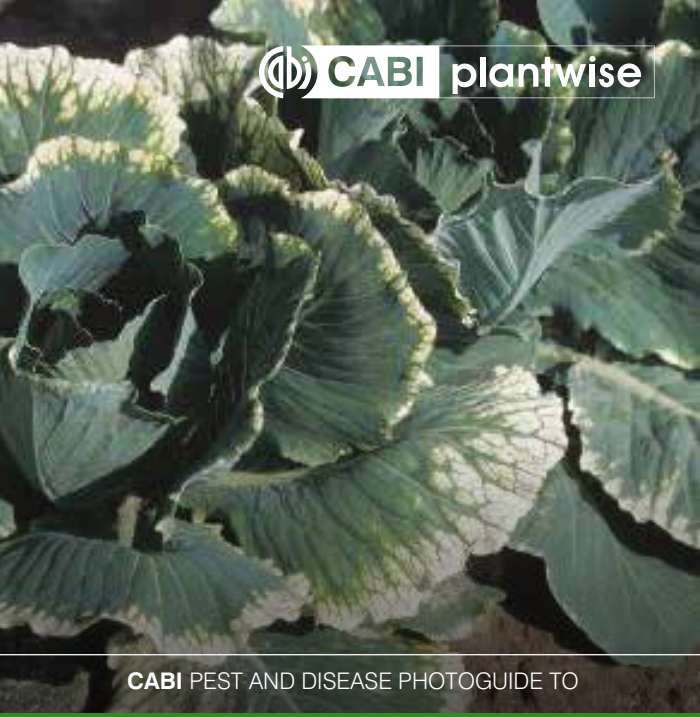

CABI plantwise

CABI PEST AND DISEASE PHOTOGUIDE TO

Cabbage disorders

KNOWLEDGE FOR LIFE

Introduction

This photo booklet has been produced by the CABI-led **Plantwise** programme (www.plantwise.org) to aid extension officers and other plant health advisors in diagnosing the most common pests, diseases and abiotic problems of coffee around the world. The symptoms presented on a real plant sample can be compared with the photos in this guide to identify possible causes.

The booklet is organized into two broad sections, one showing the common insect pests that attack the crop and the other showing the various symptoms of poor health. In the symptoms section, the images are arranged by plant part, with similar-looking symptoms displayed together. Some biotic and abiotic factors cause more than one type of symptom, so there may be multiple images in different parts of the photo booklet for a specific problem. The photos for a particular problem are cross-referenced to make it easy to find all the relevant photos.

Contents

Turnip moth

Agrotis segetum

Photo: F. L. Martin GNU licence

- The larvae are generally grey sometimes looking a little purple.
- Attacks the lower stems often results in cutting off of seedlings.
- Often found curled up near the base of plants.

BACK TO CONTENTS

Cabbage leaf sawfly

Athalia proxima

Photo: Merle Shepard, Gerald R.Carner, and P.A.C Ooi, Insects and their Natural Enemies Associated with Vegetables and Soybean in Southeast Asia, Bugwood.org

- Milk white eggs 0.6-0.9 mm high.
- The lava is NOT a true caterpillar (there are more than 4 false feet on the body of the larvae).
- Early instars are grey/dark grey, as they age the head turns black.
- Tough silken yellow cocoon.

BACK TO CONTENTS

Cabbage looper

Trichoplusia ni

Photo: Distant Hill Gardens, Flickr

- Initially larvae are greyish/white, later pale green and marked with distinct white stripe on each side.
- Larvae have three pairs of prolegs; crawl by arching back to form a loop and then projecting the body forward.
- Eggs yellowish, white or greenish, 0.6 mm diameter and 0.4 mm tall, laid singly or in small clusters.

BACK TO CONTENTS

Black cutworm

Diaphorina citri

Photo: B Smith, Flickr

- Larvae are often same colour on back and underneath, ranging from light grey/grey-brown to nearly black; underside may be lighter.
- Initially feed on leaves but older caterpillars will cut the plant off at ground level.
- Mainly a pest of young plants as older plants are more resistant.

BACK TO CONTENTS

Cabbage webworm

Hellula rogatalis

Photo: A. N. Sparks Jr. University of Georgia, Bugwood.org

- Older larvae have 5 dark stripes from head to tail and yellowish or brownish hairs.
- Larvae produce a lot of silk, for protection.
- Eggs laid singly or in small masses on the youngest leaves, oval and flattened in shape, greeny grey.

