



Diseases of Soybean

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Rhizoctonia blight

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Causal
organism

Rhizoctonia aerial blight / Web blight:
Rhizoctonia solani

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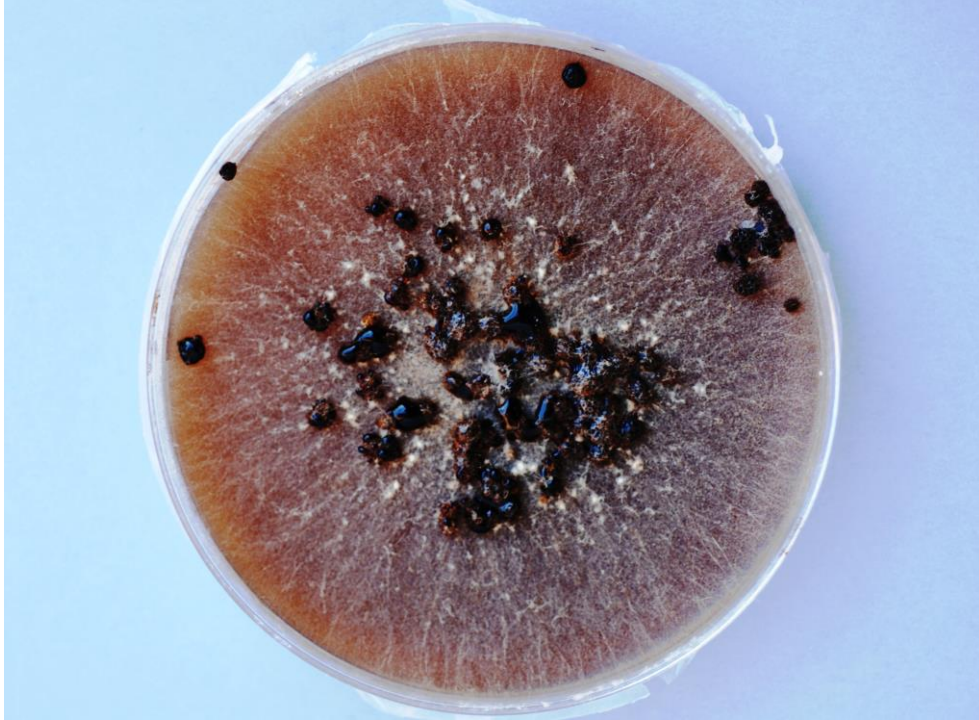
Symptom

- Infected seeds have irregularly shaped tan or light brown sunken lesions.
- Infected leaves appears as water soaked at first instance. They soon take on a greenish brown to reddish brown appearance.
- The infected portion later turns tan brown or black in colour.
- Under high rainfall or high humid conditions, a web like mycelial growth of fungus forms on the leaves.
- Dark brown sclerotia are formed on leaves and petioles.



