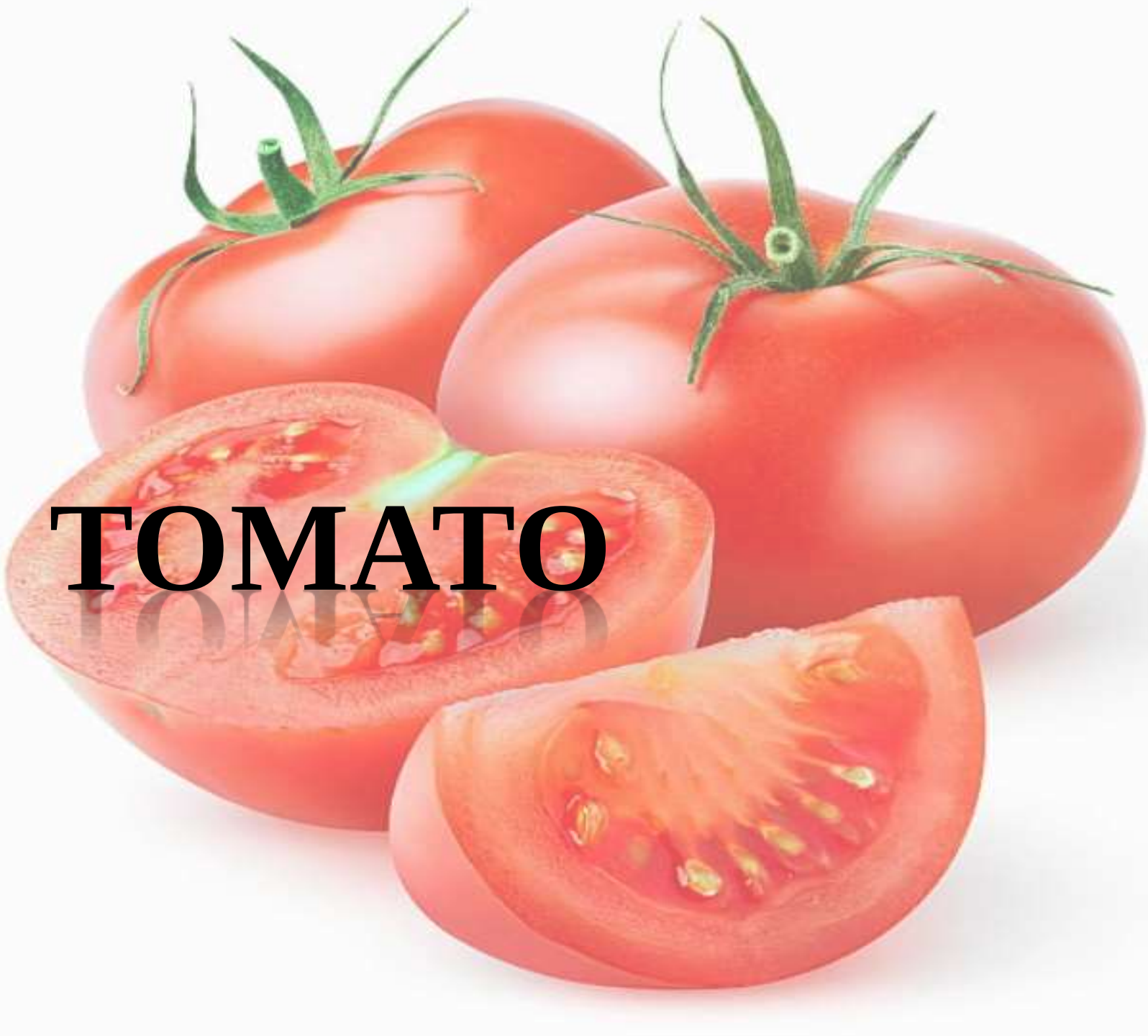
POST HARVEST DISEASES AND DISORDERS OF VEGETABLES

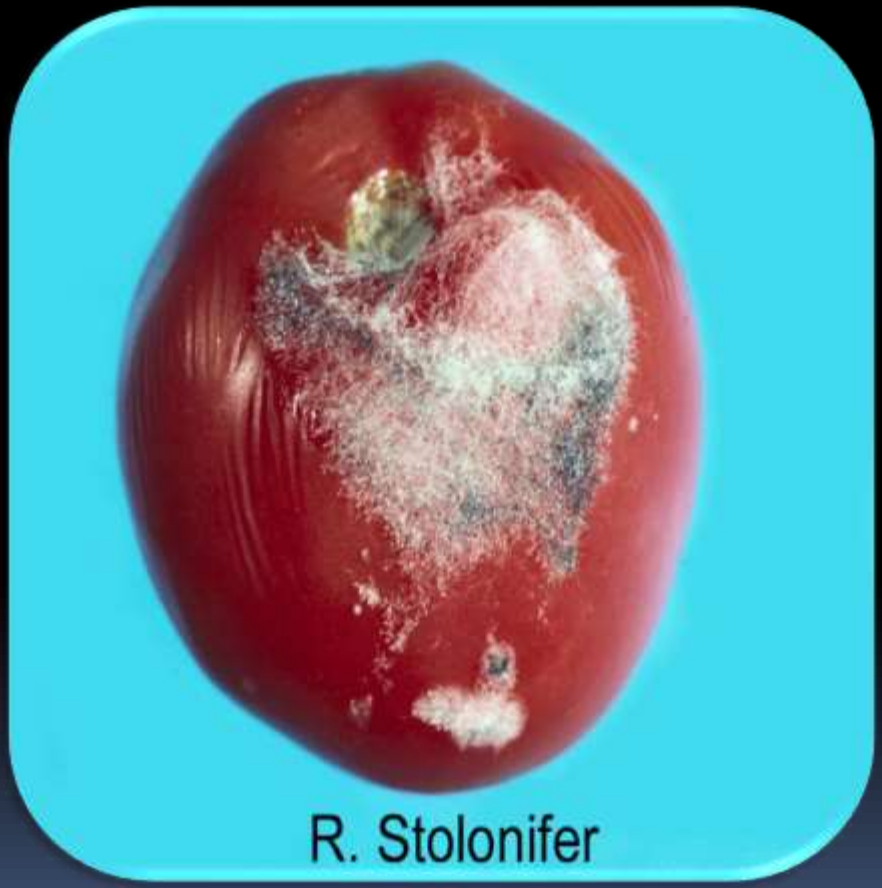

TOMATO

RHIZOPUS ROT- *R. STOLANIFER*

Symptoms

- Water-soaked lesion which exude a clear liquid
- Lesion surface may be covered with thin, cotton-like fungal structures (especially under humid conditions)
- Tissues within the lesion are usually held together by relatively coarse strands of fungal hyphae
- Dark sporulation may crown the white tuft of *Rhizopus*

Rhizopus rot



GRAY MOULD (*BOTRYTIS CINEREA*)

Symptoms

- Watery lesion area with a light brown or tan-colored central region which contain dark-brown specks
- Converted into a soft, watery mass within a few days
- Skin is broken, the grayish mycelium and spore clusters develop within a few hours

Gray mould

Early Blight (*Alternaria solani*)

Symptoms

- Leaves – circular to angular, dark brown to black spots with characteristic concentric rings
- Spots coalesce and cause drying of leaves
- Stem- dark spots at base near the ground and gradually girdled
- Spots- juncture of the side branches- easily broken by wind

Early Blight

Late Blight (*Phytophthora infestans*)

Symptoms

- Leaves, stems and fruits are attacked
- Brown to purple black lesions – leaflet, stem, fruit
- Early russet brown marbled areas appear on the green fruits which becomes completely brown & shriveled

Late Blight

Southern Blight (*Sclerotium rolfsii*)

Symptoms

- Mature plants are attacked just below the soil surface and are completely girdled
- The tops wilt and die rapidly
- Mycelium often grows over the diseased tissue and surrounding soil forming a white mat of mycelial threads with the typical tan-to brown, at the crown mustard-seed-sized sclerotia
- Often the entire root system is destroyed

Southern Blight

Phoma Rot (*Phoma destructiva*)

Symptoms

- Leaves- small, dark, irregular spots – yellow and wither prematurely
- Fruits- circular, depressed water soaked spots
- Become black an leathery on the surface bearing numerous black specks
- specks - pycnidia or fruiting bodies of the fungus