BACK TO CONTENTS

Egyptian cottonworm

Spodoptera littoralis

Photo: Biologische Bundesanstalt für Land- und Forstwirtschaft, Biologische Bundesanstalt für Land- und Forstwirtschaft, Bugwood.org; O. Heikinheimo, Bugwood.org

- Hairless larvae, 40-45 mm long, dark and light bands running down sides with black patches at both ends.
- Eggs eggs laid in regular rows, 0.6 mm in diameter. White initially but black before hatching, often in mass of hair scales (see insert).

BACK TO CONTENTS

Cotton leafworm, Tobacco cutworm

Spodoptera litura

Photo: Yuan-Min Shen, Taichung District Agricultural Research and Extension Station, Bugwood.org

- Young larvae pale green to dark green, older larvae are brown.
- Yellow stripes along the back and the sides, with a row of black dots along each side and a row of dark triangles each side of the central line.

BACK TO CONTENTS

Diamondback moth

Plutella xylostella

Photo: A. N. Sparks Jr. University of Georgia, Bugwood.org

- Full-grown larvae are 10mm long; body green but can be yellowish with distinct body segments, and bears a few short hairs.
- Head pale to pale greenish or pale brown, mottled with brownish and black-brown spots; eye spot is black.

BACK TO CONTENTS

Cabbage cluster caterpillar

Crocidolomia pavonana

Photos: Merle Shepard, Gerald R.Carner, and PA.C Ooi, Insects and their Natural Enemies Associated with Vegetables and Soybean in Southeast Asia, Bugwood.org

- The later larval stages have whitish stripes, 3 on the back and one on each side.
- Eggs are laid in masses of up to 300 at a time and held together with a glue (see insert right), greenish in colour, becoming red-brown later.
- Pupae are yellowish green when formed but turn dark brown later.

BACK TO CONTENTS

Large cabbage white butterfly

Pieris brassicae

Photos: P. Taylor, CABI

- Larvae up to 30 mm long; yellow and black with obvious hairs.
- Often initially on the underside of leaves or hidden among young leaves.
- They produce large amounts of black frass (excrement).

BACK TO CONTENTS

Small cabbage white butterfly

Pieris rapae

Photo: S. Nelson, Flickr

- Larvae up to 25 mm long; green or bluish-green with thin yellow line on back.
- Body covered with short fine hair.

BACK TO CONTENTS

Cabbage root fly

Delia radicum

Photos: Rasbak, Wikimedia.org

- Larvae (up to 6 mm) white and pointed at one end; burrow into roots (main picture).
- Flies look like small house flies, 6 mm long (insert left).
- The fly lays white, elongated eggs at the base of plant.
- Pupae are brown and are also found in the soil (insert right).

BACK TO CONTENTS

Egyptian cottonworm

Spodoptera littoralis

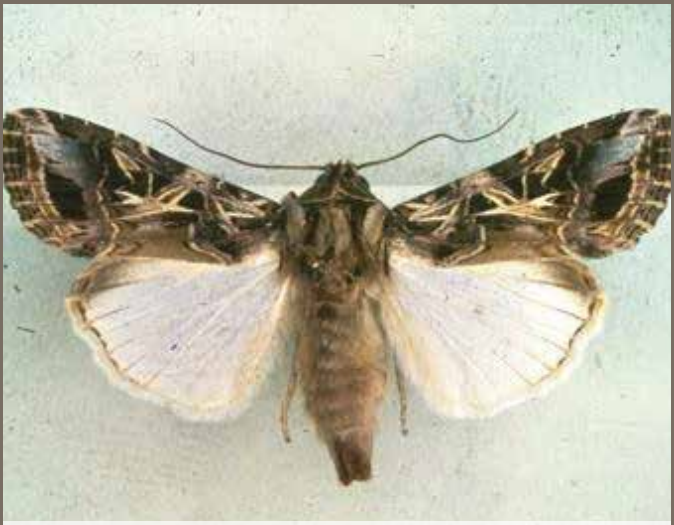

Photo: O. Heikinheimo, Bugwood.org

- Grey brown body, wingspan 30-38 mm.
- Forewings grey to reddish brown.
- Rear wings greyish white with grey edges.

BACK TO CONTENTS

Cabbage webworm

Hellula rogatalis

Photo: Natasha Wright, Cook's Pest Control, Bugwood.org

- Yellowish brown front wings with bands and a dark kidney shaped spot; greyish rear wings.
- Body 20 mm long, wingspan 13 mm.
- Resting on the ground where it is well camouflaged the moth takes short random flights when disturbed.

