Stage 2: Pest Risk Assessment Probability of Introduction (entry)

Stages of PRA

- Stage 1: Initiation
- Stage 2: Assessment of Pest Risk
  - Step 1: Pest Categorization
  - **Step 2: Assessment of the Probability of Introduction (<u>entry</u> & establishment) and Spread**
  - Step 3: Impacts
  - Step 4: Overall Assessment of Risk
  - Step 5: Uncertainty
- Stage 3: Pest Risk Management
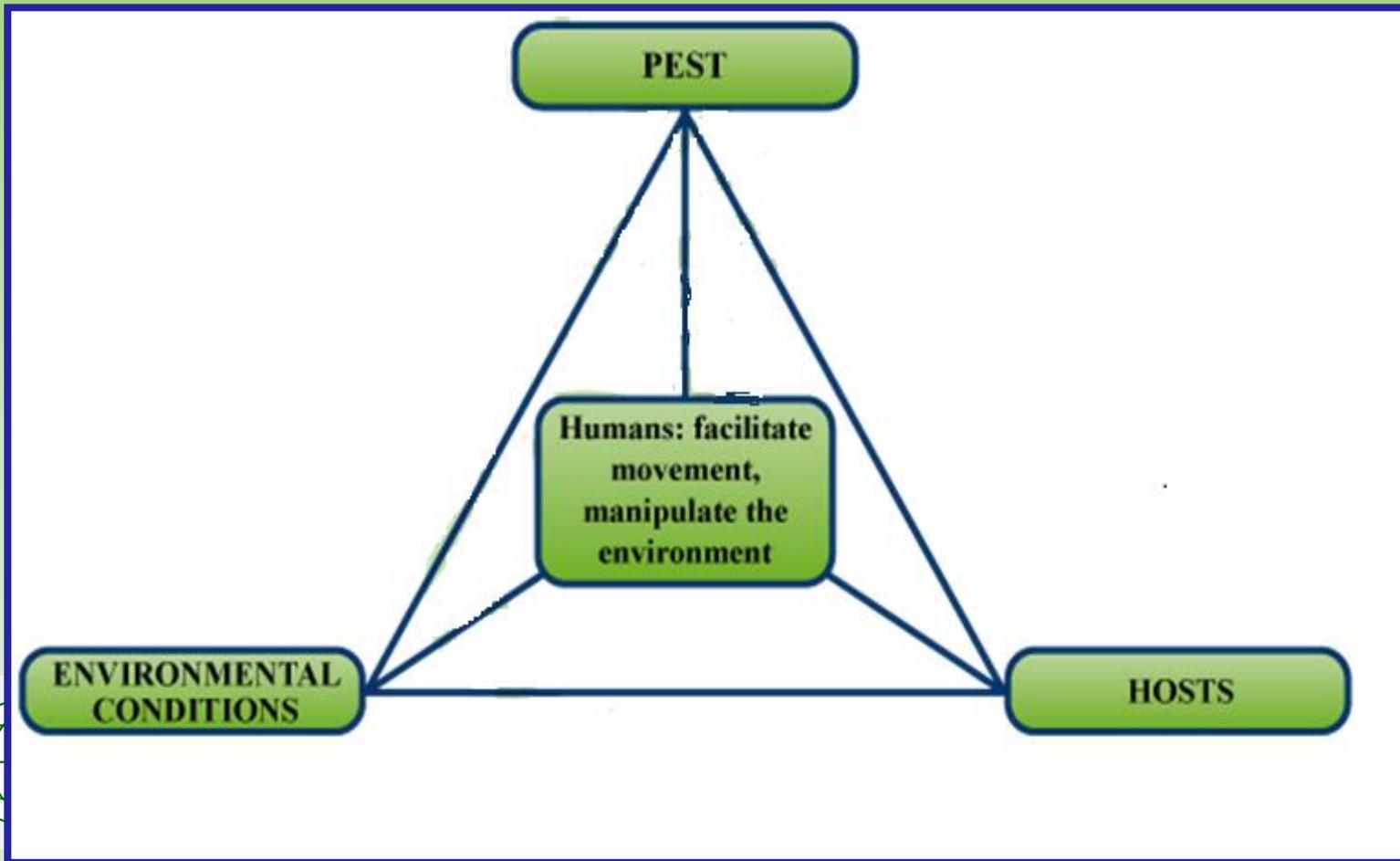
Definition of the concept of Introduction

- Defined as the **entry of a pest** resulting in its **establishment**

  (FAO, 190; revised FAO, 1995; IPPC. 1997

Pest Introduction

Definition of Entry

- The movement of a **pest** into an **area** where it is not yet present or is present but not widely distributed and being under **official control**

Probability of Pest Entry

- **Depends** on:

