Application of digital microscopy for the remote identification of invertebrate pests

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Remote Microscopy (RM):

- Essentially …

- A camera connected to a microscope that in turn is connected to dedicated hardware/computer

- A live image of a specimen under the microscope is transmitted over the internet and remotely accessed by a diagnostician, with real time communication via telephone or voip (voice over internet protocol, e.g., Skype)
Study tour to Australia & New Zealand (by my colleague Dan Pye)

All organisations used:
Nikon Digital Sight System (Nikon controller and Nikon digital microscope camera)

Approximate cost per unit: £4,500 (= €6,370)

Remote Microscopy (RM): Proof of Concept Study

• Objective: To lay the foundations of a RM network as a tool for specialist-specialist interactions between the different constituent Plant Health bodies within the UK

• Fera, SASA & RBG Kew (Quarantine House)
Remote Microscopy (RM): Proof of Concept Study

• Successful two-way trials carried out (eventually) between Fera and SASA, and between Fera and Kew
• Successful three-way trial carried out last week!
• Unable to use live video streaming (Room 1), but RM was conducted using an image refresh time of 500 milliseconds (Room 3)
• All parties concluded this provided sufficient capacity of requisite image quality
• THE TECHNOLOGY WORKS!
Room 1 or Room 3?
Remote Microscopy (RM): Proof of Concept Study

HOWEVER …

• Project proceeded slowly because of IT security issues and concerns
• Each institute’s IT Dept. has an obligation to ensure new applications do not compromise their organisation’s IT security
Remote Microscopy (RM): Proof of Concept Study

• But once the system was understood, it was found to be fairly easy to install onto the respective networks

• Simple common security principle was agreed: each organisation controls access to their own site (owner of the image hosts it on their bespoke server accessible by approved partners dialling in to a specified password-protected address)
Decide which organisations to link up
  Diagnostic laboratories?
  Ports-of-Entry?
UK Overseas Territories?
EPPO laboratories?
Linking taxonomic specialists?

Training modules (new pests?)
Long Distance Remote Training (extension work)