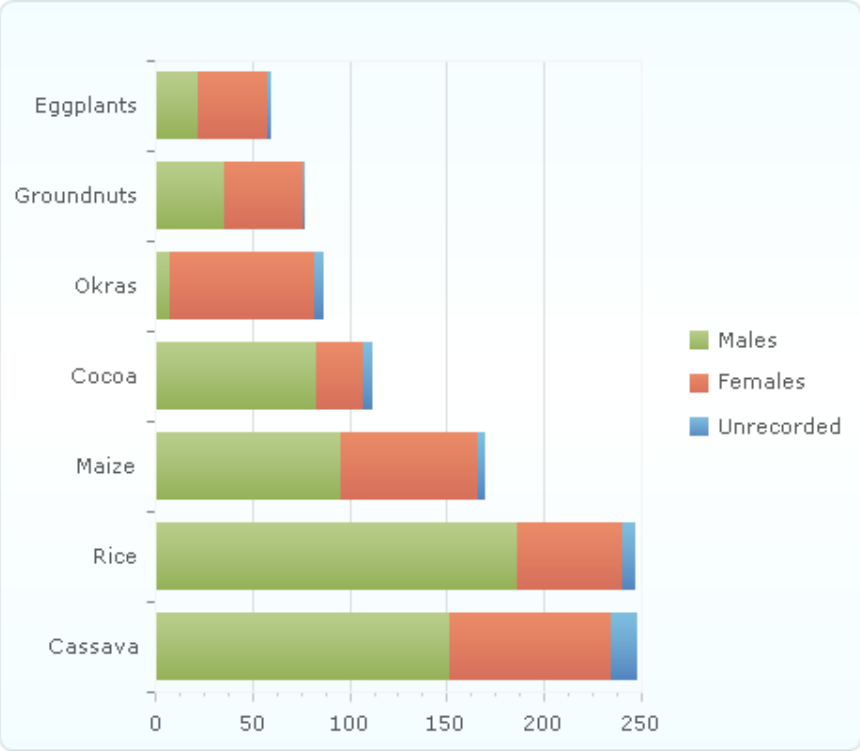


# POMS for data management & analysis

## Top crops




## Top crops & top pests

**cassava** (248 *reports*)
- grasshoppers (24 *reports*)
- cutting grass (18 *reports*)
- cassava mosaic virus (17 *reports*)
- rodents (15 *reports*)
- mosaic virus (12 *reports*)

more +

**rice** (246 *reports*)
- rice gall midge (29 *reports*)
- termites (11 *reports*)
- pest (11 *reports*)
- caseworms (9 *reports*)
- cutting grass (9 *reports*)

more +

**maize** (169 *reports*)
- maize streak virus (35 *reports*)
- stem borers (34 *reports*)
- insects (9 *reports*)
- caterpillars (8 *reports*)

# Interpreting data analyses

- Data show the main problems and crops seen in clinics, and are not necessarily representative of all farmers.
  - If farmers are roughly split 50:50 men:women in a country, but our clients are 70:30, data will be biased towards pests of men's crops
  - If a clinic deals disproportionately with one crop (e.g. cocoa), data will show a bias towards pests of that crop. The biggest pest problem in an area might actually be on a different crop (e.g. cassava)

# Interpreting data analyses

- Crops grown and problems encountered are seasonal, so the date range may affect results
- Aggregated data can be misleading

# Why is it important to share analyses?

- Key players in the plant health system can use the analyses to inform their roles

| | |
|---|---|
| Regulators | • Identify new pest outbreaks<br>• Identify areas of intervention & inform quarantine policies & decisions |
| Researchers | • Focus research on key pests |
| Agro-input suppliers & dealers | • Determine which products to register<br>• Assess/predict demand and adjust stock quantities |
| Policy makers | • Develop government policy |
| Extensionists & plant doctors | • Improve diagnoses & recommendations<br>• Become informed about emerging pests<br>• Focus extension messages for farmers on key pests |
| Farmers' organisations | • Find out what pests are in the area<br>• Plan IPM strategies |

# How can the analyses be shared?

- The exact methods of sharing will be decided in each country
- Some examples include:
  - stakeholder workshops
  - circulation of regular reports
  - POMS logins
  - via the National Data Manager
  - publicly sharing via the Knowledge Bank