Phoma Rot

BRINJAL

Fruit rot - *Phomopsis vexans*

Symptoms

- First phase - blight on young seedlings
- Stem - girdled slightly above the soil line, plant topples and dies
- Stem lesion - dark brown, becoming grey in the centre as pycnidia develops
- Leaf - irregular brown spots
- Fruits – soft, watery & decays
- Finally black, mummified as pycnidia develop abundantly over the surface

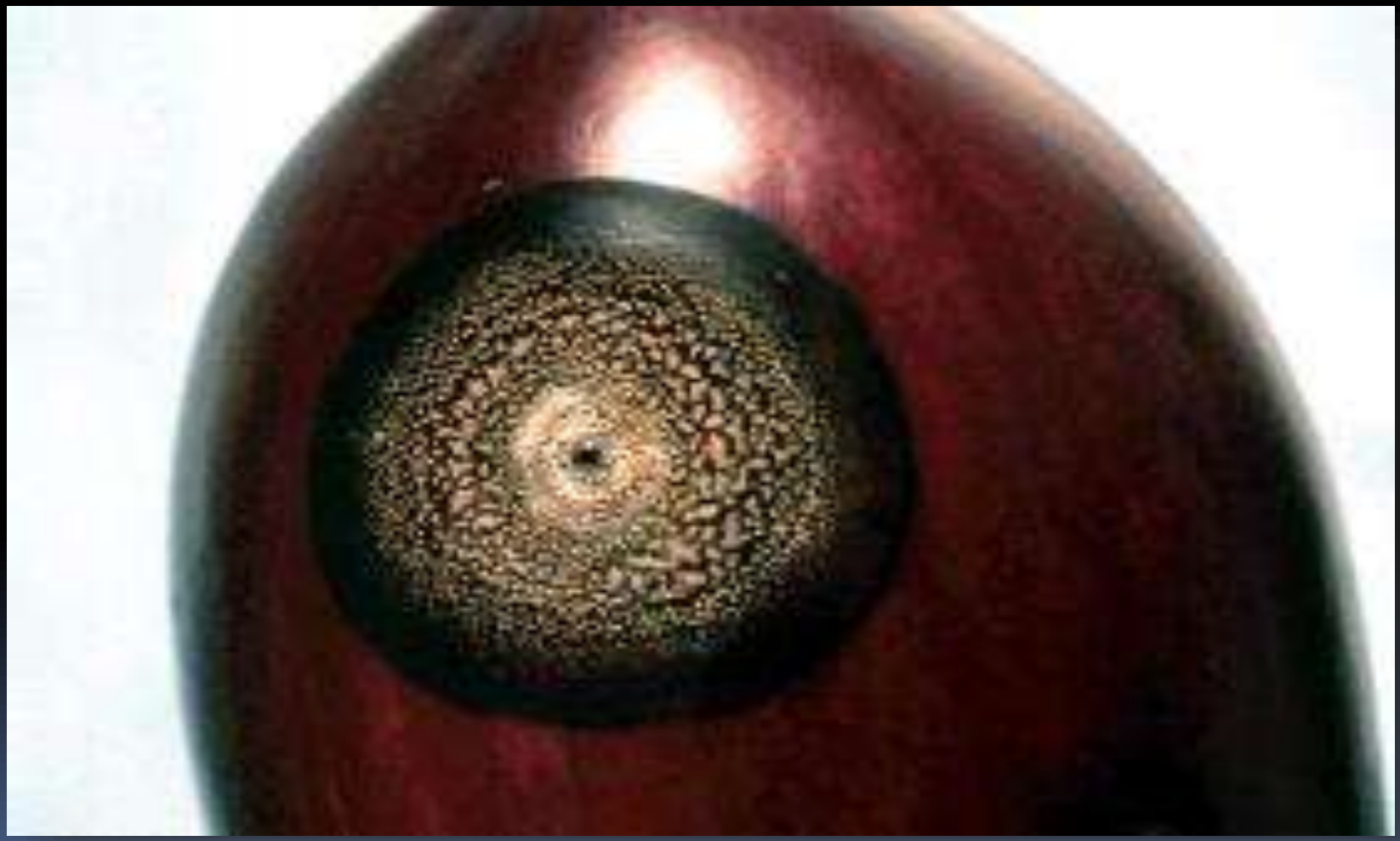
Fruit rot

Anthracnose (*Colletotrichum melongenae*)

