Diseases of Beetroot

1) CERCOSPORA LEAF SPOT

- **Symptoms:**
  The characteristic symptoms include, discrete circular lesions, 3-5 mm in diameter, with a necrotic center and reddish to dark brown margin (.-1) and in case of severe infection, the petioles are also infected.
- The spots are scattered at first but in case of severe attack they coalesce and cover the entire leaf blade and affect the quality and yield of seeds.
- In seed crop, all the above ground parts including seed clusters are affected.

Causal Organism: *Cercospora beticola* Sacc.

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CERCOSPORA LEAF SPOT

- **Disease cycle and epidemiology:**
  The fungus perpetuates in infected plant debris as mycelium or on the seed.
- The infected seeds result in infected seedlings.
- In the spring, overwintering mycelium in plant refuse starts producing conidia which are disseminated by wind currents, rain splashes and insects to the leaves.
- High relative humidity is an essential pre-requisite to sporulation.
- The conidial germination is best in the presence of free waters and moderate temperatures i.e. in between 15-32° C.
- **Management:**
  Collect and destroy the infected plant debris.
- Follow long crop rotations to prevent accumulation of soil borne inoculum.
- The resistance to Cercospora leaf spot has been found to be correlated with the 3-hydroxytyramine content of the leaves.
- Variety Desperzpoly RC has been reported as resistant to this disease besides giving highest tuber yield as well as sucrose content.
- Spray the crop with carbendazim or benomyl or thiophanate methyl (0.1%) and repeat at 20 days interval.

- **2. POWDERY MILDEW**

  Symptoms:

  The disease initially appears on the lower leaves and gradually spreads towards the top.
- The formation of first white, later grey-tan mildew areas on both the sides of the leaf characterize the disease.
- In general, infection is more on the upper surface of the leaf.
- In advanced stages of the disease development, mildew patches enlarge and coalesce and the leaf appears as if dusted with wheat flour.
- Severely affected leaves turn yellow and ultimately dry up.
- In favourable climatic conditions, cleistothecia develop as small dark round structures on the infected surface of the leaf.

Causal Organism: *Erysiphe betae* (Vanha) Weltzien.

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POWDERY MILDEW

- **Disease cycle and epidemiology:**
  Wherever cleistothecia of the fungus are formed, these serve as the possible mode of perpetuation.
- In normal situation, the pathogen survives from one season to other in conidial state either on the perennial weeds or on other related crops grown in the area.
- **Management:**
  The disease can be managed by spraying wettable sulphur (0.2%), benomyl or carbendazim or thiophanate– methyl (0.1%), or hexaconazole (0.05%) or difenoconazole (0.03%) as the disease starts appearing.

