



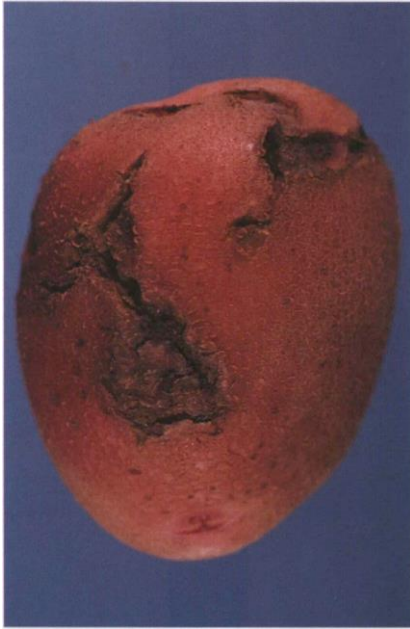
**16.1a** Bacterial ring rot; wilted stem, a characteristic susceptible reaction.



**16.1b** Bacterial ring rot; wilted stems and premature dieback of foliage.



**16.1c** Bacterial ring rot; moderately severe symptoms in tubers.



**16.1d** Bacterial ring rot; skin cracking on tuber.



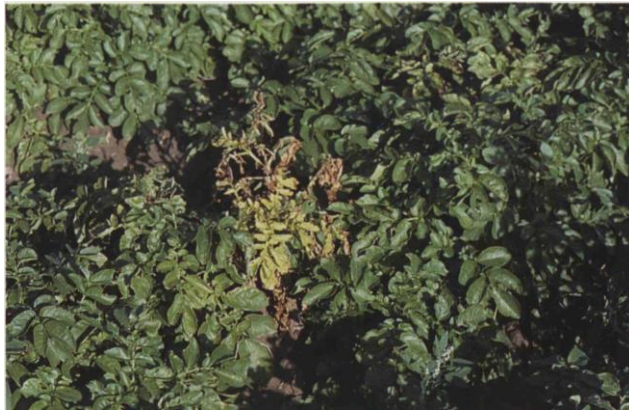
**16.1e** Bacterial ring rot; very severe symptoms in tubers.



**16.2a** Bacterial soft rot; lenticel infections of tuber.



**16.2b** Bacterial soft rot; severe decay of tubers in a plastic bag.



**16.3a** Blackleg; affected plant with wilted, chlorotic foliage.

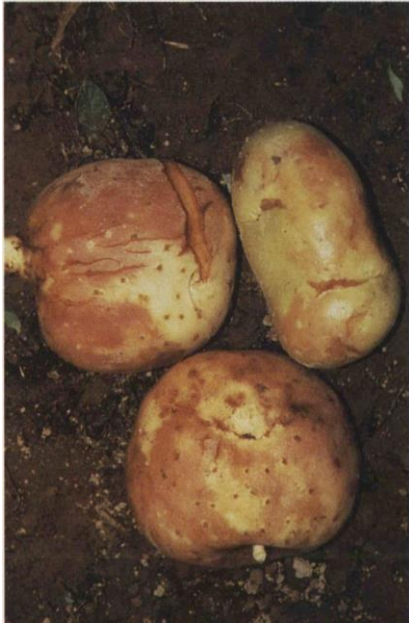


*16.3b* Blackleg; rotted tuber; note infection started at stolon end.



*16.3c* Blackleg; soot-black discoloration of stem and bacterial ooze.