Etiology

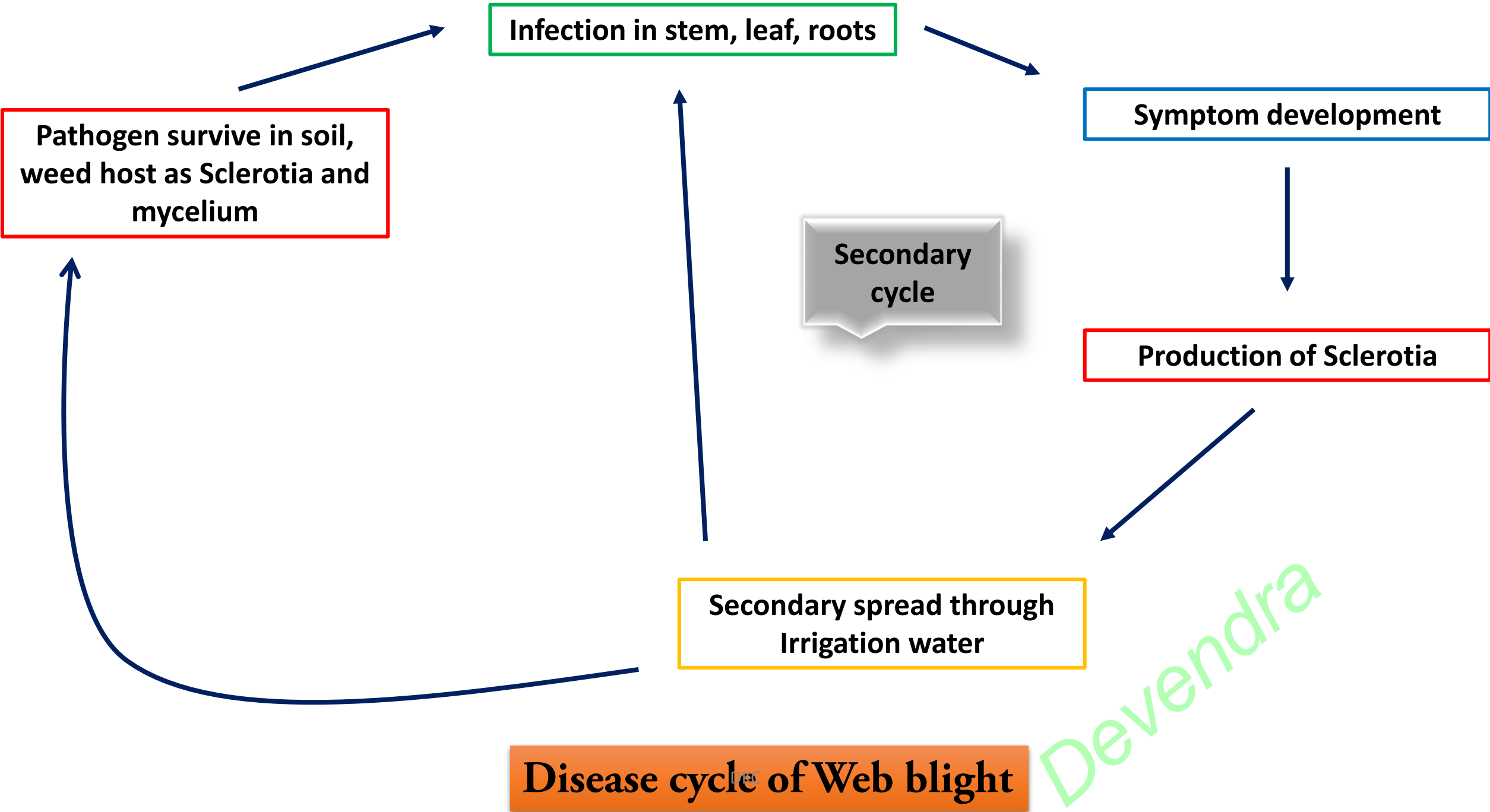
- The fungus produces usually long cells of septate mycelium which are hyaline when young, yellowish brown when old.
- It produces large number of globose **sclerotia**, which are initially white, later turn to brown or purplish brown.
- Branching in mycelium in right angle



Disease cycle

- The pathogen survives as sclerotia in soil.
- Humid and cool (24-32° C) are favourable weather condition.

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Epidemiology

- High relative humidity (96-97 per cent),
- high temperature (30-32° C),
- closer planting and
- heavy doses of nitrogenous fertilizers.

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Management

- Avoid dense planting.
- Completely cover plant residue by clean ploughing the field soon after harvest.
- Destroy infected stubble.
- Seed treatment with Thiram + Carbendazium (2:1) @ 3g/kg seed.
- Use Mancozeb or copper fungicide at 2.5gm/l or carbendazim 1 g/lit.

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Bacterial spot

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A petri dish held by a gloved hand, showing a bacterial culture with yellowish, circular colonies on a white agar surface. The colonies are arranged in a grid-like pattern, with some larger, more confluent areas. The background is blurred, showing laboratory equipment.

