

Common diseases of vegetable crops and their management

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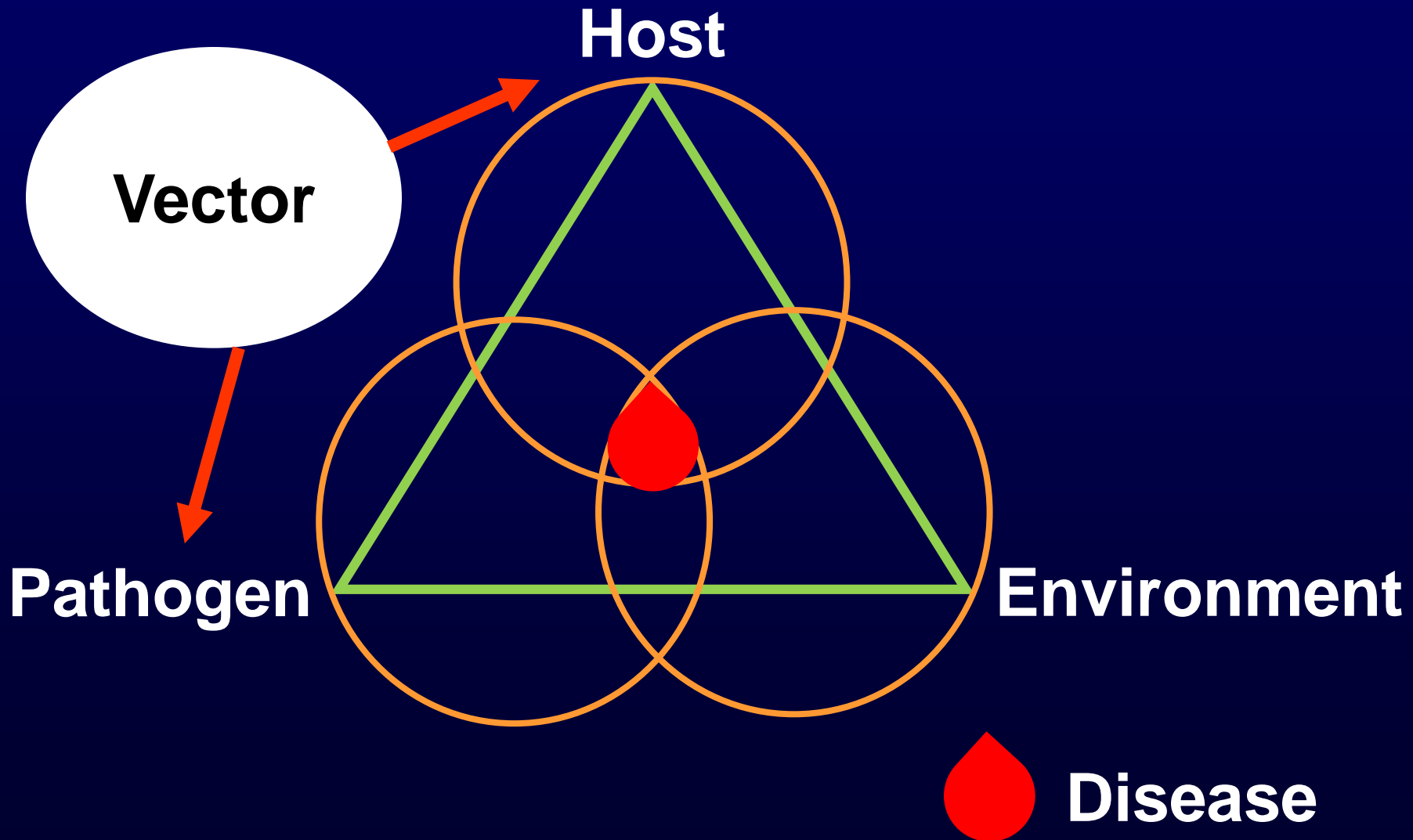
Vegetable production process

