

# Integrated crop management for enhanced yield and profit

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## What is IPM?

IPM is a decision support system for the selection and use of pest control tactics harmoniously coordinated into a management strategy that takes into account the interests of and impacts upon producers, society and the environment' [Kogan 1998]

## **Virus-resistant tomato**

**Open-pollinated  
variety Vybhay with  
resistance to tomato  
leaf curl virus  
disease (left)**

**Hybrid variety  
developed under  
licence by Namdhari  
Seeds**



## Why would a farmer adopt IPM?

- Reduced input costs [pesticides]
- Reduced labour input
- Higher yields

## For IPM adoption there has to be...

The same or greater cost benefit than the current practice

## **An IPM system will deliver greater cost benefit than existing farmer practices....**

- Pest management decisions by smallholders are complex
- They depend on the predictability and impact of the pest or pest complex
- A crop variety may be chosen for reasons other than yield or pest resistance
- Low soil fertility and water availability are usually the over-riding concerns

# Rice ecologies

**Clockwise from top right:**

**Irrigated lowland in  
Philippines**

**Irrigated – terraced systems  
in Indonesia**

**Upland production system in  
Nicaragua**

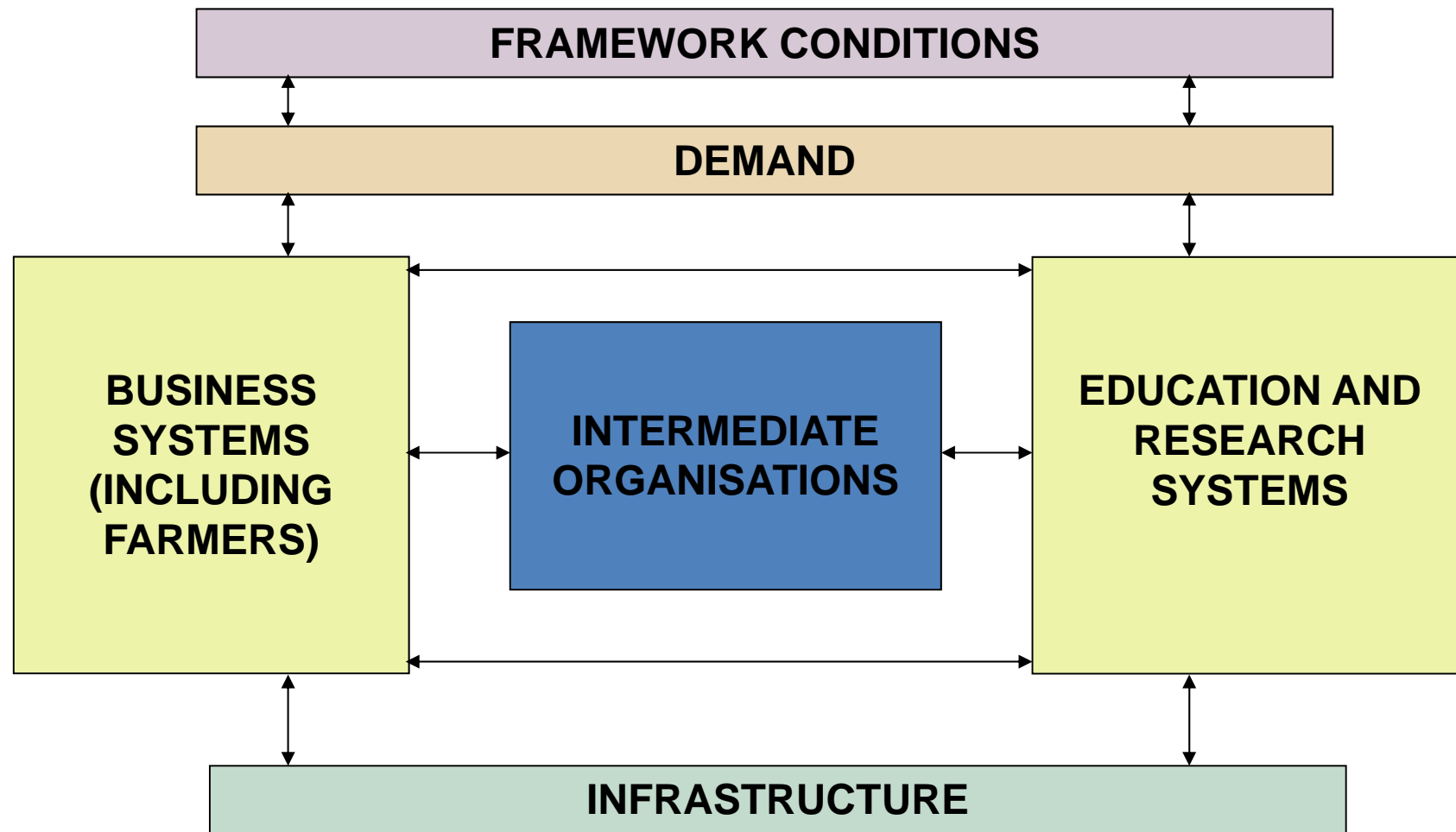


# Water and labour

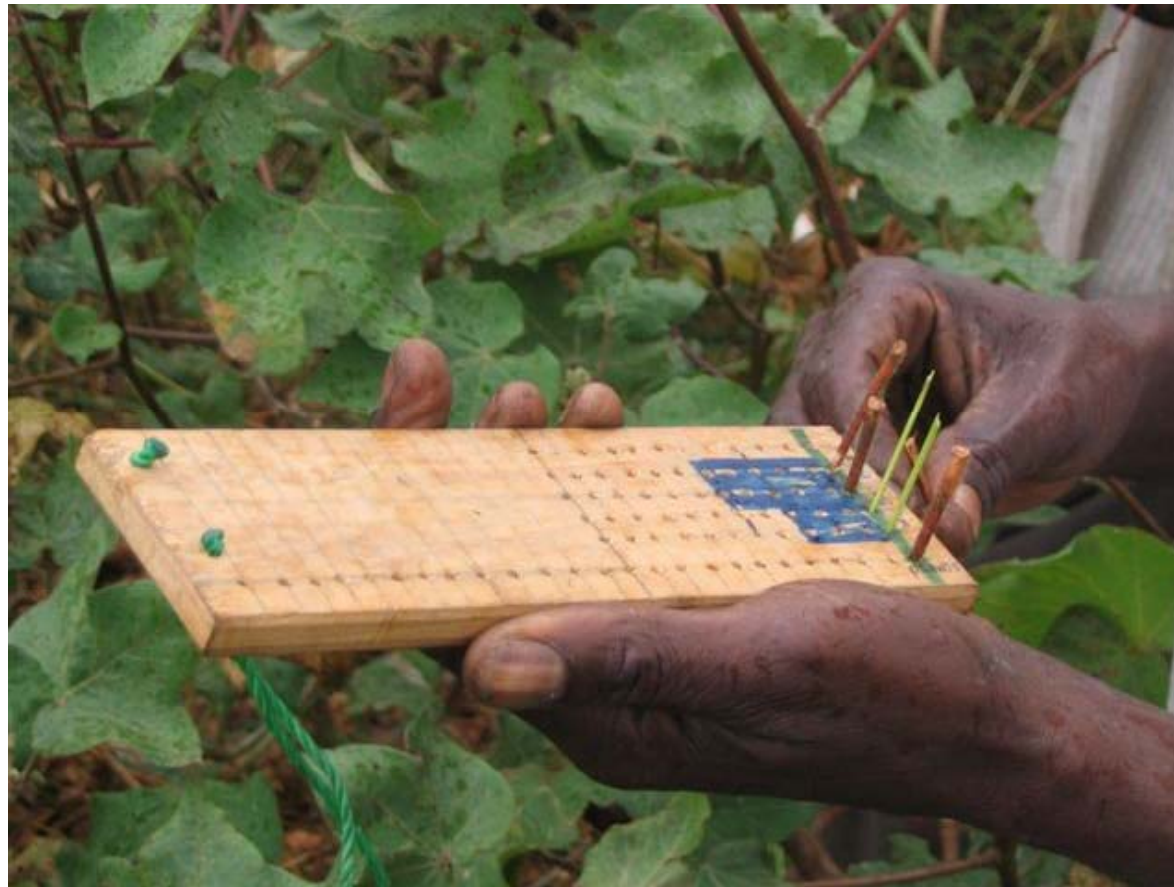




## Innovation system diagram (from Arnold and Bell)



## IPM May be labour- and knowledge-intensive

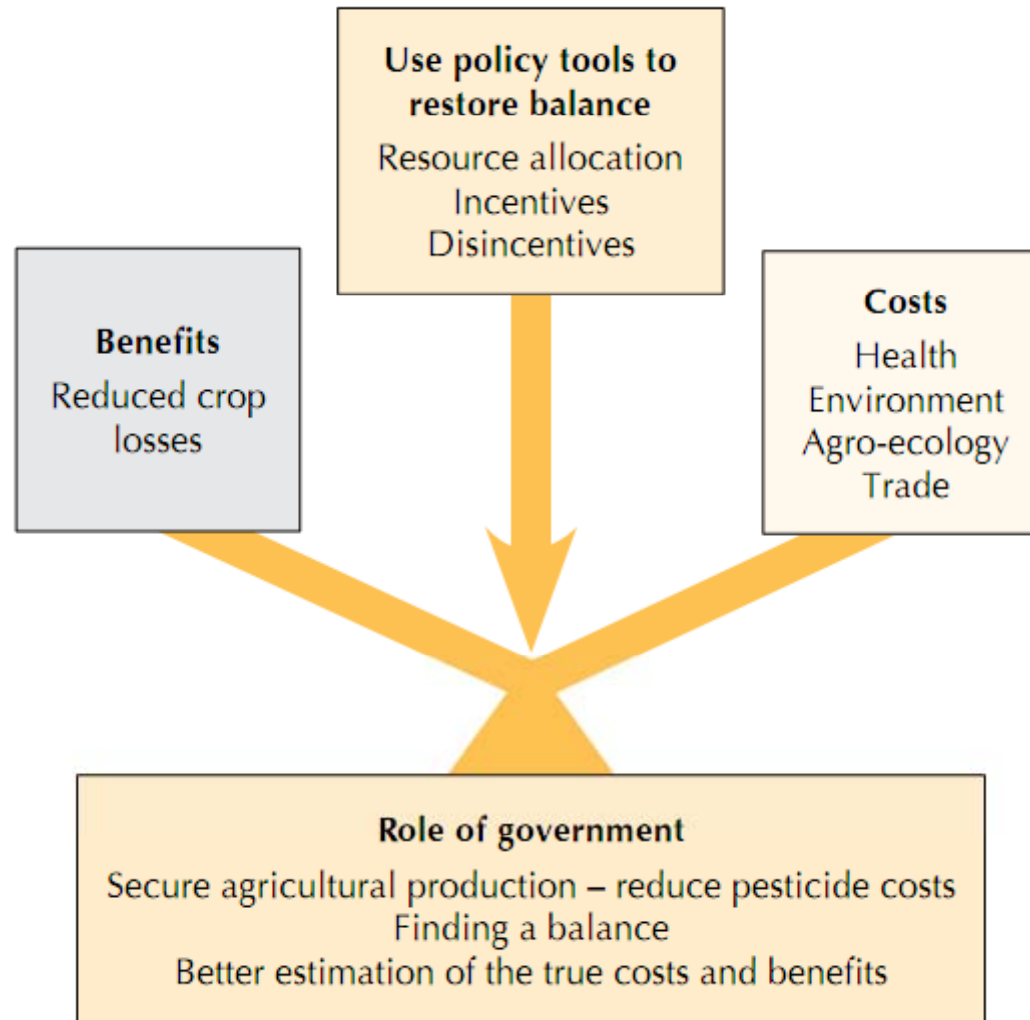


Wooden pegboard as a scouting aid in cotton IPM [Uganda]

## Roadblocks and bottlenecks.....



# Pesticides: role of government



**Source:** FAO Global IPM  
Facility

## Registration issues for biopesticides

**Pheromone for  
eggplant fruit and  
shoot borer**



# Producing safe food

## Strengthening National Food Control Systems

- Support to fish testing laboratories in ACP countries
- Implementing food safety management systems



# Integrated management of groundnut in eastern Uganda

## Groundnut: nutrient requirements

- Adequate levels of phosphorus, potassium, magnesium and calcium are needed. Use well-rotted organic manures or apply to previous crop.
- Large numbers of empty pods are an indicator of calcium deficiency.
- Apply gypsum at early flowering to address calcium deficiency: in most cases, 200-400 kg/ha is adequate.



## Groundnuts: effect of moisture on disease levels

### *Drought*

Pod formation → pod rot.

Pod filling → aflatoxin colonization.

