

Late blight of potato

This is one of the most serious of all diseases of potato. This disease is of wide occurrence. This disease is the main cause of the famous Irish famine in 1845-46.

Symptoms :- The symptoms generally appear on the above ground parts of potato plant but later on the underground parts such as tubers are also infected. It damages potato crops by killing the foliage and so reducing the yield.

The first indication of the disease on leaflets, petiole or on stem consists of brownish to purplish - black lesions. The infected areas subsequently increase in dimensions. During moist weather these areas extend rapidly and there is profuse hyphal and sporangial development. In case of severe infections entire crown of leaves may perish within 2-3 days. After the destruction of the foliage, the infection advances on the underground parts specially on tubers. Tubers may also catch infection at the time of harvesting or during storage. Early infection is also responsible for reducing the size and number of tubers. Primary infection to tubers is caused by zoospore or sporangia. The rot may be either dry or wet depending upon the availability of moisture. Dry rot of tubers is usually expressed by formation of brownish areas which extends to 4 or 5 inch below the surface. In moist weather the

surface of the infected tubers turn light creamy due to formation of sporangia.

Causal organism - The causal organism is Phytophthora infestans. The mycelium is unseptate coenocytic, hyaline and branched. The mycelium are both inter- and intracellular. They form rudimentary haustoria in host leaf cells but in the tubers the haustoria are more common and elaborate club-shaped hooked or spirally twisted.

The sporangiophores arise directly from the internal mycelium, emerging from the leaf through the stomata. The sporangia are colourless, papillate, lemon shaped.

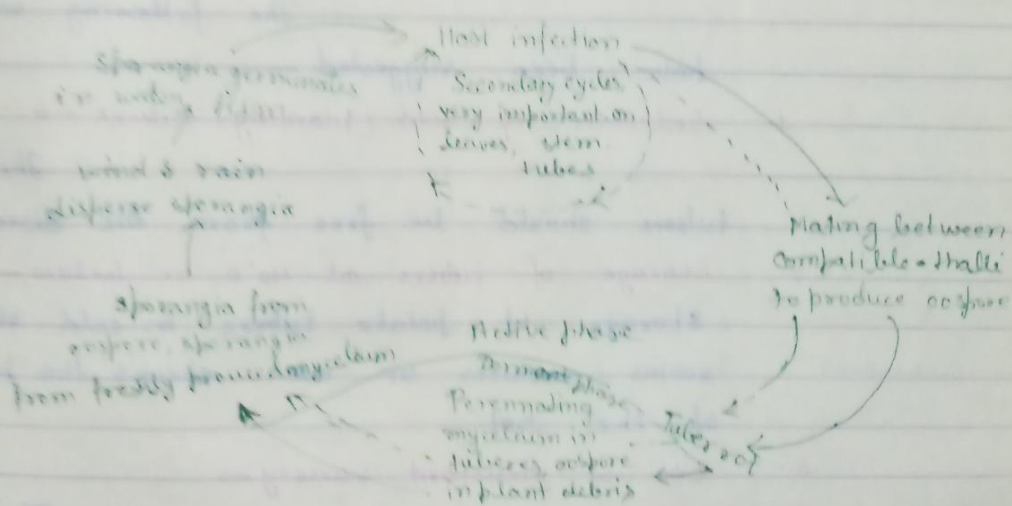
In favourable condition the sporangia germinate by the development of biflagellate secondary zoospores. Otherwise and the sporangia behave like conidia and germinate by germ tube. The zoospore on coming to rest after swimming period, germinates by germ tube which penetrates through stomata or directly through epidermal cells of host tissues.

Sexual reproduction is oogamous. The antheridia develops first. The oozonia are ovoid or spherical, smooth, reddish brown, measuring $31-46\mu$ in diameter. The oospore germinates by producing a germ-tube.