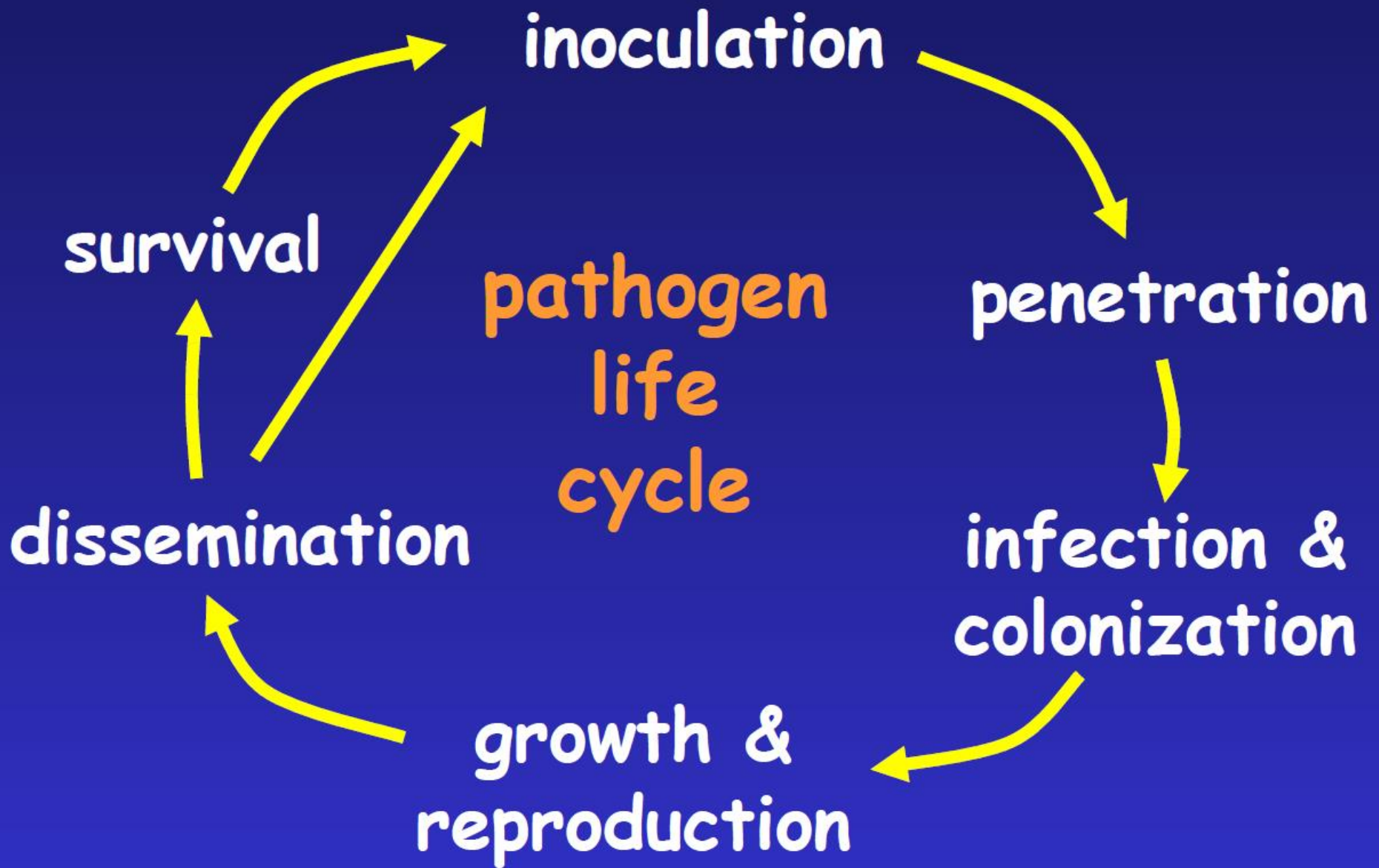


Important terminologies

- Pathogens: biological agents that cause disease
- Symptoms: visible reaction of plant to infection by disease-causing pathogen
- Inoculum: part of a pathogen capable of infecting the host plant to cause the disease (e.g. spore, mycelium, bacterial cell, virus particle)
- Vector: an organism capable of pathogen transmission

Concept of disease triangle





Modes of pathogen spread

- Common modes of spread include
 - Soil: mostly fungi, bacteria and nematodes
 - Seeds (including vegetative propagules)
 - Insect and nematode vectors: mostly virus and virus-like organisms
 - Wind: mostly fungi, wind-driven pollen- and insect-transmitted viruses
 - Water: mostly fungi and bacteria
 - Human activity

