



Joint FAO/IAEA Programme
Nuclear Techniques in Food and Agriculture

The Sterile Insect Technique and how it contributes to climate-smart agriculture

Online Panel Discussion

Contribution of Nuclear Applications to Food Security in a Changing Climate

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A world that is hungry

- Current world population of 7.9 billion
- About 690 million people globally are undernourished
- Food security is affected by insect pests



Arthropod pests

- Crop
- Livestock
- Human health



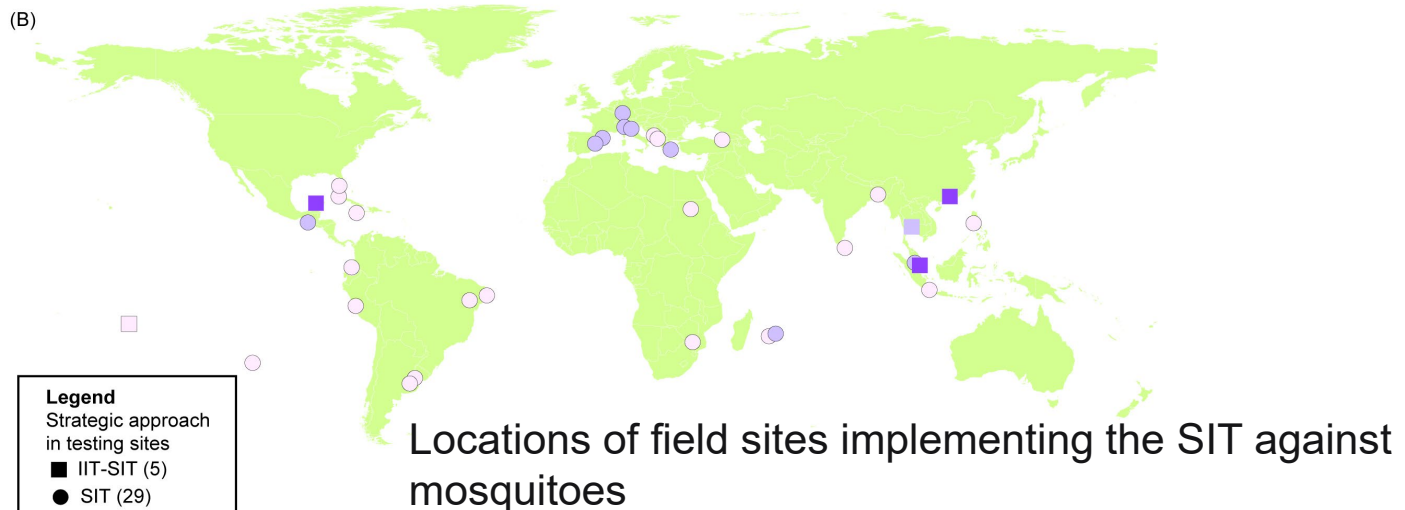
Insect Pest Management (IPM)

- For the first 70 years of the 20th century control was largely based on chemical insecticides
- The global insecticide market is estimated at between \$ 60-80 billion.



The Sterile Insect Technique (SIT)

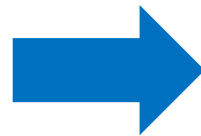
- Type of birth control for insects.
- Ingenious idea that has been around since the 1950s and has been implemented in both developing and developed countries.
- It has been successful in controlling a number of key insect pests, including fruit flies; tsetse fly; screwworm; moths and mosquitoes.



The Sterile Insect Technique (SIT)



Production of large numbers



Male sterilization with ionizing radiation



Release of sterile males



Sterile male with wild female mating



No offspring



SIT is an environmental friendly technique

- Reduces the use of insecticides
- Targets the pest species, and not other beneficial insects.
- Used together with other control methods such as biological control and or bait stations and traps.



- When used as a part of an area wide integrated pest management program it is highly successful, is a clean technique and can be used to suppress, eradicate, contain or prevent the establishment of pests.

SIT: Advantages - limitations

Advantages	Limitations
Friendly to the environment	Not stand-alone
Species specific	Prior suppression required
No risk of resistance	Delayed effect (no kill)
Reduced use of insecticides	Not for all insects
No reproduction: released insects cannot become established	Immigration of gravid females (AW strategies)
Aerial dispersal: civil unrest, mountainous, forests....	

Climate change and IPM

- Climate change is going to impact the distribution of pest species, increasing the survival and establishment of invasive pests in previously inhospitable regions.
- SIT can eradicate, contain or prevent the establishment of invasive populations without leaving an ecological footprint.