Causal organism

Bacterial blight: *Pseudomonas syringae* pv. *glycinea*

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Symptom

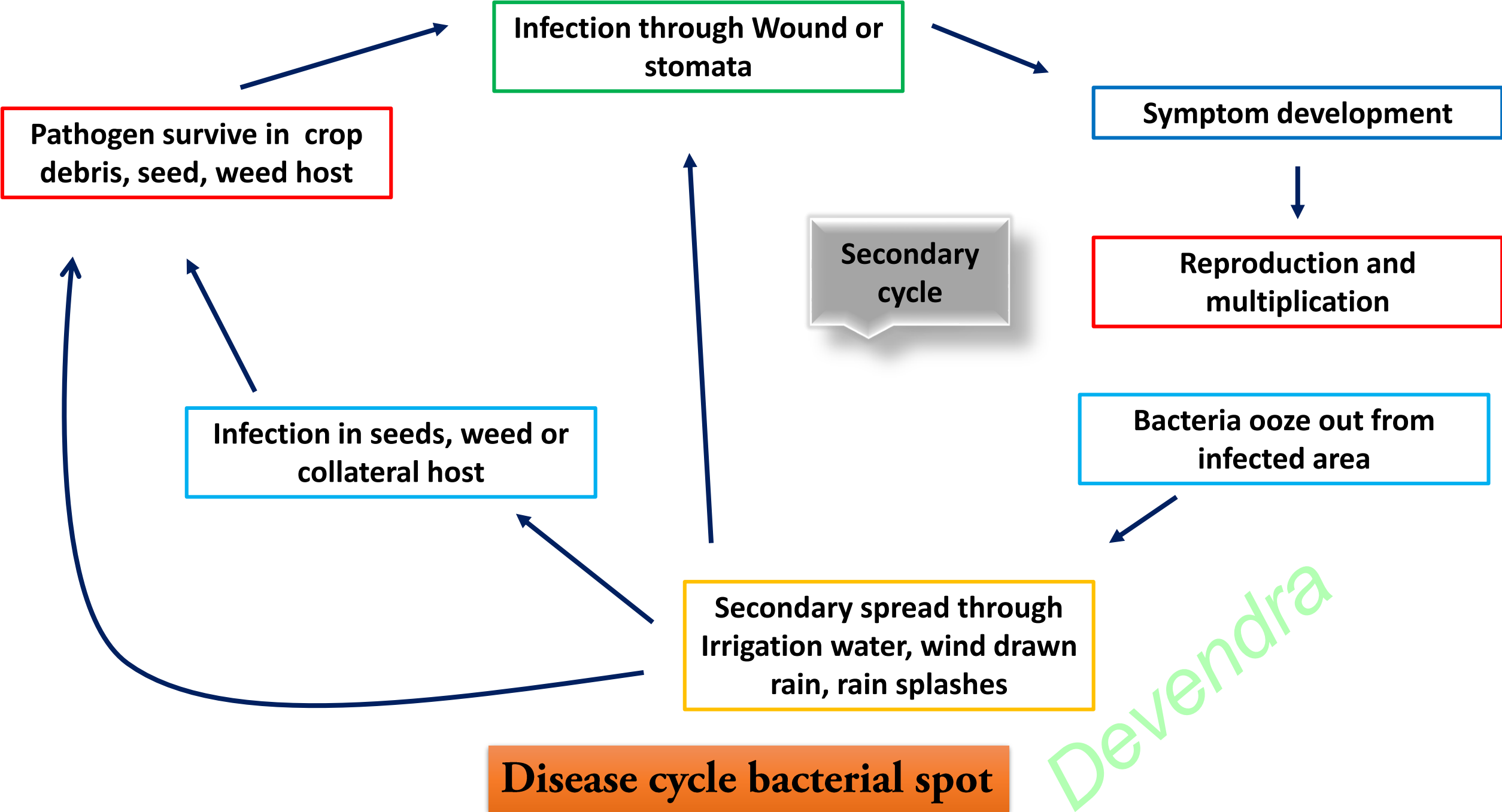
- Seeds may develop raised or sunken lesions and become shriveled and discolored.
- Small, angular, translucent, water-soaked, yellow to light brown spots appear on leaves.
- Young leaves are most infected and are destroyed, stunted and chlorotic.
- Angular lesions enlarge and merge to produce large, irregular dead areas.
- Early defoliation of lower leaves may occur.
- Large, black lesions develop on stems and petioles.



Etiology

- The bacterium is aerobic, gram negative, non spore forming, rod with size ranging from 1-2 x 0.8-1.0 micro mt
- monotrichous polar flagellum
- Bacterial colonies are circular, and creamy white





Epidemiology

- High dose on Nitrogen
- Dense planting
- Cloudy days
- Intermittent rain

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Management

- Deep summer poughing.
- Use healthy/certified seeds.
- Destroy infected crop debris
- Seed treatment with streptocyclin @ 250 ppm (2.5 g/10 kg seeds).
- Application of any copper fungicides @ 2 g/lit along with streptocyclin at the rate of 250 ppm (2.5 g/10 lit water).

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Seed and seedling rot



Causal organism

- Several different pathogens can cause these diseases, and the most common tend to be
 - ✓ *Fusarium*,
 - ✓ *Rhizoctonia*,
 - ✓ *Phytophthora*,
 - ✓ *Pythium*

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Symptom

- Pathogen attack and rot seeds prior to and after emergence, and can cause pre- and post- emergence damping off.
- It produces tan-brown, soft, rotted tissue.
- At the primary leaf stage , infected stems appear bruised and soft, secondary roots are rotted, the leaves turn yellow, and plants frequently wilt and die.