Diseases caused by soilborne pathogens

Major attributes

- Pathogen inoculum can survive in soil for many years
- Inoculum may also persists in debris from infected plants but not in soil
- Pathogen groups involved: fungi (including oomycetes), bacteria, nematodes
- Viruses may be 'soilborne' when vectored by soilborne organism
- Can affect all plant parts
- Field distribution of disease often patchy

Common examples

- Fungal rots caused by species of Phytophthora, Rhizoctonia, Fusarium, Verticillium, Macrophominia, etc.
- Bacterial rots caused by species of Erwinia, Streptomyces, Xanthomonas, Pseudomonas, etc.
- Nematodes such as Pratylenchus, Xiphenema and Meloidogyne
- Nematode-transmitted viruses such as tomato and tobacco ringspot viruses

Fusarium wilt of watermelon





Onion pink root

Inoculum can persist in
soil for up to 5 years



Vine decline of cucurbits due to monosporascus root rot



Bacterial speck on tomato due to *Pseudomonas syringae*



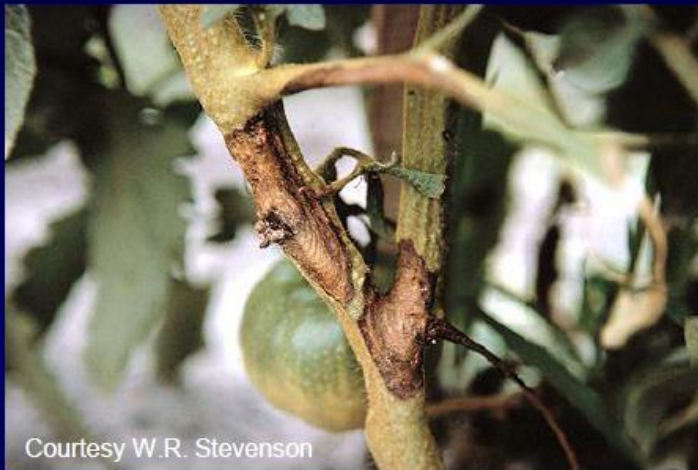
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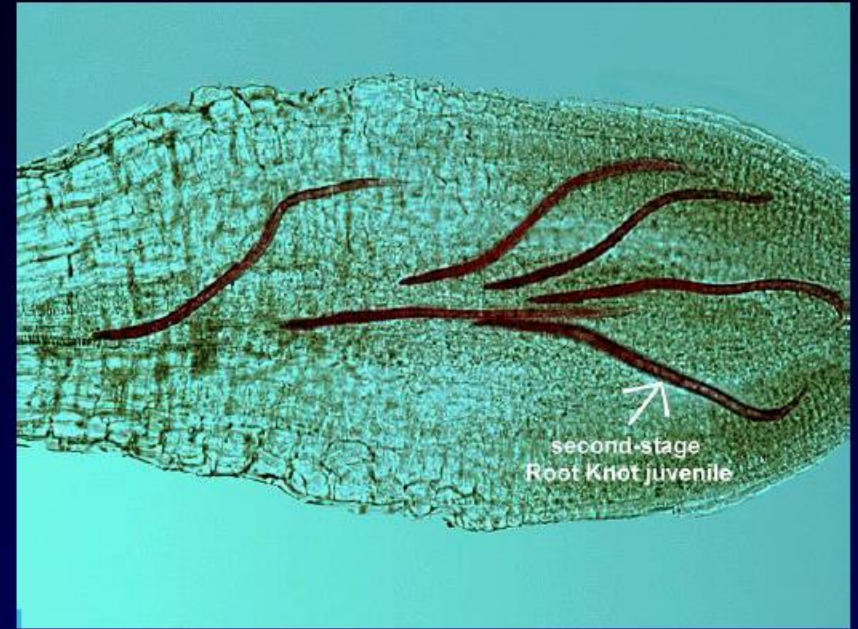
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Early blight of tomato



Root-knot nematodes



<http://nematology.umd.edu/rootknot.html>



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Management

- Pay attention to cropping history of soil
- Plant resistance or tolerant cultivars
- Plant in well-drained soils
- Avoid overwatering especially during warm weather
- Practice proper field sanitation
- Practice crop rotation
- Apply pre-plant fungicides or fumigants