Symptoms

- Sunken lesions on fruits vary in size
- Upto 1.3cm wide and may coalesce
- Tan colored ooze of fungal spores appear on lesions
- Fruit dries & become black – fruit drop

Anthracnose



BHENDI

Rhizoctonia rot (*Rhizoctonia solani*)

Symptoms

- Pod - greenish color turning brown, and the infected tissues fully covered with mycelia
- Internally, immature seeds and placenta were infected and the diseased tissues were light brown to black
- Externally, mycelia tend to be fluffy and lighter in color, forming a large number of dark sclerotia on the fruit surface

Rhizoctonia rot

CHILLI AND CAPSICUM

Bacterial Soft Rot- *Erwinia carotovora*

Symptoms

- Initially, the lesions on the fruit are light to dark-colored, water-soaked, and somewhat sunken
- In later stages, bacterial ooze may develop from affected areas, and secondary organisms follow, often invading the rotted tissue
- Affected fruit hang from the plant like a water-filled bag

Bacterial Soft Rot

Anthracnose-(*Colletotrichum capsici*)

Symptom

- Ripe fruits turning red are affected
- Small, black, circular spot appears on the fruit skin
- Badly diseased fruits turn straw colour or pale white colour, lose their pungency

Anthracnose

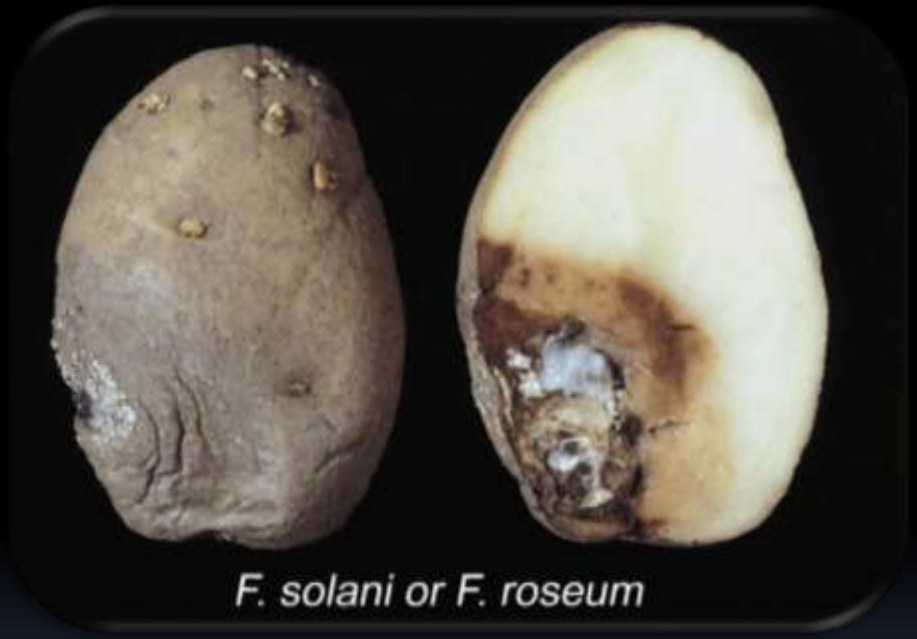
POTATO

Dry rot (*F. solani* var. *coeruleum*)

Symptom

- Dry dark spots appear on the skin which later becomes sunken and wrinkled with irregular concentric rings
- Spots shrinks and bursts out
- Internal tissue becomes brown and shrunken with cavities filled with numerous white tufts of mycelium
- Rotting progress into whole tuber which loses much of water and become dry hard, shriveled and light in weight

Dry rot



Brown rot (*Ralstonia solanacearum*)

Symtoms

- Bangle blight or bangili
- Leaf- turns bronze colour, shrivel and die
- Vascular system of stem, root, stolon and tuber turns brown
- Ring disease - brown ring in the tuber due to discolouration of vascular bundles
- Whitish bacterial exudate oozes from the vascular system of cut stems and cut tubers

