Disease Management in Cole Crops and Crucifer Greens

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Major Diseases of Cole Crops and Crucifer Greens

- Alternaria Spot (Fungal)
- Black Leg (Fungal)
- Black Rot (Bacterial)
- Club Root (Fungal)
- Downy Mildew (Fungal)
- Fusarium Yellows (Fungal)
- Rhizoctonia Diseases (Fungal)
- Sclerotinia Rot (Fungal)
- Turnip Mosaic (Viral)

Major Diseases of Cole Crops and Crucifer Greens

- **Alternaria Spot (Fungal) –**
  Alternaria brassicae
  Alternaria brassicicola

Alternaria spot on leaves of cole crops

Alternaria Spot of Cole Crops and Crucifer Greens

- Pathogens are seed-borne
- Pathogens survive on plant debris
- Pathogens survive on winter Brassicas and crucifer weeds

Management of Alternaria Spot of Cole Crops and Crucifer Greens

- Plant pathogen-free seed
- Crop rotation for ≥3 years
- Bury plant debris
- Eliminated volunteers and weeds
- Use fungicides (Check Labels)
  - ✓ Chlorothalonil (e.g., Bravo)
  - ✓ Amistar/Quadris, Cabrio
  - ✓ Endura, Maneb, Rovral, Switch

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Major Diseases of Cole Crops and Crucifer Greens

- **Black Leg (Fungal) –**
  Leptosphaeria maculens
  (*Phoma maculens*)

Black leg of cole crops

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Black Leg of Cole Crops

- Pathogen is seed-borne
- Pathogen survives on plant debris
- Moisture is favorable for disease development
- Is not a major disease of leafy green

Management of Black Leg of Cole Crops

- Plant pathogen-free seed
- Crop rotation for ≥3 years
- Bury plant debris after harvest
- Grow in fields with no black leg history
- Use fungicides (Check Labels)
  - ✓ Cabrio
  - ✓ Rovral

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Major Diseases of Cole Crops and Crucifer Greens

- **Black Rot (Bacterial) –**
  Xanthomonas campestris
  pv. *campestris*

Black rot of cole crops

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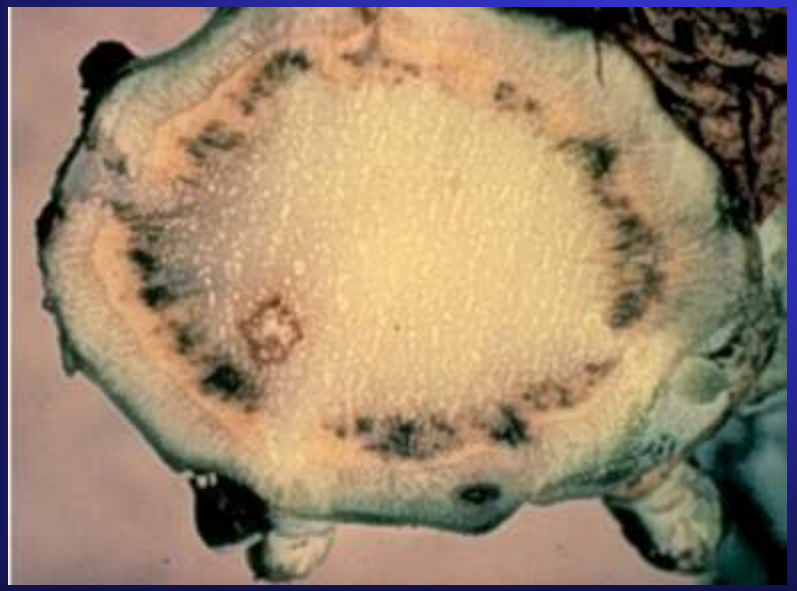

Black rot of cole crops

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Black Rot of Cole Crops and Crucifer Greens

- Pathogen is seed-borne (Very Important)
- Pathogens survive on plant debris
- Pathogen spread by splashing water, insects, and workers

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Management of Black Rot of Cole Crops and Crucifer Greens

- Plant pathogen-free seed
- Plant disease-free seedlings
- Plant resistant cultivars (cabbage)
- Crop rotation is useful
- Actigard may suppress disease development

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Major Diseases of Cole Crops and Crucifer Greens