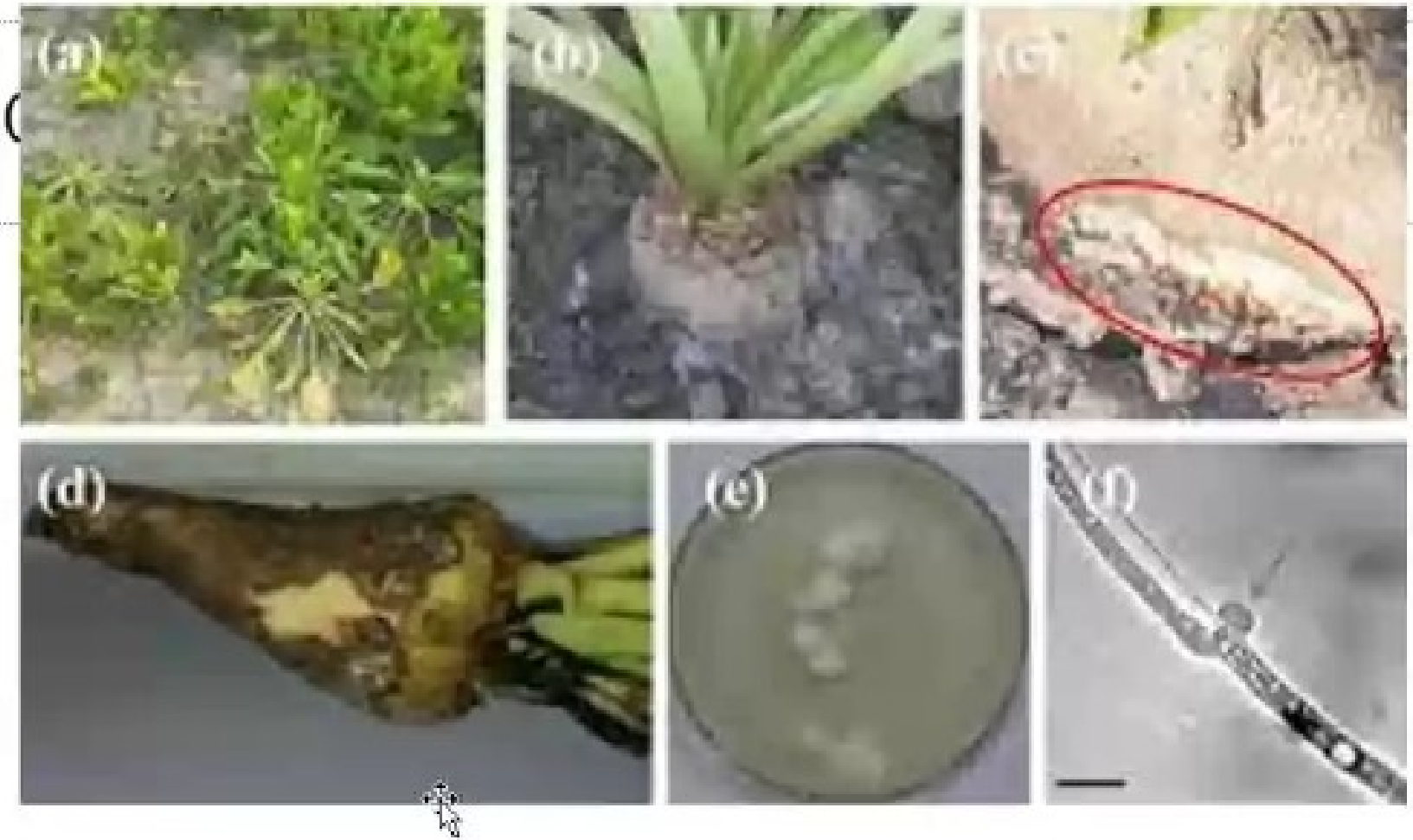
3. SCLEROTIUM ROOT ROT

Symptoms:

The disease is characterized by sudden rotting of mature roots below the soil surface.

- The affected root is usually covered with white mycelium that contains numerous brown sclerotia which is the most conspicuous sign of this disease.
- The fungal growth and sclerotia can be seen also in the soil around such roots.
- Later, when enough damage has been done to the roots, the leaves show yellowing and wilting and such plants can be easily pooled out.

Causal Organism: *Sclerotium rolfsii* Sacc.



SCLEROTIUM ROOT ROT

- **Disease cycle and epidemiology:**
  The fungus is soil borne in nature and can survive as saprophyte on crop debris.
- The fungus also produces sclerotia that are left in the field and germinate under favourable weather conditions and cause infections.
- High temperature and humidity favour the disease development.
- In the plains of India, sugar beet is usually grown on ridges and this practice is likely to stimulate disease incidence because the lower leaves become covered with soil resulting in a 'bridge' of dead tissue which furnishes an ideal medium for initiating pathogenesis.
- **Management:**
  Cultural practices like destruction of infected plant debris, crop rotation, deep summer ploughing, flooding, solarization during summer months etc. can be helpful in reducing the initial inoculum load in the field.
- Reduction in the incidence of root rot has also been recorded through the use of nitrogenous fertilizers including calcium nitrate, cyanamide and anhydrous ammonia, urea, ammonia sulphate and calcium ammonium.
- Drenching of ridge soil with carboxin and chloroneb at 2 and 15 kg/ 3000 l water/ha, respectively, significantly reduced root rot incidence and increased yields.
- Application of *Trichoderma harzianum* (40g/m2) inoculum was found effective in reducing the disease caused by *S. rolfsii* in sugarbeet.