Brown rot

Scab (*Streptomyces scabies*)

Symptom

- Shallow scab – corky tissue which arises from abnormal proliferation of the cells of the periderm of the tuber
- Lesions vary in size and shape and darker than the healthy skin
- Corky lesions 1 to 3mm deep and darker than shallow lesions
- Actinomycete attacks young tubers at a early stage of development

Scab

Silver scurf (*Spondyocladium atrovirens)*

Symptoms

- Lesions - brown, slightly depressed and circular with fimbriate margins
- Dotted with minute black specks or sclerotia of the pathogen
- Organism invades only the cork cells which are destroyed and slough off forming a ‘scurf

Silver scurf

Figure 1. Primary silver scurf lesion on russet skin potato showing the silvery sheen on the skin.

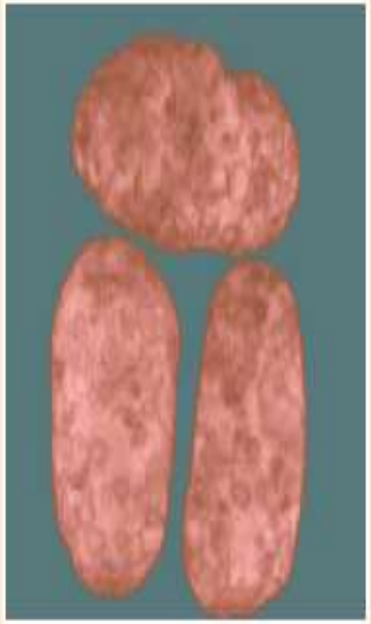


Figure 2. Secondary infection of silver scurf showing the circular black active lesions.

CARROT

Crown rot(*Rhizoctonia solani*)

Symptoms

- Damping-off of carrot seedlings and a crown rot later and during storage
- Field symptoms include premature senescence and death of foliage
- On carrot roots - dark brown sunken lesions or cankers near the crown or in other parts of the root – cavity spot

Crown rot

Black rot(*Alternaria radicina*)

Symptoms

- Seedling infection results in pre emergence and post emergence damping-off
- Older senescing petioles on mature plants are particularly susceptible to infection
- Provide an avenue for infection of the carrot crown, which appears as a black ring of decay where the petioles attach to the root (black crown)
- Stored carrots - dry, black, sunken lesions which can decay the entire root and spread to adjacent carrots