Late gs → groundnut yellow mold.

### *Waterlogging*

Late gs → groundnut yellow mold.

Before harvesting → pod rot.

## Groundnuts: weed management

- Keep crop weed-free in first 3-6 weeks after sowing to reduce competition.
- Subsequent weedings before flowering and at least one during pegging.
- Avoid covering the base of plants with soil.
- Hand-weed (rather than hoe) once flowering and pegging begins.

## Main pest and disease problems of groundnut in eastern Uganda

- Groundnut rosette disease
- Leaf miner
- Leaf spot

# Groundnut rosette disease



Groundnut plants affected by green (left) and chlorotic (right) rosette disease

# *Aphis craccivora*

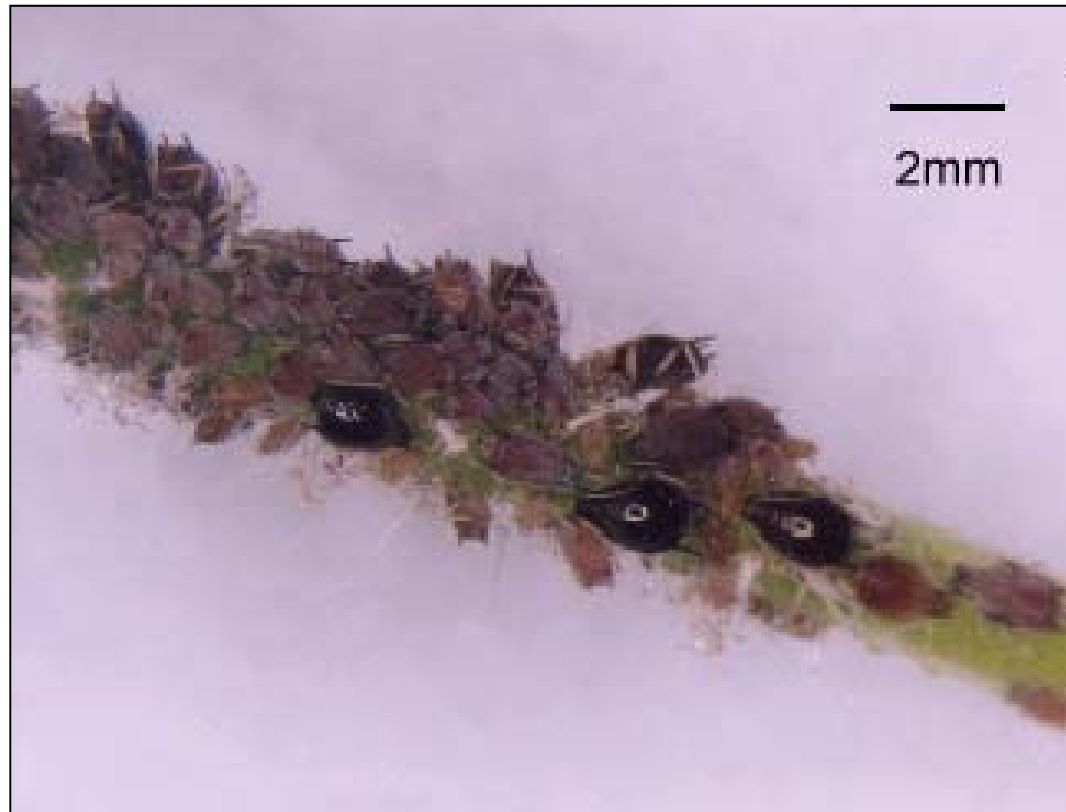


Photo: Jeroen Willekens

## Emerging pests: leaf miner

- *Aproaerema modicella*  
(Deventer)(Lepidoptera: Gelechiidae).
- Larvae burrow into and mine leaflets.
- Leaves pulled together with threads.
- Burnt appearance of crop in severe infestations.
- Systemic insecticides such as dimethoate (organophosphate) recommended for control.