**16.4a** Pink eye; cracked skin with pink- brown discoloration.



**16.4b** Pink eye; severely affected tubers.



**16.5a** Common scab; raised symptom, erupting lesions.



**16.5b** Common scab; deep-pitted symptom, lesions up to 6 mm deep.



**16.5c** Common scab (above); shallow symptom. Russet scab (below); corky reticulations.



**16.6a** Black dot; microsclerotia of *Colletotrichum* on dead vine.



**16.6b** Black dot; an affected tuber with microsclerotia of *Colletotrichum* (tiny black dots).



**16.7a** Dry rot; sunken, shrivelled lesion and concentric rings on affected tuber.



**16.7b** Dry rot; tuber cavity lined with white mycelium of *Fusarium*.



**16.8a** Early blight; leaf lesions are often delimited by veins and have concentric rings. See late blight, 16.11a,b.

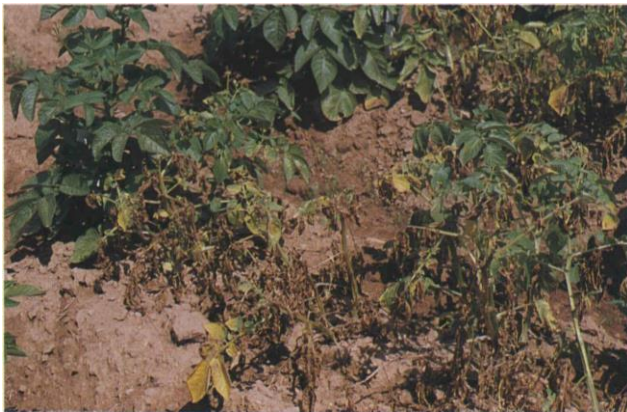




**16.8b** Early blight; severe top-killing in potato field.



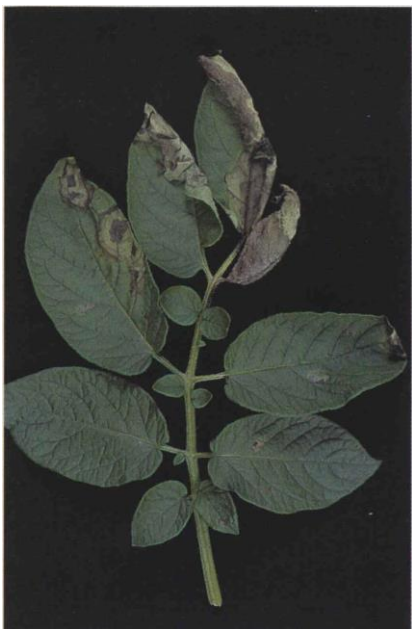
**16.8c** Early blight; sunken area on tuber caused by *Alternaria* infection.



**16.9** Fusarium wilt; severely wilted plants.



**16.10** Gray mold; gray-black lesions turn brown during dry weather.



**16.11a** Late blight; leaf lesions, at first water- soaked, quickly become dark brown, brittle.



**16.11b** Late blight; diffuse leaf lesions; compare with early blight, 16.8a.



**16.11c** Late blight; stem infection.



**16.11d** Late blight; reddish, granular, sunken lesions in tuber.



**16.12a** Leak; internal symptoms in tubers.





**16.12b** Leak; severely rotted tubers.



**16.13** Phoma rot; pocket-like lesions formed in tuber following wounding.



**16.14** Pink rot; tissues surrounding the decay have a pinkish tinge.



**16.15a** Rhizoctonia canker; lesions on newly emerged sprouts on seed piece.



**16.15b** Rhizoctonia canker; characteristic stem cankers.



**16.15c** Rhizoctonia canker; black scurf stage (sclerotia) on tuber.



**16.15d** Rhizoctonia canker; knobby tubers from infected plants.



**16.15e** Rhizoctonia canker; cupped, pinkish upper leaves, often mistaken for purple-top wilt.



**16.15f** Rhizoctonia canker; aerial tubers formed on infected vines.



**16.15g** Rhizoctonia canker; perfect state (*Thanatephorus cucumeris*), gray-white mycelium (center) just above soil line.





**16.16** Powdery scab; numerous deep pits, usually smaller and rounder than in common scab (see 16.5).



**16.17a** Seed-piece decay; very poor emergence in affected crop.



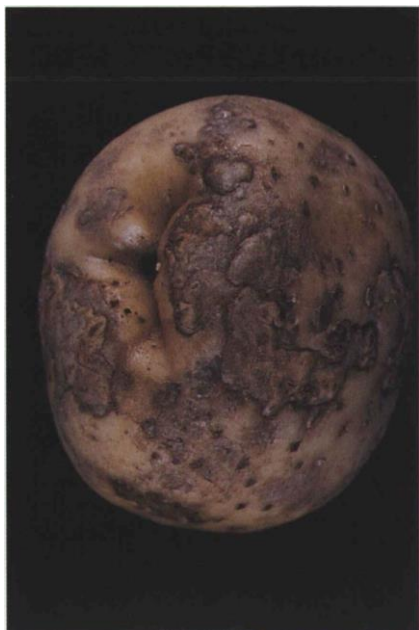
**16.17b** Seed-piece decay; rotting seed piece.