Black rot

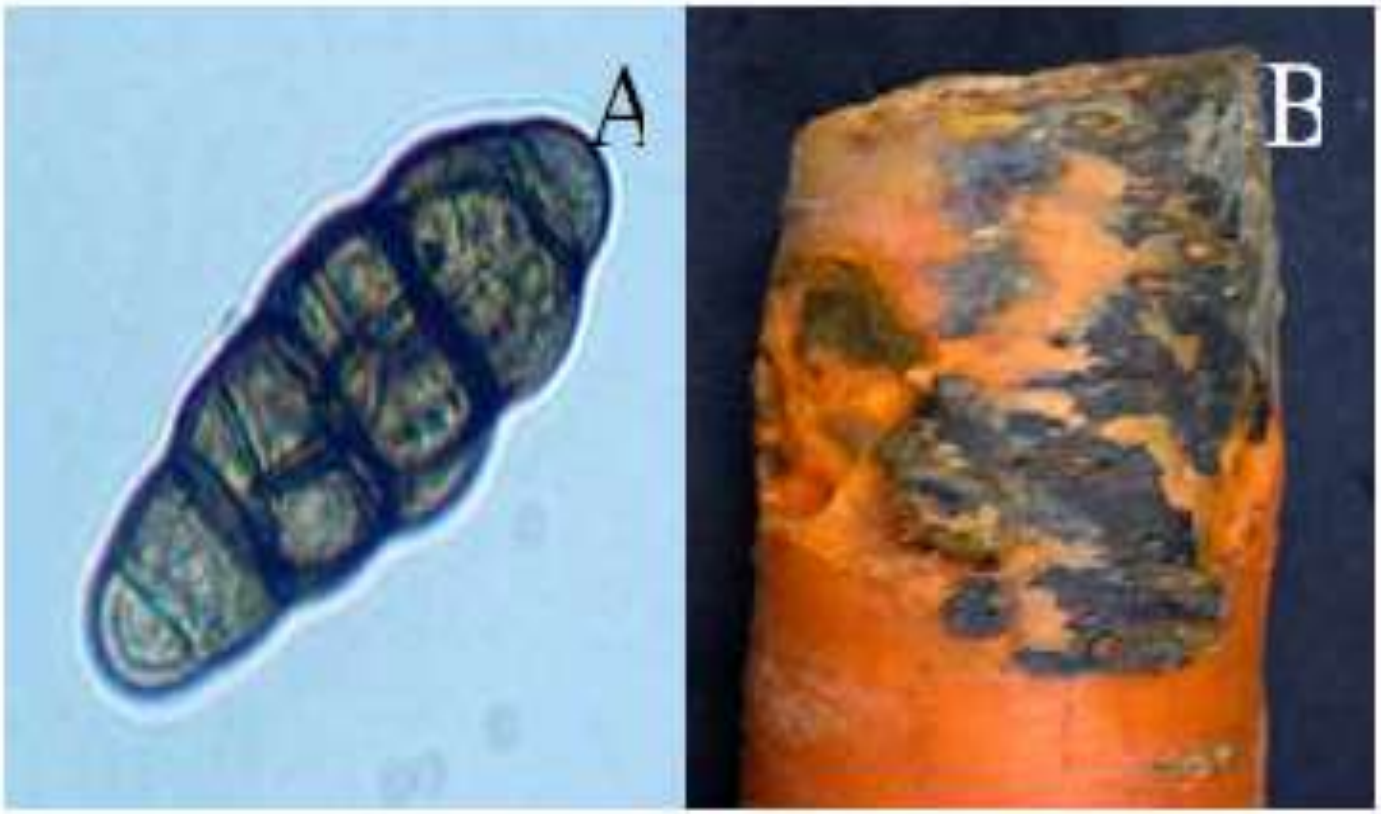


Fig. 1. Spores of *A. radicina* (A), black rot (B).

Bacterial soft rot(*Erwinia carotovora*)

Symtoms

- Cells become water soaked, middle lamella is destroyed and the cells collapse
- Soft, watery or slimy consistency
- Rotted tissues – grey to brown, accompanied by foul odour
- In the field, tops of rotted carrots turn yellow and wilt as roots break down