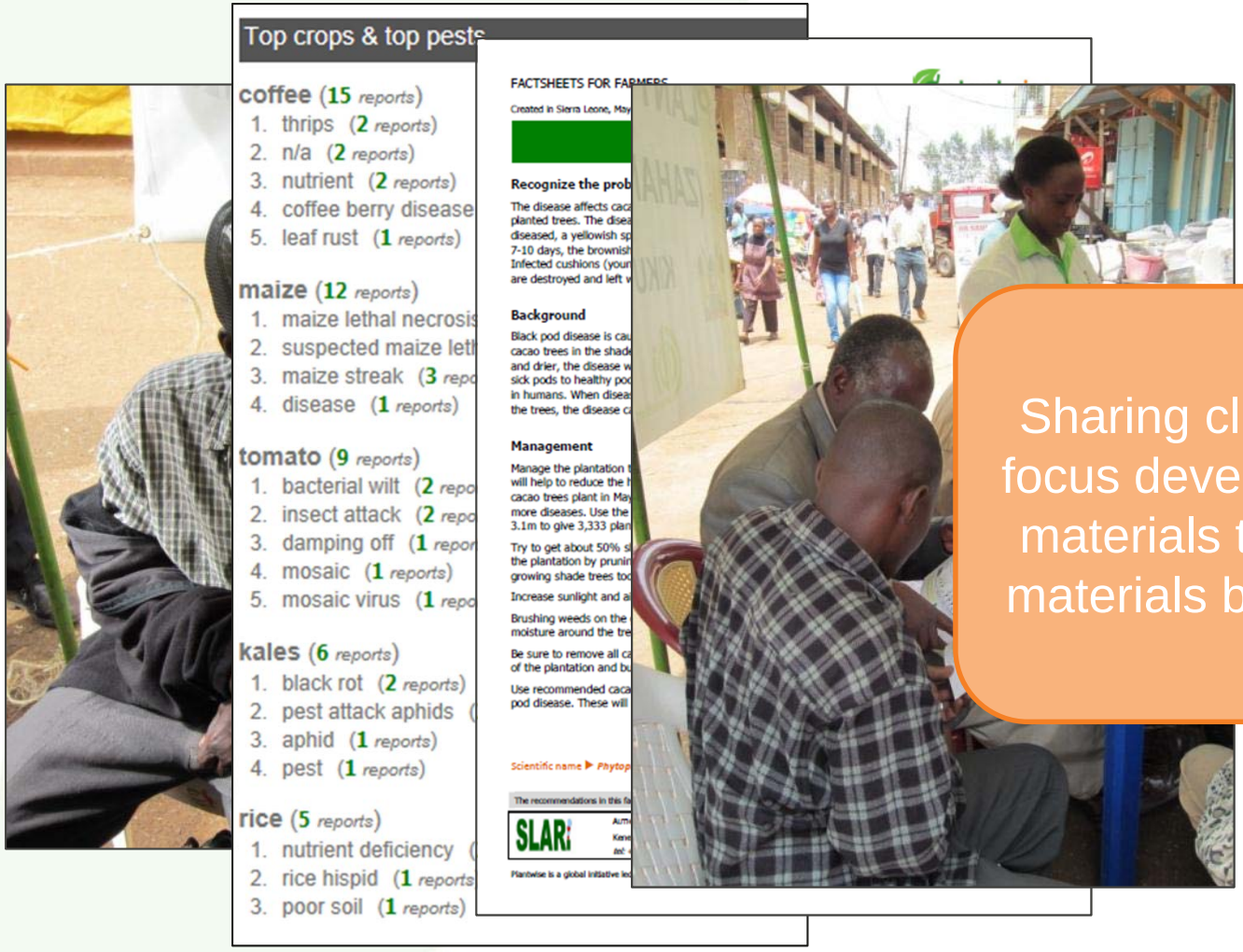
# Things to consider

- How frequently do you want to circulate data analyses?
- What format would you like the analyses in?

# Who can see the data?

- Partners and governments sign agreements with CABI that tell us how they want to share their data
  - Only amongst country implementers and relevant in-country government bodies
  - Open to the public
- POMS is secure and only authorised people have access

# ……it can also improve the materials available to help plant doctors…..




Sharing clinic data can help to focus development of extension materials to distribute relevant materials back out to the clinics

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# Thank you

*We wish to acknowledge the support of our donors, as well as our national and international partners who make Plantwise possible*

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Swiss Agency for Development and Cooperation SDC

Irish Aid
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