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The U.S. Government's Global Hunger and Food Security Initiative

Highlights of Integrated Pest Management Innovation Lab

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IPM Innovation Lab Host Countries

Asia

- Bangladesh
- Nepal
- Cambodia
- Vietnam

Africa

- Ethiopia
- Kenya
- Tanzania





IPM IL RFAs for the New Program

- **IPM for Exportable fruit crops – Vietnam**
- **Biocontrol of *Parthenium* – East Africa**
- **Biodiversity and climate change – Nepal**
- **Modeling of Invasive insects dispersal – Africa, Asia, North and Central America**
- **Vegetable crops IPM – Asia**
- **Rice IPM – Cambodia**
- **Vegetable crops IPM – Africa**
- **Grain crops IPM – Africa**



Major Aspects of IPM IL

- Development of IPM components and packages for selected crops
- Monitoring and development of management technologies for invasive species



IPM Package for Tomato

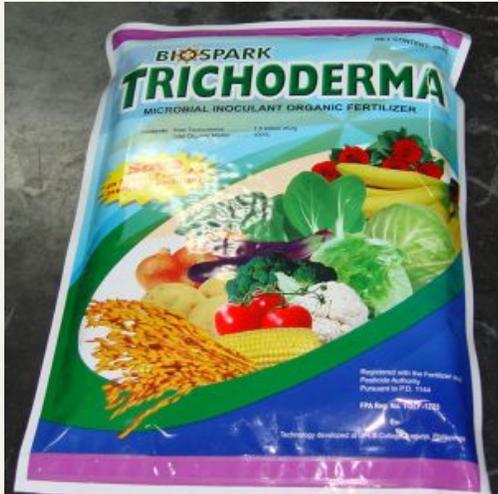
- **Seed or seedling treatment with *Trichoderma*, and *Pseudomonas fluorescens***
- **Use of coconut pith for seedling production**
- **Use of VAM, neem cake and other organics**
- **Selecting virus-resistant varieties**
- **Grafting on resistant rootstock for bacterial wilt, Fusarium and others**
- **Staking and mulching**
- **Yellow sticky traps for thrips, leafminers etc.**
- **Pheromone traps for *Helicoverpa* and *Spodoptera***
- **Host-free period and rogueing for control of virus diseases**
- **Use of Biopesticides such as neem**
- **Use of microbial pesticides such as NPV, *Metarhizium***