Bacterial soft rot

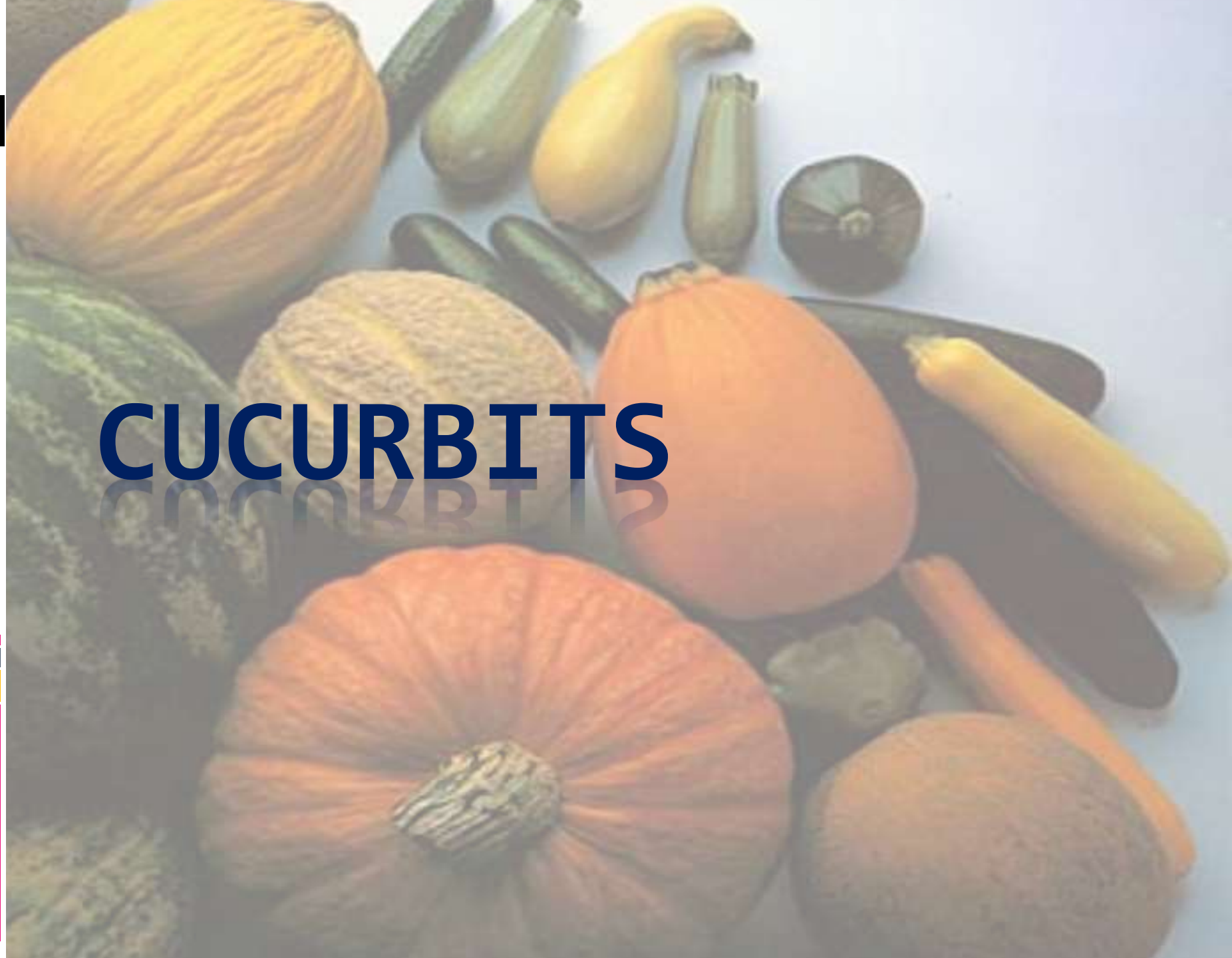
Sour rot - *Geotrichum candidum*

Symptom

- Soft, watery, colorless decay on carrot roots
- Decayed area - covered with dull, white spores of the pathogen and a vinegar-like odour may develop
- Fungus - soil inhabitant that infects carrots through wounds
- In storage – warm temp (greater than 32°F) and improperly ventilated

Sour rot

Fig. 4. *G. candicum* on stored carrots, external (A) and internal (B) symptoms.



CUCURBITS

Choanephora wet rot
Choanephora cucurbitarum

Symptom

- Attacks the blossoms first and progresses into the developing fruit causing a wet rot at the blossom end
- Fruit rot progresses rapidly and can affect entire fruit within one or two days
- Sporulation by the fungus appears as spines with dark heads on the surface of infected tissues

Choanephora wet rot

Fruit rot
Pythium aphanidermatum

Symptoms

- Fruits in intimate contact with soil is affected
- Forms a luxuriant wooly mycelial mat on the affected fruits
- Skin of the friut shows soft, dark green, water soaked lesions
- Interior tissue become watery and soft and decaying matter emits a bad odour

Fruit rot

Belly rot (*Rhizoctonia solani*)

Symptoms

- Dark brown water-soaked decay on the side of the fruit in contact with the soil
- Followed by a yellowish-brown discolouration of the fruit surface
- Entire fruit rot within few days

Belly rot

ONION

Neck Rot (*Botrytis allii*)

Symptom

- Latent disease - although infection takes place in the field
- Softening of scales which take on a water soaked appearance
- Under moist conditions - greyish sporulating mycelial mat develops on the surface of the scales

Neck rot

Blue Mould Rot(*Penicillium spp*)

Symptoms

- Initial symptoms - water soaked areas on the outer surface of scales
- Later, a green to blue green, powdery mould may develop on the surface of the lesions
- Infected areas of fleshy scales are tan or grey when cut
- In advanced stages, infected bulbs may disintegrate into a watery rot