- **Club Root (Fungal) -** ***Plasmodiophora brassicae***

Club root of cole crops

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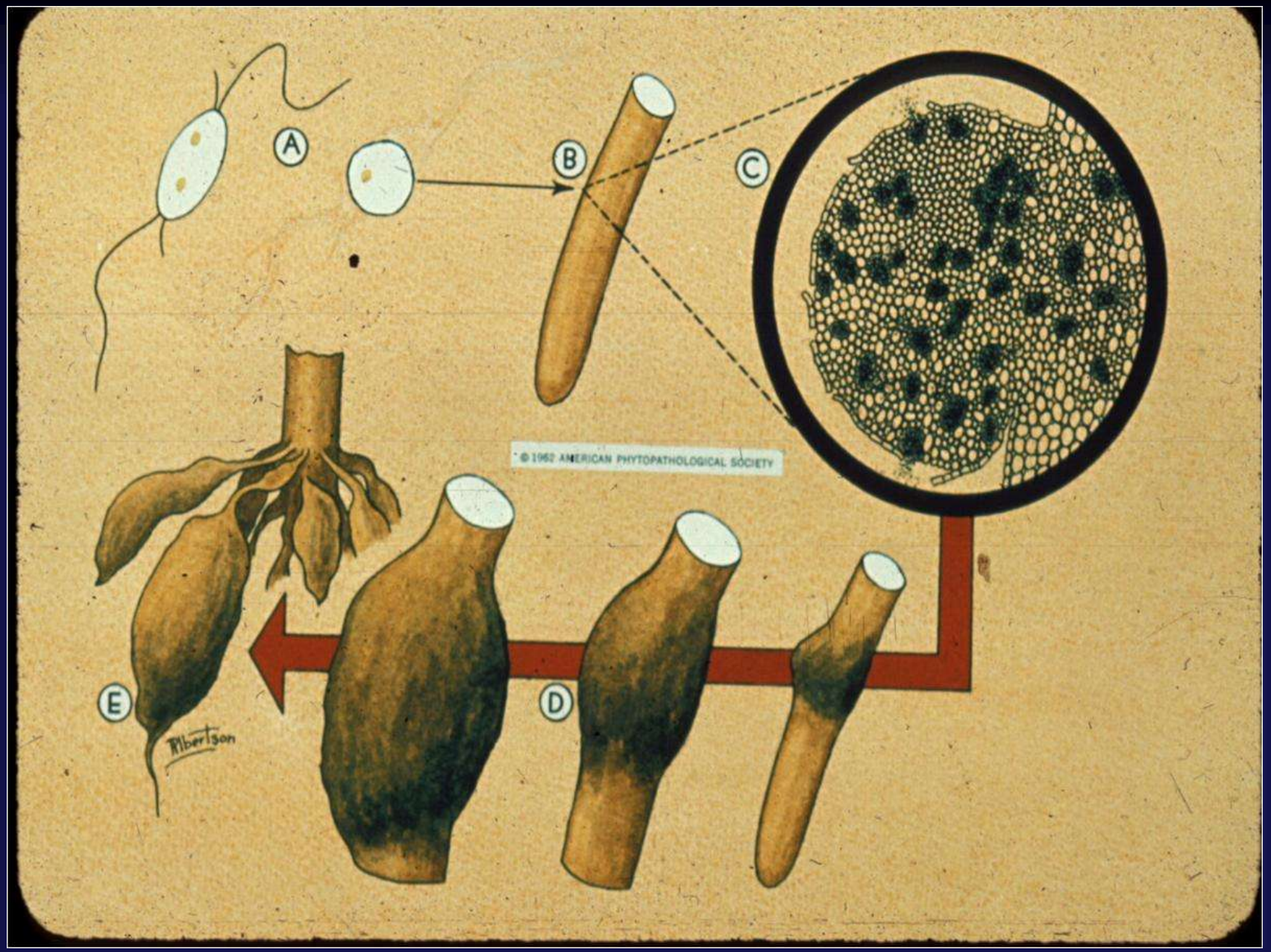

Club root of cole crops

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Club Root of Cole Crops and Crucifer Greens

- Pathogen is a soil-borne organism
- Pathogens has several races
- A common disease in acidic soils
- Infected plants are not killed
- Soil moisture favors disease development

Management of Club Root of Cole Crops and Crucifer Greens

- Grow resistant cultivars (cabbage), when available
- Increase soil pH to 7.3-7.5 by liming
- Crop rotation of ≥ 3 year
- Avoid poorly drained soil
- Fungicide [e.g., Terraclor (PCNB)] may suppress disease development

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Major Diseases of Cole Crops and Crucifer Greens

- **Downy Mildew (Fungal) -** ***Peronospora parasitica***

Downy mildew of cole crops

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Downy Mildew of Cole Crops and Crucifer Greens

- Pathogen survives in winter crops, also in biennial crops
- Pathogen produces oospore
- Cole and moist conditions favor disease development
- Spores spread by wind in long distance

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Management of Downy Mildew of Cole Crops and Crucifer Greens

- Grow resistant cultivars (broccoli)
- Minimize moisture in the canopy
- Fungicide application
  - ✓ Chlorothalonil (e.g., Bravo)
  - ✓ Phosphorous acid fungicides (e.g., ProPhyt, Agri-Fos, Phostrol)
  - ✓ Revus
  - ✓ Quadris, Amistar, Cabrio

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Major Diseases of Cole Crops and Crucifer Greens