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Trichoderma



Seedling production
Using coconut pith



Grafting tomato
Seedlings



Trichoderma treated and untreated cauliflower



Area wide pest management
With Pheromone traps



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Invasive Weed - Parthenium

Parthenium Weed

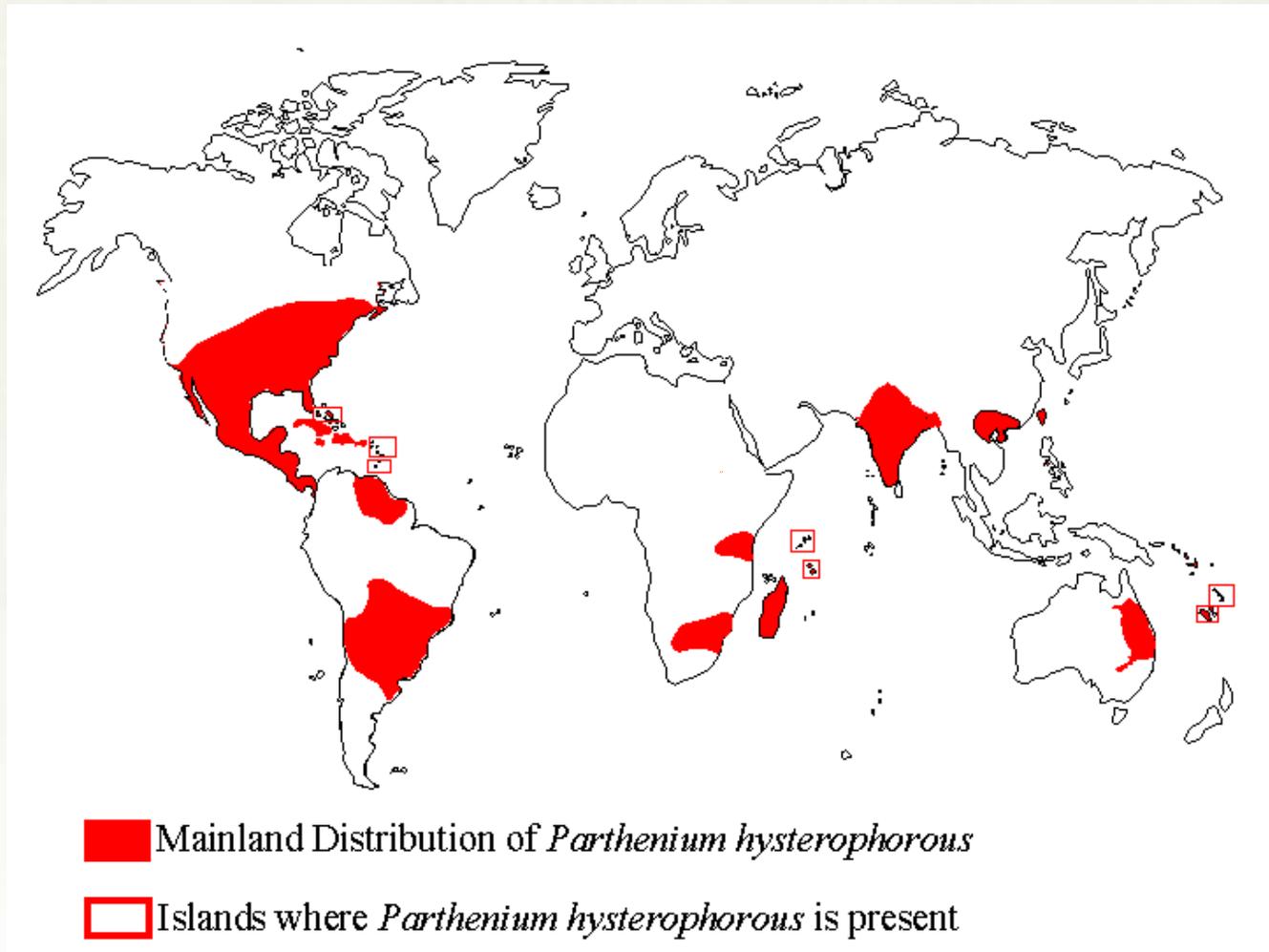
Origin: Mexico, Texas region

- Introduced to Ethiopia in 1970s
- Spread to Kenya, Tanzania and Uganda





Worldwide distribution of *Parthenium hysterophorus*



Source: Modified from University of Queensland's Centre for Biological Information Technology



Zygogramma bicolorata (Coleoptera: Chrysomelidae)

- Introduced to Australia in 1980
- Introduced to India in 1984
- In 2014 released in Ethiopia after obtaining necessary permits





Papaya mealybug, *Paracoccus marginatus*

Origin: Mexico

Spread:

**1990s – Caribbean, Florida and
South America**

2001-5 – Micronesia and Hawaii

2008-9 – India, Indonesia,

2010-11 – Ghana, Benin, Nigeria

2014 – **Tanzania, Mauritius**

Next year or two it will be in Malawi



**Introduction of the parasitoid to
India from Puerto Rico resulted in a
benefit of \$500 million to 1.34 Billion**





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Acerophagus papayae searching the
papaya mealybug for egg laying



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Tuta absoluta

(South American tomato leafminer)

Introduced to Spain in 2006.

**it has spread in Europe, Mediterranean,
Middle East, West and East Africa .**

2013 – Reached Ethiopia.

