



Plant Pathology in the Classroom

Plants get sick too!

ST. ANTHONY'S FIRE

- Caused by alkaloidal poisoning from ergot bodies in small grains, especially rye
- First called Holy Fire because of the burning sensations at the extremities.
- Mass outbreak of ergotism reported in 875 AD when "a great plague of swollen blisters consumed the people by a loathsome rot so that their limbs were loosened and fell off before death" (Annals of Xanthes).
- Outbreaks have occurred less frequently since ergot contaminated bread was found to be the cause of the disease, but outbreaks documented in the 20th century include:
 - 1926 Soviet Union (11,000 victims)
 - 1929 Ireland
 - 1951 France (300 victims)
 - 1978 Ethiopia

Causal organism: Fungal pathogen *Claviceps purpurea*



POTATO WART IN P.E.I.

- Presence of the disease confirmed in the corner of one field Oct 2000.
- Imports of table and storage potatoes from P.E.I. to USA banned.
- Nearly 10,000 soil samples analysed.
- Continuing surveillance of stored potatoes, washing and packaging procedures for at least 3 years.
- Cost to Canadians, potato producers in P.E.I. and industry? Unknown at present but \$\$Millions\$.

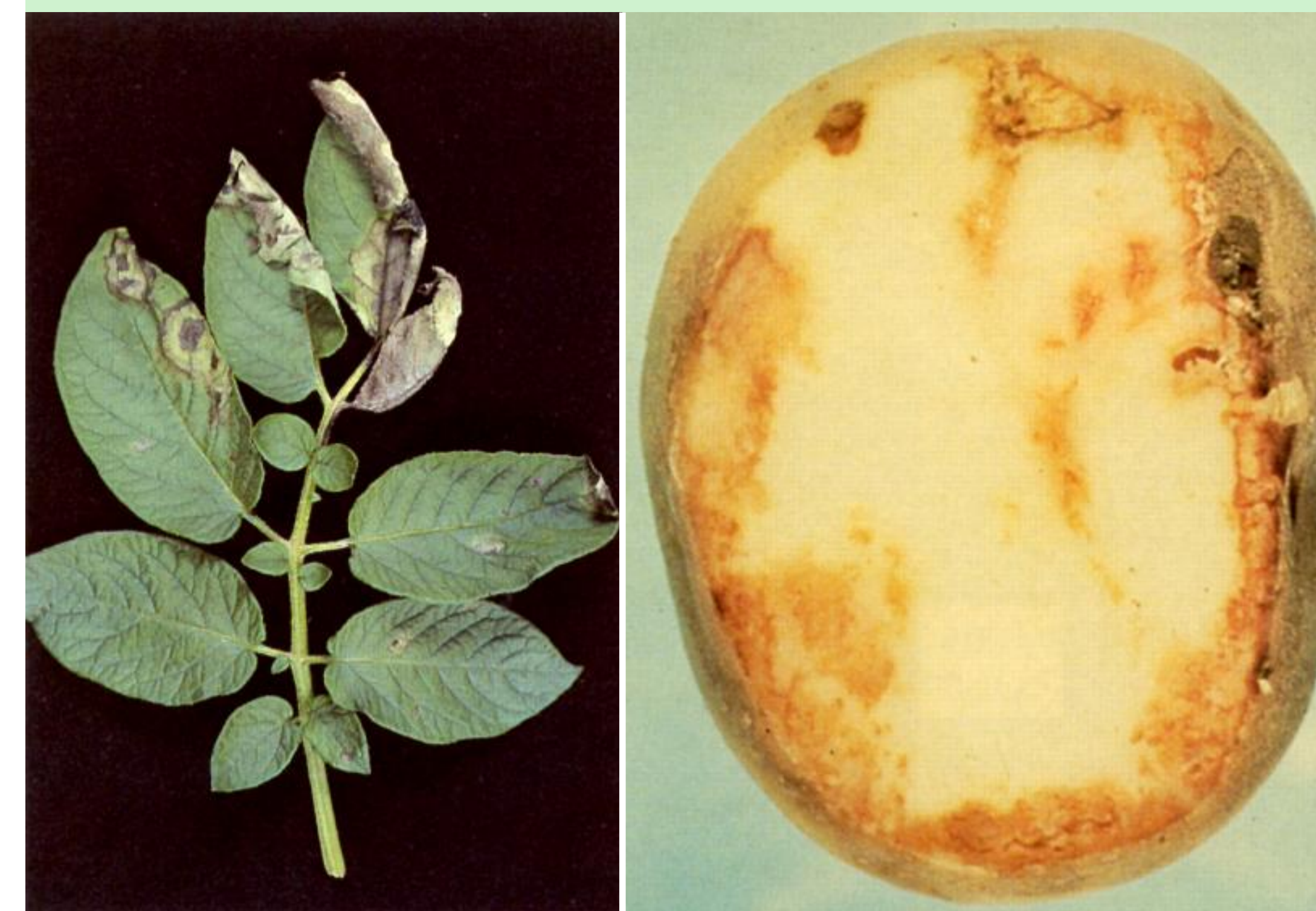
Causal organism: Fungal pathogen *Synchytrium endobioticum*



IRISH POTATO FAMINE

- 1845 Severe epidemics of late blight of potatoes in Great Britain, The Netherlands and Belgium.
- 1846 Infected potato tubers planted - crop destroyed. 80% of the Irish food supply lost.
- More Irish died in the Famine of 1845 to 1849 than in any war before or since.
- More than a million of a population of 8 million people in Ireland died.
- Of the survivors, one and a half million emigrated to North America.
- Huge demographic changes.

Causal organism: Fungal pathogen *Phytophthora infestans*



BLACK STEM RUST

- One of the most destructive and earliest recorded diseases of all time.
- Aristotle (382-322 BC) mentions the devastation of rust and years when rust epidemics occurred in Italy.
- Causes severe lodging of small grain cereals, especially wheat.
- Up to total crop loss.
- 1950 Last major epidemic in North America when race 15B suddenly became prevalent.
- Requires constant monitoring to ensure that new races are identified as early as possible to enable breeding of new wheat varieties with genetic resistance.

Causal organism: Fungal pathogen *Puccinia graminis* f.sp *tritici*



FUSARIUM HEAD BLIGHT

- Recent emergence of a serious disease first reported more than a century ago.
- 1993 Most devastating epidemic recorded in southern Manitoba. Estimated losses to Manitoba farmers of more than \$50 million annually since.
- Infected spikelets become bleached; fungus infects grain causing fusarium damaged kernels (FDK or tombstone kernels)
- Mycotoxin (DON) accumulates in the kernels. Renders grain unfit for human consumption or livestock feed. Pigs especially sensitive to the toxin.
- Continuing epidemics in part due to climate change in the past decade. Higher rainfall in July when wheat is in flower and most susceptible to infection.

Causal organism: Fungal pathogen *Fusarium graminearum*