  – The **pathways** followed from the exporting country

  – The **frequency and quantity** of pests associated with the pathway

Probability of Pest Entry

- **Determined** by:
  - Pathways followed by the pest for entry

  - probability of pest being associated with the pathway at origin

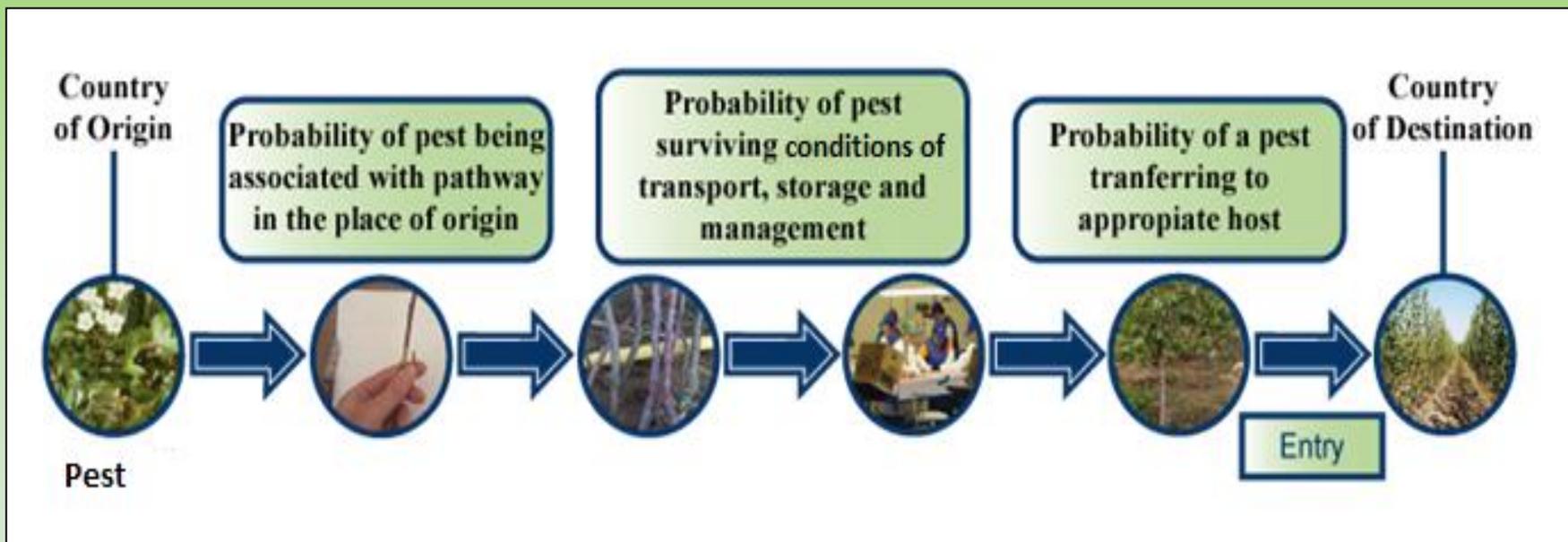 - Probability of pest surviving transport and storage

Probability of Pest Entry

- **Determined by**:

- Probability of pest surviving existing pest management procedures (including phytosanitary inspection

- Probability of transfer to a suitable host

Probability of Pest Entry

Country of Origin → Probability of pest being associated with pathway in the place of origin → Probability of pest surviving conditions of transport, storage and management → Probability of a pest tranferring to appropiate host → Country of Destination

Pest

Entry

Probability of Pest Entry

- **Determined** by:
  - **Pathways followed by the pest for entry**
  - probability of pest being associated with the pathway at origin
  - Probability of pest surviving transport and storage

What is a pathway?

- A pathway allows **entry** or **spread** of a **pest.** Describe the pathway
  - use scientific names (pest / host)
  - Source (origin)
  - intended use
    - timing
    - volume
    - other details, e.g. of production