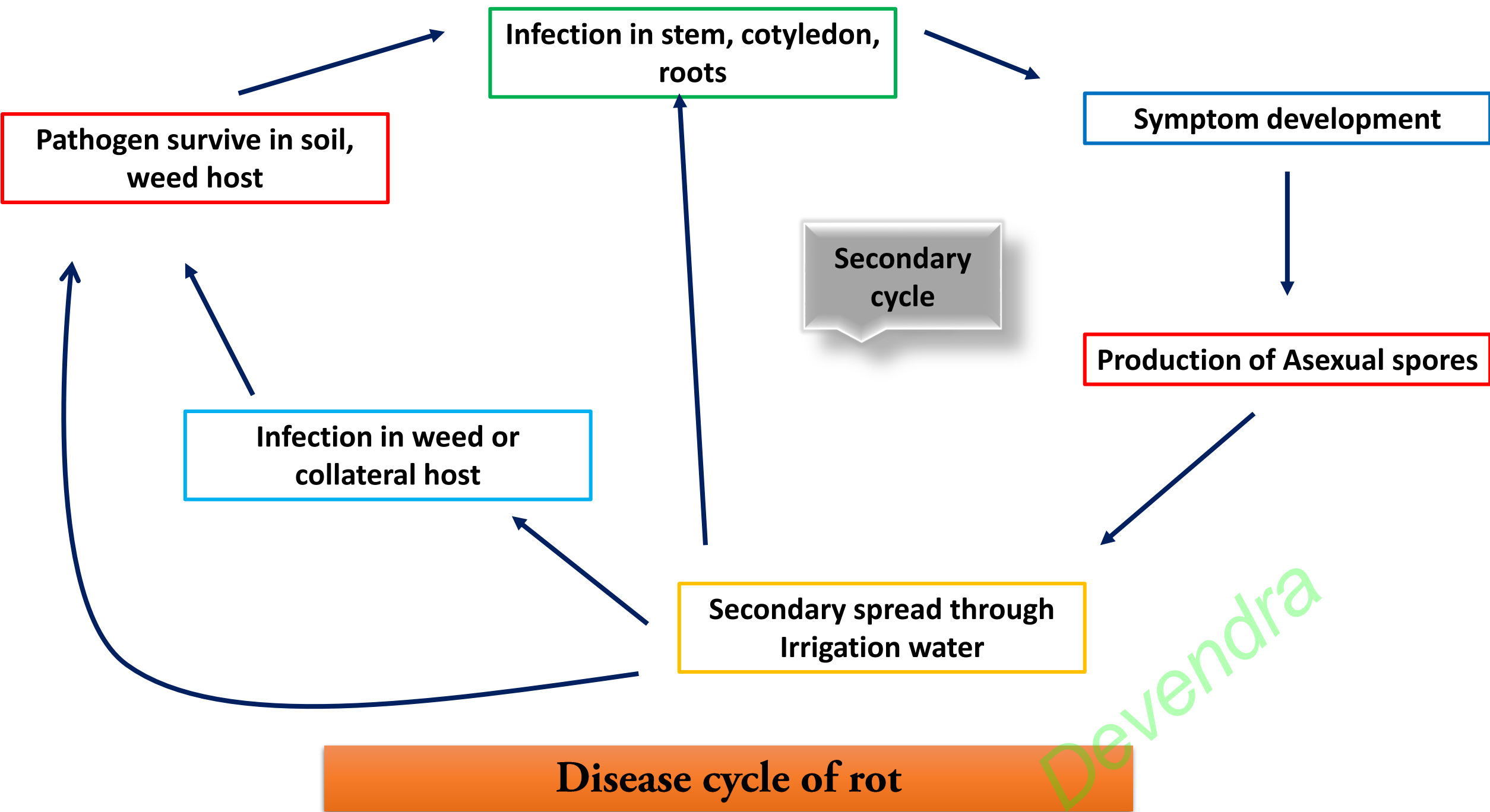
Etiology

- Fusarium -
- Rhizoctonia -
- Phytophthora -
- Pythium -

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Disease cycle

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Epidemiology

- High relative humidity
- closer planting and
- heavy doses of nitrogenous fertilizers
- Water logging condition
- Cloudy days