## Characteristics preferred by farmers in groundnut varieties

Characteristic	No. of farmers	% of farmers
Yield	170	82
Disease res.	141	68
Marketability	118	57
Maturity	116	56
Drought res.	92	44
Taste	92	44
Seed size	41	19
Ease of harvest	25	12
Colour	20	10
Easy to pound	18	9
Stores well	5	2

Source: baseline survey, eastern Uganda, 2000

## On-farm varietal trials run by a women's group in Kumi District in eastern Uganda





## ICM of groundnut in eastern Uganda

- Varieties with suitable qualities
- Early sowing date
- Crop rotation (maize, sorghum or millet)
- Good agronomic practices

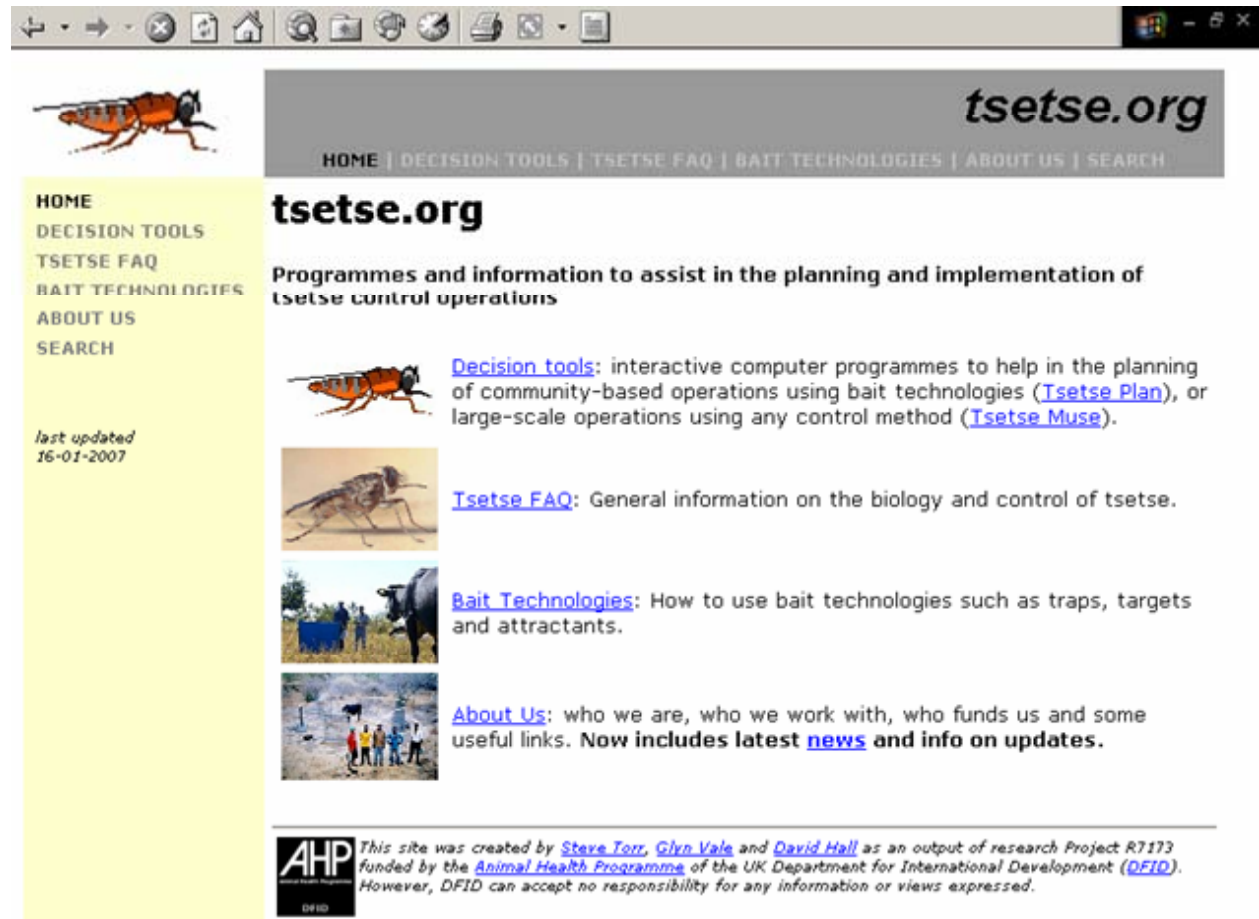
**It's not just  
about plants!**

**'Artificial cow' –  
reducing the  
incidence of  
sleeping  
sickness and  
nagana**



# Strengthening capacity

# Online decision support systems



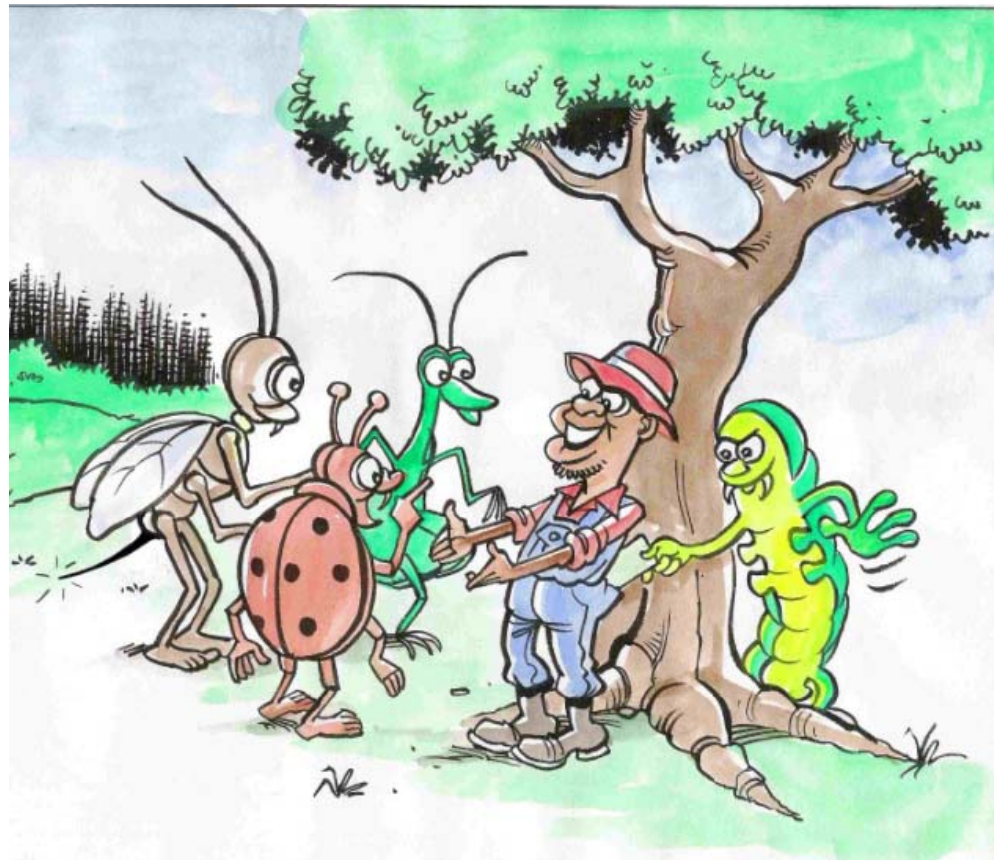
The screenshot shows the homepage of the tsetse.org website. At the top, there is a navigation bar with the URL 'tsetse.org' and a menu with links for 'HOME', 'DECISION TOOLS', 'TSETSE FAQ', 'BAIT TECHNOLOGIES', 'ABOUT US', and 'SEARCH'. Below the navigation bar, the main content area features a large heading 'tsetse.org' and a sub-heading 'Programmes and information to assist in the planning and implementation of tsetse control operations'. There are four main sections, each with a small image and a link: 'Decision tools' (with an image of a tsetse fly), 'Tsetse FAQ' (with an image of a tsetse fly), 'Bait Technologies' (with an image of a person and a cow), and 'About Us' (with an image of a group of people). A sidebar on the left contains a navigation menu with links for 'HOME', 'DECISION TOOLS', 'TSETSE FAQ', 'BAIT TECHNOLOGIES', 'ABOUT US', and 'SEARCH', along with a 'last updated 16-01-2007' notice. At the bottom, there is a logo for 'AHP' (Animal Health Programme) and a disclaimer: 'This site was created by Steve Torr, Glyn Vale and David Hall as an output of research Project R7173 funded by the Animal Health Programme of the UK Department for International Development (DFID). However, DFID can accept no responsibility for any information or views expressed.'

## **Strengthening capacity:** participatory video



**Azolla production for  
fertilizer and livestock  
feed**

## Getting the message across



# 'The horrors of wireless telephony'

1918

W.K Haselden

Source: Cartoon archive,  
University of Kent, UK



# Conclusions

- **Integrate appropriate crop management practices**
- **Communicate (and advocate) effectively**
- **Strengthen capacity of farmers and other users or suppliers of technologies**