Identification of pathways

- Consider man-made (human-assisted) pathways
  - e.g. with host plant / host commodity
  - with soil associated with imported nursery stock
  - contaminating seeds and grain (commodities)
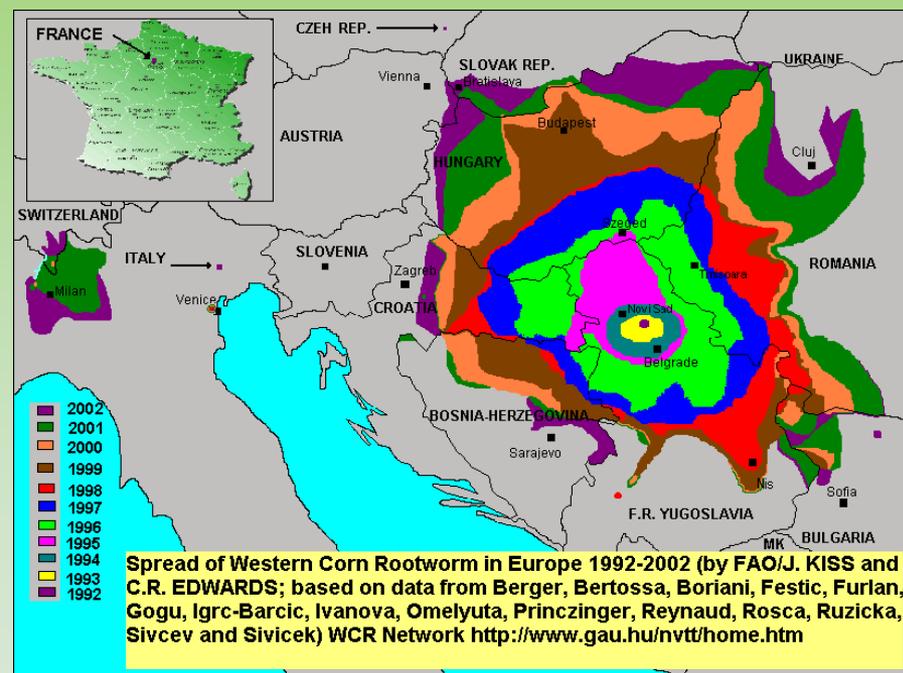
Identification of pathways

- Consider forms of transport, commodities, or associated products

  - e.g. with wood packaging (associated products)

  - in shipping containers / rail cars (transport)

Identification of pathways

- Consider natural spread as a mechanism for entry

    - e.g. terrestrial dispersal

    - via wind or water

| 2002 |
| 2001 |
| 2000 |
| 1999 |
| 1998 |
| 1997 |
| 1996 |
| 1995 |
| 1994 |
| 1993 |
| 1992 |

Spread of Western Corn Rootworm in Europe 1992-2002 (by FAO/J. KISS and C.R. EDWARDS; based on data from Berger, Bertossa, Boriani, Festic, Furlan, Gogu, Igrc-Barcic, Ivanova, Omelyuta, Princzinger, Reynaud, Rosca, Ruzicka, Sivcev and Sivicek) WCR Network http://www.gau.hu/nvtt/home.htm

Describing a pathway

- Guava (*Psidium guajava*) fresh fruit Venezuela to Jamaica for consumption

- Potatoes (*Solanum tuberosum*) from Holland to Jamaica for processing into French fries

- Grape vines (*Vitis*) from Italy to Jamaica for planting and fruit production

Describing a pathway

- Fresh fruit carried by passengers on flights returning from Trinidad and Tobago.

Probability of Pest Entry

- **Determined by:**
  - **Pathways followed by the pest for entry**
  - **probability of pest being associated with the pathway at origin**
  - Probability of pest surviving transport and storage

Association with pathway at origin

- Probability of the pest being in/on a pathway depends on

  - Prevalence of the pest in country of origin

  - Probability of the pest surviving agriculture or commercial practices in country of origin

  - Occurrence of the pest in life stage associated with the commodity

Association with pathway at origin

- Probability of the pest being in/on a pathway depends on

  - Volume and frequency of movement along the pathway

  - Seasonal timing

  - Pest management and phytosanitary procedures applied in country of origin

Probability of Pest Entry

- **Determined by:**
  - Pathways followed by the pest for entry
  - probability of pest being associated with the pathway at origin
  - **Probability of pest surviving transport and storage**

Survival during transport

- Probability the pest will survive during transport should consider
  - – Length of time in transport
  - – Robustness of life stages present during transport or storage
  - – Number of individuals, spores or propagules involved
  - – procedures applied to consignments during transport (e.g. cold storage)

Probability of Pest Entry

- **Determined by**:

- **Probability of pest surviving existing pest management procedures (including phytosanitary inspection**

- Probability of transfer to a suitable host

Surviving existing management procedures

- Existing phytosanitary measures need consideration

  - The probability that the pest will go undetected during inspection or survive other existing phytosanitary measures should be assessed

  - Measures applied against other pests should be assessed for possible effectiveness for pest in question

Quarantine inspections

Pest identification

Probability of Pest Entry

- **Determined by**:

- Probability of pest surviving existing pest management procedures (including phytosanitary inspection

- **Probability of transfer to a suitable host**

Transfer to suitable host

- Probability of transfer to suitable host or habitat depends upon
  - Intended use of the commodity
  - Dispersal mechanisms (including vectors)
  - Proximity of entry, transit and destination points to suitable hosts or habitats

Summary

- Entry as part of the PRA process
- What a pathway is
- Identifying and describing pathways
- Factors influencing entry
  - Origin, transport, transfer
- Information sources