**2014 – Reached Kenya, Tanzania, and
India**





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Spread of *Tuta absoluta*





Groundnut leafminer

A native of Asia

- Introduced to Uganda in 1996
- Now covered East and South Africa by 2008
- IPM IL is working with Peanut and Mycotoxin IL.
- IPM IL issued a RFA to model its spread in Africa





Pearl millet headminer control in Niger

Collaboration with Sorghum & Millet IL and ICRISAT, Niger



Head
Miner
larva



Parasitoid

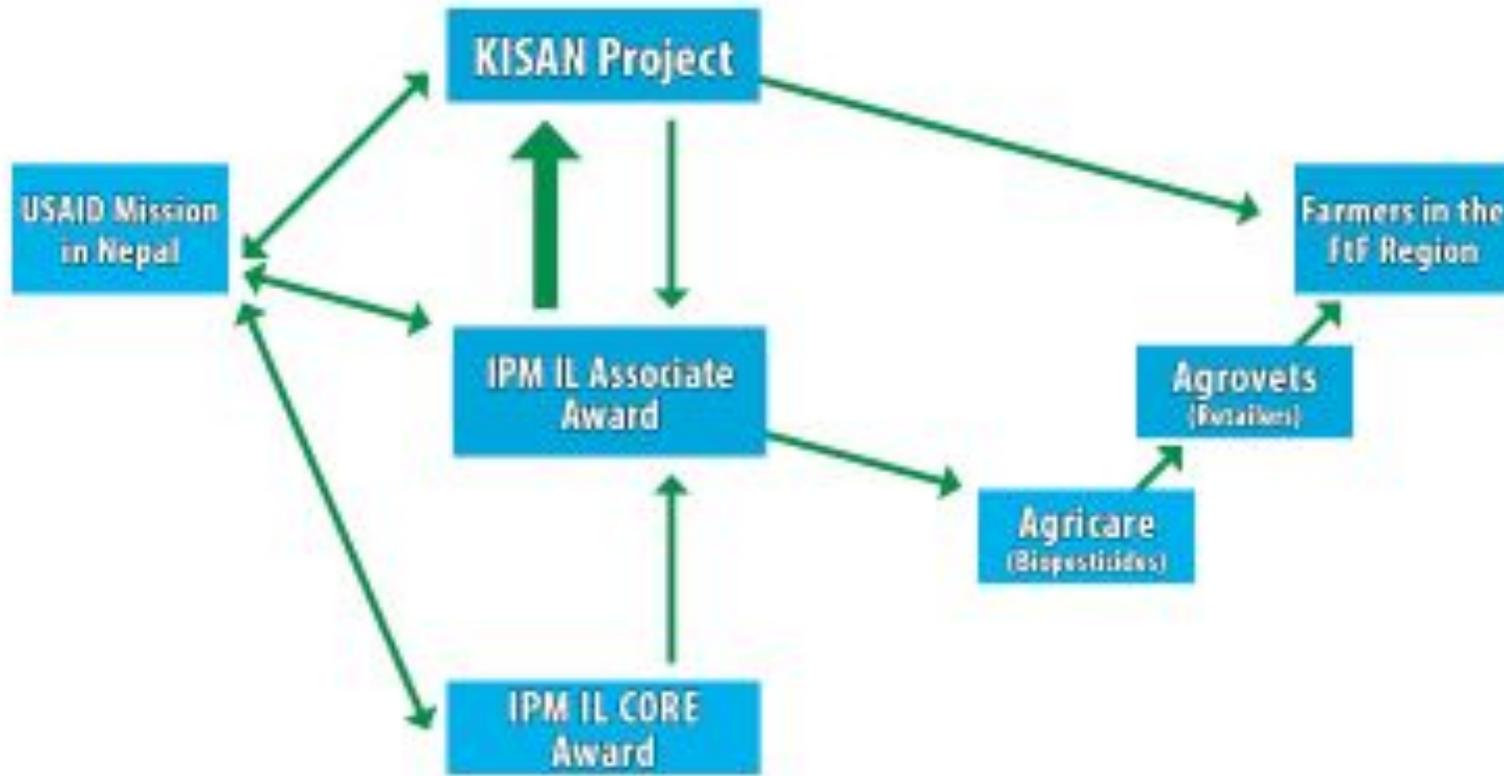


Parasitoid release in the field

Pearl millet damaged by headminer



Technology Transfer of Trichoderma in Nepal





Thank You