Stage 2: Pest Risk Assessment

Probability of Spread

Stages

- Stage 1: Initiation
- Stage 2: Pest Risk Assessment
  - Step 1: Pest Categorization
  - **Step 2: Assessment of the Probability of Introduction (entry, establishment) and Spread**
  - Step 3: Impacts
  - Step 4: Overall Assessment of Risk
  - Step 5: Uncertainty
- Stage 3: Pest Risk Management

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Probability of Spread

- **Spread** is defined as the expansion of the geographical distribution of a **pest within** an **area**

- Spread potential is important in determining how quickly impact is expressed and how readily a pest can be contained

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Probability of Spread

- In the case of intentionally imported plants, the assessment of spread concerns spread from the intended habitat or the intended use to an unintended use

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Probability of Spread

- To estimate the probability of spread of a pest, reliable biological information should be obtained from the areas where it currently occurs.

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Probability of Spread

- The next step is to carefully compare conditions in the PRA area with those in the area where the pest is currently present and consult expert judgement to assess the probability of spread

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Probability of Spread

- In assessing spread potential, the Analyst must consider the species:-
  - Means of spread
    - How does spread occur?
  - Rate of spread
    - How fast?
  - Magnitude of spread
    - How far?

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Rate and Magnitude of Spread

- Probability of spread influences
  - Scale of potential impacts
  - Urgency of potential responses
  - Survey design
  - Potential success of any future control or eradication program

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Factors influencing spread

- Suitability of environment
- Biology of the pest
- Presence of natural barriers
- Intended end use of the commodity
- Production / harvesting practices
- Vectors
- Natural enemies
- History elsewhere

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Factors influencing spread

- Suitability of environment
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- Intended end use of the commodity
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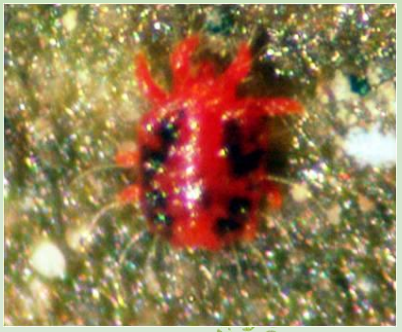

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Factors influencing spread

- Suitability of environment √
- Biology of the pest
- Presence of natural barriers
- Intended end use of the commodity
- Vectors
- Natural enemies
- History elsewhere

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Factors influencing spread

- Suitability of environment √
- Biology of the pest √
- Presence of natural barriers
- Intended end use of the commodity
- Vectors
- Natural enemies
- History elsewhere

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Factors influencing spread

- Suitability of environment √
- Biology of the pest √
- Presence of natural barriers √
- Intended end use of the commodity
- Vectors
- Natural enemies
- History elsewhere

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Factors influencing spread

- Suitability of environment √
- Biology of the pest √
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Factors influencing spread

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- Biology of the pest √
- Presence of natural barriers √
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- Natural enemies √
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Factors influencing spread

- Suitability of environment √
- Biology of the pest √
- Presence of natural barriers √
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Using the Red Palm Mite experience to predict behaviour of other species

- Predicting spread of related or similar organisms
  - Species X is expected to behave much as did Red Palm Mite

- Comparison with dissimilar organisms
  - Species Y will spread faster & further than Red Palm Mite, e.g., a rust of field crops
  - Species Z will spread more slowly & less far than Red Palm mite , e.g., a root-feeding nematode

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- Looking back is easy
- Understand why spread occurred as it did

- Pest risk assessment looks forward
- Much more challenging

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How to assess spread

- Comparative analysis
  - qualitative
- Predictive Models
  - semi-quantitative or quantitative
- Useful information sources
  - Case histories of comparable pests
  - Assessments and information from areas where the pest is present
  - Life history information
  - Site information
  - Expert opinion

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Conclusion

- Means of spread
  - How?
- Rate of spread
  - How fast?
- Magnitude of spread
  - How far?

- Life history
- Area of origin factors
- PRA Area factors
- Human factors

- Compare to other pests
- Compare to other places

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