- **Fusarium Yellows (Fungal) -**
  Fusarium oxysporum
  f.sp. *conglutinans*

Fusarium yellows of cole crops

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Fusarium Yellows of Cole Crops and Crucifer Greens

- Pathogen is a soil-borne fungus
- Pathogen spread by soil, water, and farm machinery

Management of Fusarium Yellows of Cole Crops and Crucifer Greens

- Grow resistant cultivars
- Long-term crop rotation

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Major Diseases of Cole Crops and Crucifer Greens

- **Rhizoctonia Diseases (Fungal) - *Rhizoctonia solani***

  Wire Stem and Bottom Rot

Wire stem (Rhizoctonia infection) of cole crops

Rhizoctonia infection of cole crops

Rhizoctonia infection of Cole Crops and Crucifer Greens

- Pathogen survives as sclerotia in soil and mycelium in plant debris
- Pathogen spread by soil, water, and farm machinery
- Disease favored by moisture

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Management of Rhizoctonia infection of Cole Crops and Crucifer Greens

- Crop rotation of ≥ 3 years
- Avoid poorly drained soils
- Minimize moisture in the canopy
- Fungicide application (check label)
  - ✓ Endura (boscalid)
  - ✓ Terraclor (PCNB)

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Major Diseases of Cole Crops and Crucifer Greens

- **Sclerotinia Rot (Fungal) -** ***Sclerotinia sclerotiorum***

Sclerotinia rot (white mold) of cole crops

Sclerotinia Rot of Cole Crops and Crucifer Greens

- Pathogen survives as sclerotia in soil
- Pathogen produces apothecia and ascospores
- Ascospores are wind-borne
- Pathogen has broad host-range
- Disease is favored by moisture

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Management of Sclerotinia Rot of Cole Crops and Crucifer Greens

- Crop rotation of ≥ 3 years
- Avoid poorly drained soils
- Minimize moisture in the canopy
- Fungicide application (check label)
  - ✓ Endura (boscalid)

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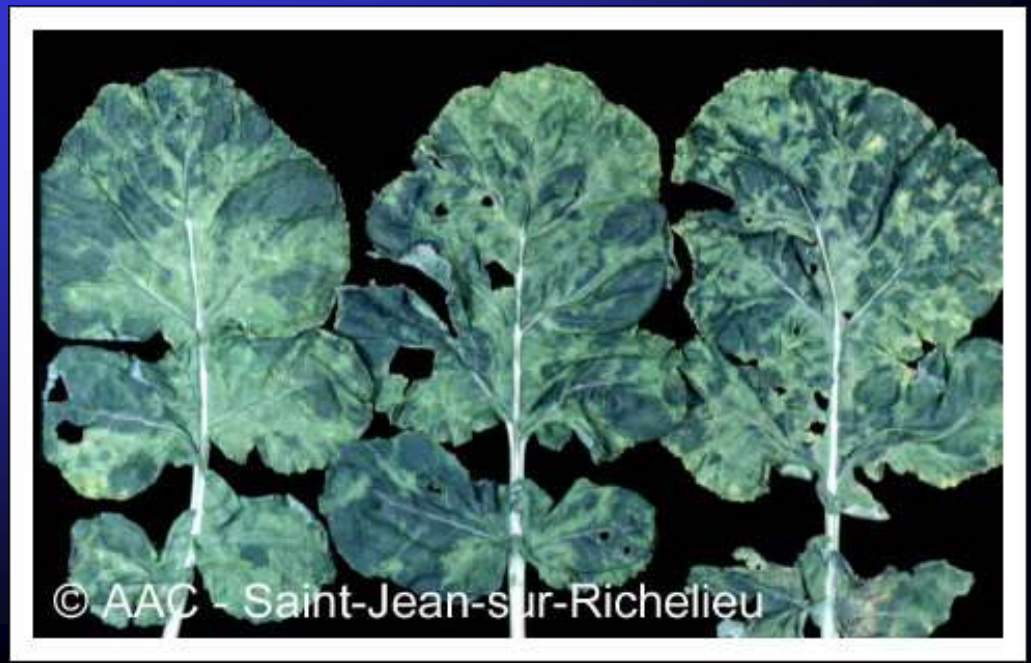
Major Diseases of Cole Crops and Crucifer Greens

- **Turnip Mosaic (Viral) -**
  Turnip mosaic virus

Turnip mosaic on cole crops



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Turnip mosaic on cole crops

Turnip Mosaic of Cole Crops and Crucifer Greens

- Pathogen is transmitted by larvae and adult flea beetles of the genera *Phyllotreta* and *Psylliodes* in a nonpersistant fashion
- Pathogen has a broad host-range
- Pathogen is NOT a seed-borne virus

Management of Turnip Mosaic of Cole Crops and Crucifer Greens

- Control insect vectors by insecticides

Questions