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Management

- Deep ploughing in summer.
- Ensure balanced fertilization of the crop.
- Rotate soybean with cereals.
- Maintain well drained field
- Destroy last years infected stubble.
- Seed treatment with *T. viride* @4g/kg or *P. fluorescens* @ 10g/ kg of seed or Carbendazim or Thiram 2g/kg of seed.
- Spot drenching with Carbendazim 1g/lit or *P. fluorescens* / *T. viride* 2.5 kg/ha with 50 kg FYM

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Soybean mosaic

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Causal organism

- *Soybean mosaic virus*

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Symptom

- Diseased plants are usually stunted with distorted (puckered, crinkled, ruffled, stunted, narrow) leaves.
- The plants are often stunted.
- Pods become Flattened or curved and contain fewer and smaller seed.
- Infected seeds gets mottled.
- Infected seeds fail to germinate or they produce diseased seedlings.

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Etiology

- *Soybean mosaic virus*
- Genome – SS-RNA (Positive sense)
- Capsid – Flexious rod shaped (750 × 12 nm)
- Transmission – Aphid and mechanical

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Disease cycle

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Virus survive in collateral
and weed host

Non- viruliferous insect feed
on infected plant and
become viruliferous

Multiplication of Virus in
Plant

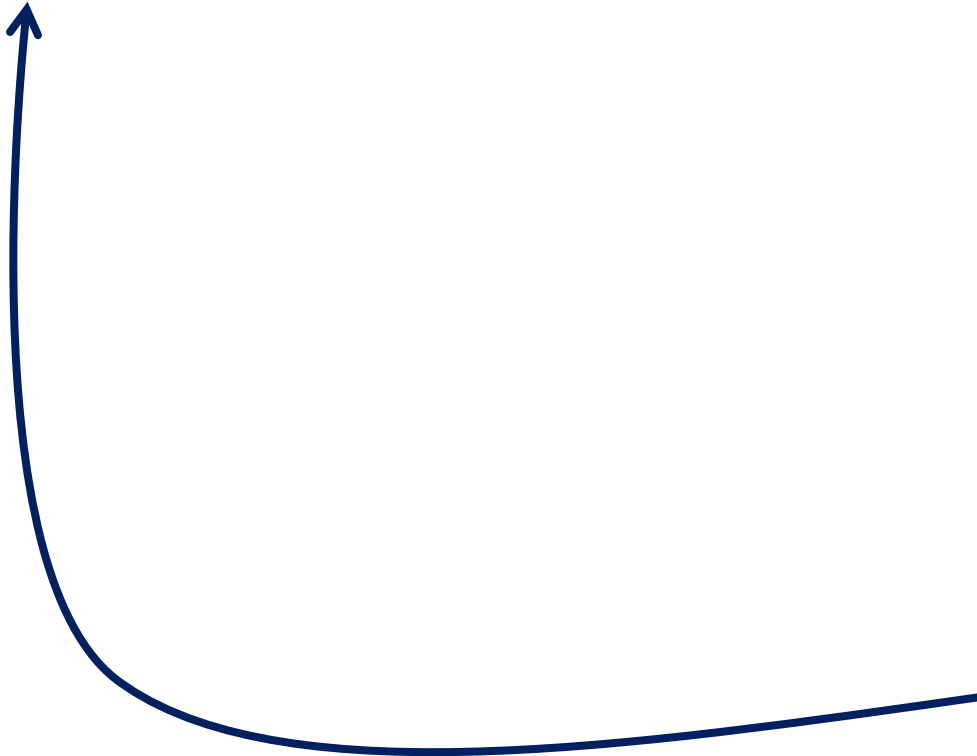
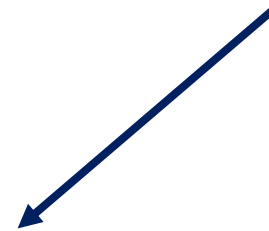
Secondary
cycle

Symptom development

Non- viruliferous insect feed
on infected plant and
become viruliferous
Or by contact

Disease cycle of Soybean mosaic

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Epidemiology

- Presence of virus
- Dense planting
- High dose of Nitrogenous fertilizer
- Variety susceptible to Insect
- High relative humidity
- Cloudy days

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Management

- Use healthy/certified seeds.
- Keep the field free from weeds.
- Rogue out infected plants and burn them
- Crop rotation
- Spray Imidacloprid
- Regular sterilization of farm implements
- Avoid dense planting

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**Thank
You**