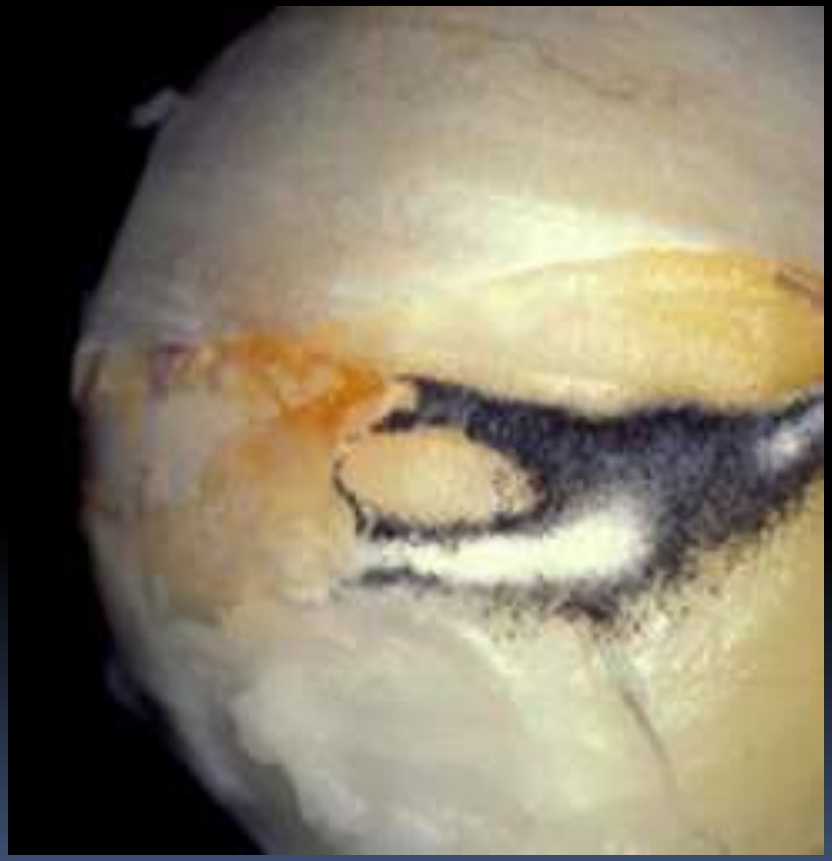
Blue Mould Rot

Black mould:(*Aspergillus niger*)

Symptoms

- Masses of black powdery spores on both exterior and between the scales of the bulbs
- Especially along the vascular strands of the veinswed by these scales becoming dry and papery

Black mould



GARLIC

Basal rot:(*Fusarium oxysporum*)

Symptom:

- Reduced bulb size, bulb decay, and brown, poorly developed root systems
- In storage - bulbs show spongy, sunken, yellow brown rotting lesions
- In early stages - infected bulbs are softened, brown and watery when cut open
- Deep cracks form in the cloves, followed by break down of the tissue, which will eventually dry down to a portion of its original size, the cloves becoming crinkled and small

Basal rot

Pink rot(*Pyrenochaeta terrestis*)

Symptom

- Roots are affected and they turn pink or reddish and sometimes darken to a red or purple colour
- Black spores form on the diseased roots which eventually shrivel and die

Pink rot

Neck rot (*Botrytis allii*)

Symptom

- Found upon the bulbs at the time of harvest
- Affected scale tissue become soft
- Dense layer of grey mould appear at the neck
- Infection progresses most rapidly down the scales which have been originally infected

Neck rot

CAULIFLOWER

Riceyness

- In this disorder velvety or granular appearance on the surface of the curd is seen.
- Due to higher or lower temperature than the optimum temperature required for a particular variety, temperature fluctuation at the time of curd development, poor seed stock generally causes ricyness.
- Selection of proper variety and transplanting at right time controls this malady.

Riceyness

Fuzziness

- The flower pedicels becomes velvety and curd elongates.
- The cultivation of the cultivars out of their normal growing season encourages this disorder.
- Sowing of good quality of seed in right times under proper cultural practices minimizes the fuzziness.

fuzziness

CABBAGE

Pepper spot

Symptoms

- Black spot has tiny sunken black spots that form around the stomata of the inner and outer leaves.
- The small spots give the impression of sprinkled pepper, which is why this disorder is also known as pepper spot.

Pepper spot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Thank you.