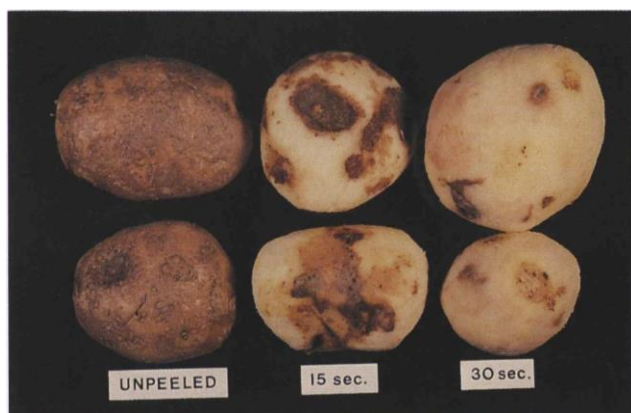
**16.17c** Seed-piece decay; decayed seed piece.



**16.18a** Silver scurf; moderately affected tuber.



**16.18b** Silver scurf; severely affected tuber.



**16.18c** Silver scurf; unpeeled and abrasive-peeled tubers; affected tubers are difficult to peel, skin tissue may remain.



**16.19** Skin spot; small, sunken spots with raised centers on tuber surface.



**16.20a** Verticillium wilt; wilted plants.



**16.20b** Verticillium wilt; note vascular discoloration in cut stem.



**16.20c** Verticillium wilt; vascular discoloration at stem end of infected tuber.





**16.21a** Wart; galls on above-ground stem tissue.



**16.21b** Wart; infection at base of potato stem.



**16.21c** Wart; tuber infection (large gall).



**16.21d** Wart; black-wart stage and stolon tip infection.



**16.22** White mold; potato vine with mycelium of *Sclerotinia sclerotiorum*.



**16.23** Aster yellows; plant showing purple- top wilt (foreground).



**16.24** Calico; leaf yellowing symptoms.

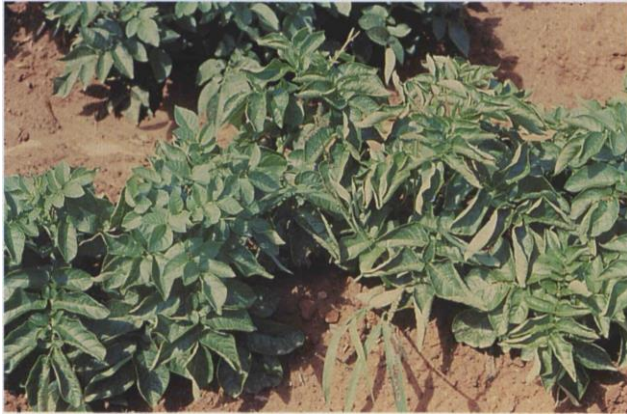


**16.25a** Corky ring spot; external ring spotting symptoms on tubers.

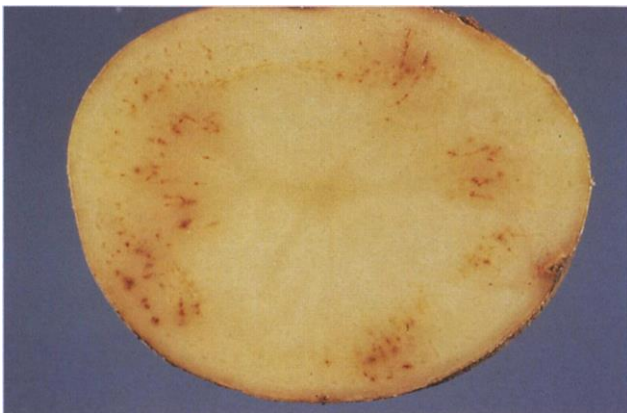