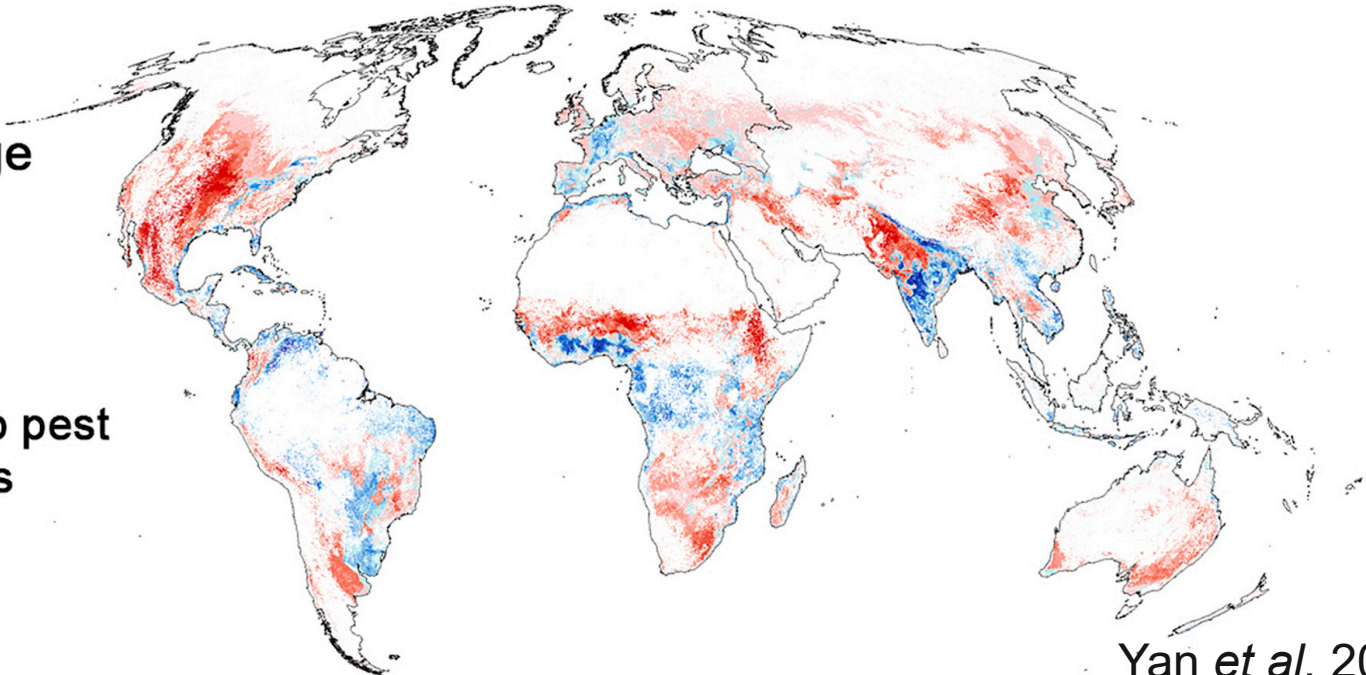
Climate change



Changes in crop pest
species richness

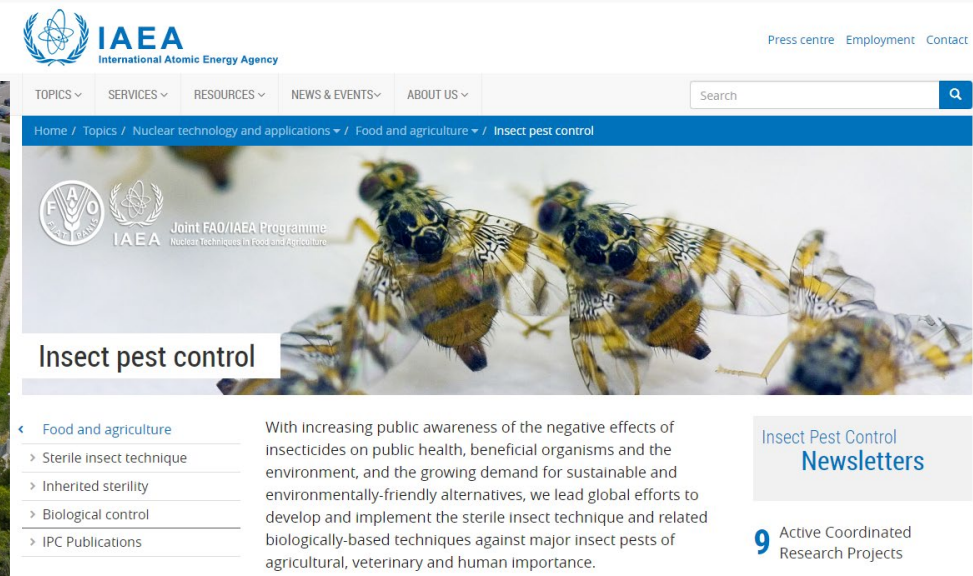
Red: increase

Blue: decrease



Joint FAO/IAEA Centre of Nuclear Techniques in Food and Agriculture, Insect Pest Control Sub-programme

- Research activities, service delivery, supplying of biological materials and providing guidance and expert support for technical cooperation projects.
- The Insect Pest Control Laboratory carries out applied research and methods development and improvement, helping Member States adapt and integrate SIT and area-wide integrated pest management programmes.



The screenshot shows the IAEA website page for Insect Pest Control. The header includes the IAEA logo and navigation links: TOPICS, SERVICES, RESOURCES, NEWS & EVENTS, ABOUT US, and a search bar. The main content area features a large image of several flies, with the text "Insect pest control" overlaid. Below the image is a list of links: Food and agriculture, Sterile insect technique, Inherited sterility, Biological control, and IPC Publications. To the right, there is a section for "Insect Pest Control Newsletters" with a "9 Active Coordinated Research Projects" indicator.



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Thank you