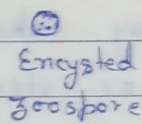
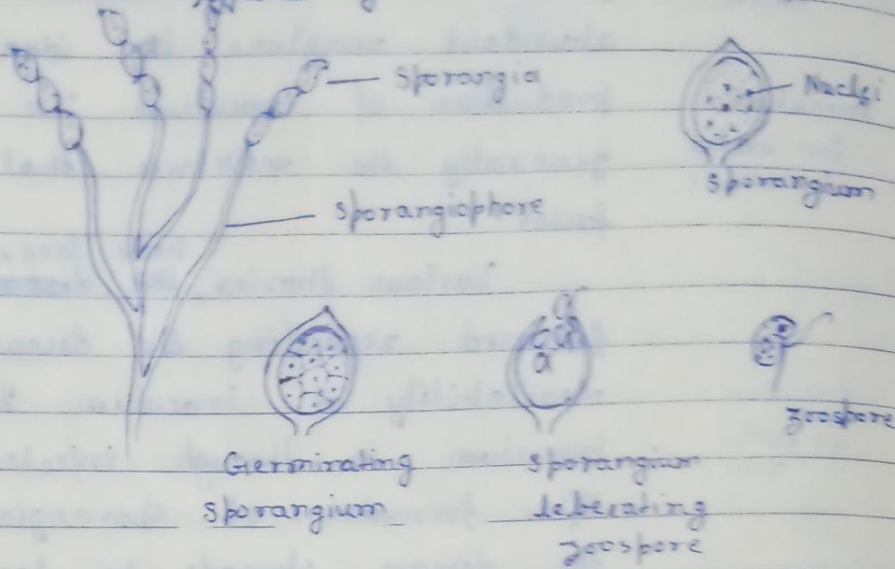
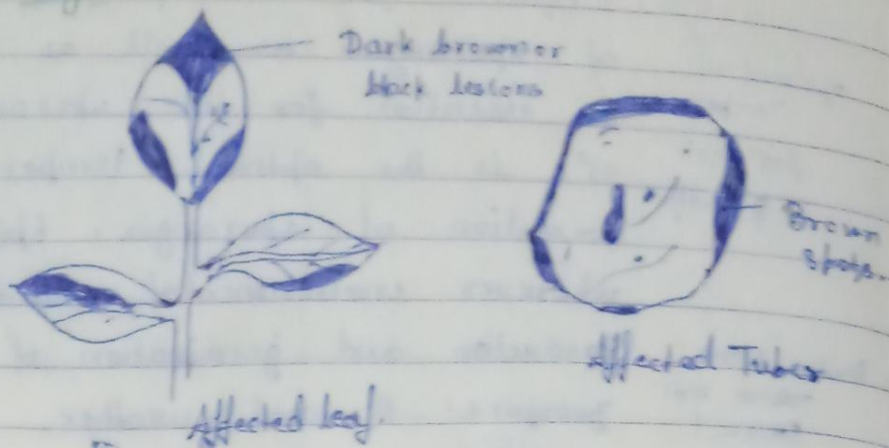
Disease cycle - The disease incidence and its spread, always depends upon weather conditions. The suitable condition is

required for the production and germination of sporangia as well as zoospores. 80% RH is essential for the sporangial germination. 20°C is the optimal temperature for the formation of sporangia. Epiphytias occur whenever environmental conditions favour the production and germination of sporangia and zoospores. A cool weather, combined with abundant moisture is ideal for bulk production of inoculum. In India, it is generally the moisture that becomes limited factor.

Various theories have been put forward regarding the disease cycle and availability of inoculum. The only source of inoculum is through infected see tubers. After formation of sporangia or zoospores, the disease spreads to large number of plants. Infection may take place through any part of leaf or stem. In tubers, infection takes place through eyes, lenticels and wound.



Dig



Germination of encysted zoospore.

Control of diseases

The following measures have been suggested -

Selection of seed (planting) tubers ->

The seed

tubers should be free from the disease.

Storage of tubers at 40°F or below ->

Storage of potato tubers in cold storage rooms reduces or even checks the progress of the rot.

Use of resistant variety ->

Tuber treatment before storage -> The tuber

should be dipped in 1:1000 mercuric

chloride solution for 90 mins before storage. They should be properly washed before use.

Spraying → Bordeaux mixture (4:4:50), Dithane D-14, Dithane D-78, Dithane M-22 etc are the important fungicides.

6. **Dusting** → Some people ^(कतना करना) claim that dusting the foliage with copper-lime dust is more effective control measure. Dusting is done in the morning when plants are wet with dew drops.

7. **Sanitation** → Disposal & destruction of potato tubers refuse from field & storage house is recommended.