**16.25b** Corky ring spot; brown lines and areas in tubers.





**16.26a** Leafroll; marked upward rolling of leaves on affected plant (center).



**16.26b** Leafroll; net necrosis may form in tubers of some cultivars during storage.



**16.27a** Mosaic; mild mottling and distortion of leaves (potato virus X).



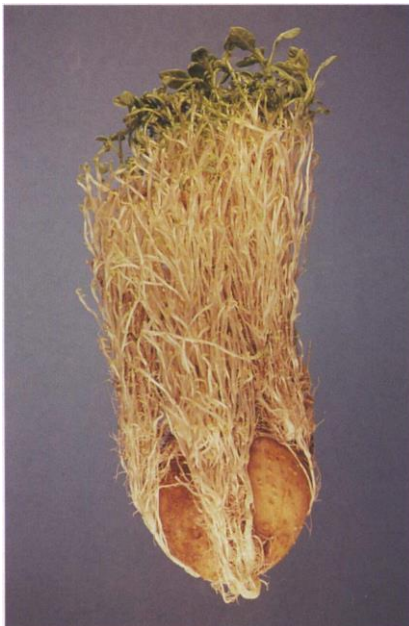
**16.27b** Rugose mosaic; severely wrinkled leaves (potato virus X plus Y).



**16.28a** Spindle tuber; affected plant displaying upright growth habit.



**16.28b** Spindle tuber; spindle-shaped tubers from affected plants.



**16.29a** Witches'-broom; numerous shoots arise from infected tuber.



**16.29b** Witches'-broom; upright, multi- branched stems, small aerial tubers.



**16.30** Blackheart; discoloration usually from lack of oxygen.





**16.31** Growth cracks; note callus in the cracked areas.



**16.32** Hollow heart; large, angular, tan to brown cavities inside affected tuber.



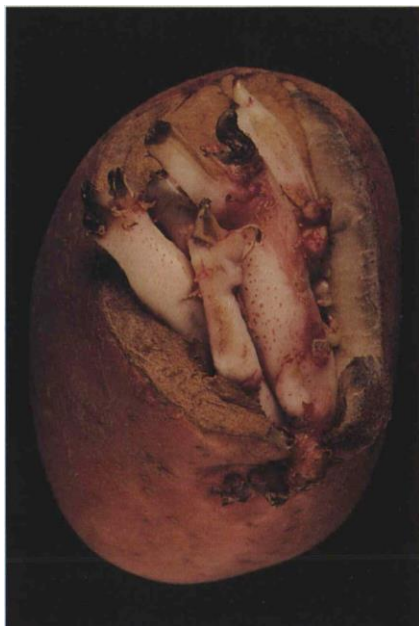
**16.34a** Genetic abnormality; pink color in center of tuber of white- fleshed cultivar.



**16.34b** Herbicide injury; fiddlehead distortion caused by picloram.



**16.34c** Herbicide injury; tuber malformation from amitrole residue in soil.



**16.34d** Internal sprouting; from storage above 16°C or from sprout inhibitor.



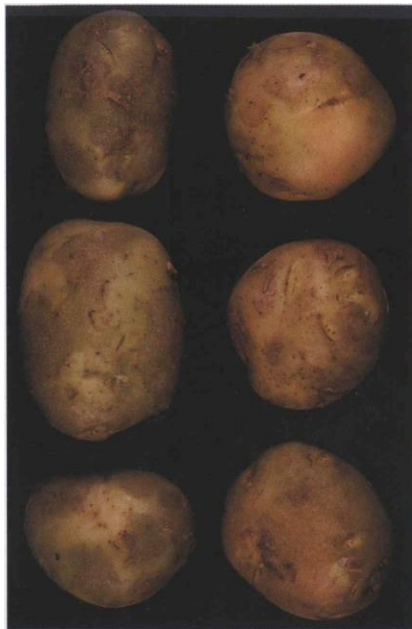
**16.34e** Leaf flecking; induced by highly acidic soil (left), healthy leaf (right).



