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) – 
  \textit{Alternaria brassicae} \\
  \textit{Alternaria brassicicola}

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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
Major Diseases of Cole Crops and Crucifer Greens

- Black Leg (Fungal) – *Leptosphaeria maculans* (*Phoma maculans*)
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
Major Diseases of Cole Crops and Crucifer Greens

- Black Rot (Bacterial) – *Xanthomonas campestris pv. campestris*
Black rot of cole crops
Black rot of cole crops
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
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
Major Diseases of Cole Crops and Crucifer Greens

- Club Root (Fungal) - *Plasmodiophora brassicae*
Club root of cole crops
Club root of cole crops
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
Major Diseases of Cole Crops and Crucifer Greens

- Downy Mildew (Fungal) - *Peronospora parasitica*
Downy mildew of cole crops
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
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
Major Diseases of Cole Crops and Crucifer Greens

- Fusarium Yellows (Fungal) - *Fusarium oxysporum* f.sp. *conglutinans*
Fusarium yellows of cole crops
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
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
Management of Rhizoctonia infection of Cole Crops and Crucifer Greens

- Crop rotation of $\geq 3$ years
- Avoid poorly drained soils
- Minimize moisture in the canopy
- Fungicide application (check label)
  - Endura (boscalid)
  - Terraclor (PCNB)
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
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)
Major Diseases of Cole Crops and Crucifer Greens

- Turnip Mosaic (Viral) - *Turnip mosaic virus*
Turnip mosaic on cole crops
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 nonpersistent 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