**16.34f** Manganese deficiency; chlorotic foliar symptoms.



**16.34g** Secondary tubers; new tubers on seed-piece sprouts.



**16.34h** Tuber greening; chlorophyll and toxic alkaloids from exposure to light (left).





**16.34i** Sprouting; stolons from young tubers; induced by high soil temperatures.



**16.34j** Secondary tubers; new tubers on sprouts from mother tubers.



**16.34k** Stem-end browning; brownish streaks at stem end of affected tubers.



**16.34m** Enlarged lenticels; tuber symptoms, caused by wet soil conditions.



**16.34n** Cold injury; results in necrotic areas in tuber flesh.



**16.35** Northern root-knot nematode; penetration of lenticels results in scab-like lesions.



**16.36** Golden nematode; white or golden-yellow cysts on potato roots.



**16.37** Potato-rot nematode; symptoms on tubers inoculated with U.S. isolates; not found in Canada since the 1960s.



**16.38** Root-lesion nematode; yield in plots having 0 (left) to about 18000 nematodes per kg (8100/lb) of soil.



**16.40a** Buckthorn aphid; wingless adult and nymphs.

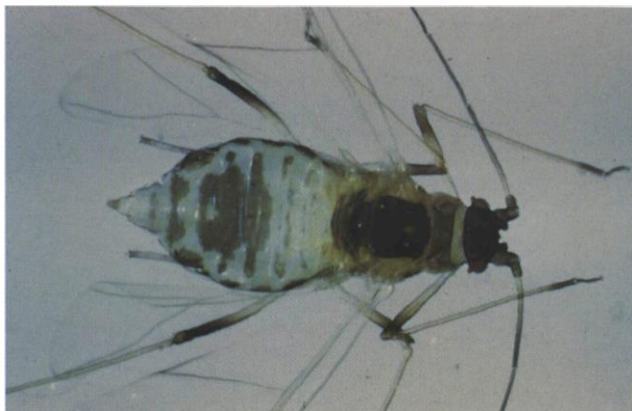


**16.40b** Buckthorn aphid; winged adult; length 1.2-2.0 mm.



**16.41a** Green peach aphid; wingless adults and a nymph.





**16.41b** Green peach aphid; winged adult; length 1.2-2.5 mm.



**16.42a** Potato aphid; aphids on potato leaf; color varies from yellow-green to pink.



**16.42b** Potato aphid; wingless adult; length 1.7-3.6 mm.



**16.42c** Potato aphid; winged adult; largest of the potato-colonizing aphids in Canada.



**16.43** Foxglove aphid; nymph.



**16.44a** Colorado potato beetle; adults mating on foliage; length  $\pm$  10 mm.



**16.44b** Colorado potato beetle; eggs on underside of leaf.



**16.44c** Colorado potato beetle; larvae, and severe defoliation.



**16.44d** Colorado potato beetle; larva showing distinctive markings.



**16.45a** Potato flea beetle; leaflets scarred by adult feeding.



**16.45b** Potato flea beetle; leaf damage from adult feeding, resulting in shot-hole appearance.



**16.45c** Potato flea beetle; adult; length  $\pm 1.7$  mm.





**16.46a** Potato leafhopper; hopperburn symptom, caused by feeding.



**16.46b** Potato leafhopper; adult; length 3-4 mm.



**16.47a** Potato stem borer; female moths laying eggs; wingspan  $\pm$  42 mm.



**16.47b** Potato stem borer; eggs and newly hatched larva.



**16.48a** Tuber flea beetle; tuber damage from larval feeding.



**16.48b** Tuber flea beetle; partially peeled tuber showing damage to flesh.



**16.48c** Tuber flea beetle; adults; length 1.5-2.0 mm.



**16.49a** White grub; damage to potato.

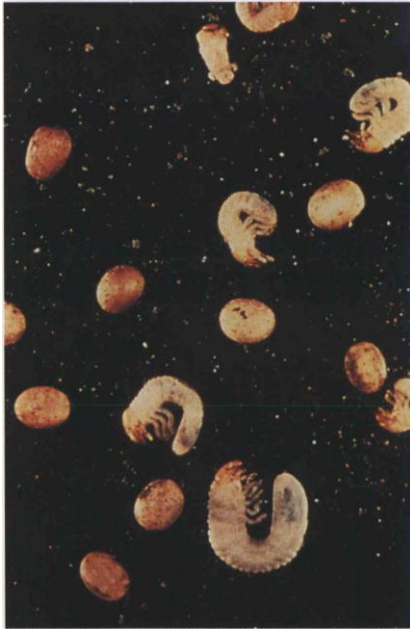


**16.49b** White grub; larva, adult June beetle, and damage from larval feeding.



**16.49c** White grub; adult June beetles; length  $\pm$  20 mm.





**16.49d** White grub; eggs and newly hatched larvae.



**16.49e** White grub; mature larva; length  $\pm 30$  mm.



**16.50** Wireworm; larvae and severe injury to a tuber.