BACK TO CONTENTS

Cotton leafworm, Tobacco cutworm

Spodoptera litura

Photo: D. Hobern, Flickr

- Adult moths 15-20 mm, with wingspan of 30-38 mm.
- Forewings grey to reddish-brown, with a complex pattern of creamy streaks and paler lines along the veins. Rear wings are greyish-white with greyish-brown margins.

BACK TO CONTENTS

Diamondback moth

Plutella xylostella

Photo: IITA, Flickr

- Adult small, slim, greyish-brown moth with pronounced feelers (antennae).
- Marked with a broad cream or light brown band along the back.
- When viewed from the side, the tips of the wings can be seen to turn upward slightly.

BACK TO CONTENTS

Cabbage cluster caterpillar

Crocidolomia pavonana

Photo: Goldentakin, Flickr

- Wingspan about 30 mm; black thorax and a reddish brown body.
- They emerge at night.
- Larvae initially feed on the underside of the leaves but then eat the whole leaves and finally the stem.

BACK TO CONTENTS

Large cabbage white butterfly

Pieris brassicae

Photo: Hania Berdys, Bugwood.org

- Wingspan 55-70 mm, with upper sides usually very white, with a pronounced black tip to the forewing.
- The head, and body are black with grey hair-like scales.

BACK TO CONTENTS

Turnip moth

Agrotis segetum

Photo: T. Morris, Flickr

- Shows various colour forms, although usually the forewings show a neat, pale fringe with a narrow inner dark line and the rear wings are white.
- Wingspan is 32–42 mm.
- Flies at night.

BACK TO CONTENTS

Small cabbage white butterfly

Pieris rapae

Photo: Forrest and Kim Starr, Starr Environmental, Bugwood.org

- Wingspan 32–47 mm; upper side is creamy white with black tips on the forewings. Females also have two black spots in the centre of the forewings. Underwings are yellowish with black speckles.
- Looks like a smaller version of the Large cabbage white butterfly (*Pieris brassicae*).

BACK TO CONTENTS

Black cutworm

Agrotis ipsilon

Photo: Whitney Cranshaw, Colorado State University, Bugwood.org

- Forewings have small, black dagger-like markings extending towards wing tip and a whitish band extending across the wing; wingspan 40-55 mm.
- Eggs about 0.5 mm in diameter, ball shaped, with a slightly flattened base; laid in clusters on leaves.

BACK TO CONTENTS

Cabbage looper

Trichoplusia ni

Photo: Joseph Berger, Bugwood.org

- Forewings are mottled grey-brown in colour with silvery white spots centrally, with a U-shaped mark and a circle or dot that are often connected (which is characteristic of this pest).
- Rear wings light brown at the base with ends dark brown. Wingspan 33-38 mm.

BACK TO CONTENTS

Large cabbage white butterfly

Pieris brassicae

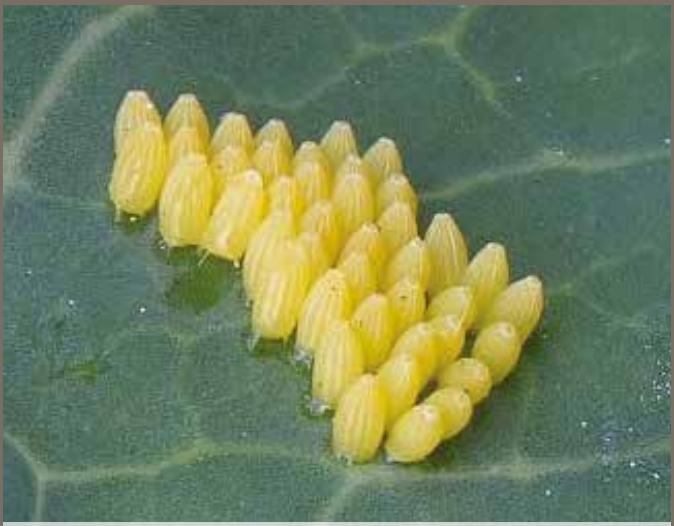

Photo: Rasbak Wikimedia.org

- Eggs bright yellow, bottle-shaped, 1.4 mm high, ribbed vertically and laid upright in clusters of 40-100.

BACK TO CONTENTS

Small cabbage white butterfly

Pieris rapae

Photos: Phil Sloderbeck, Kansas State University, Bugwood.org Merle Shepard, Gerald R.Carner, and P.A.C Ooi, Insects and their Natural Enemies Associated with Vegetables and Soybean in Southeast Asia, Bugwood.org

- Yellowish to cream coloured, bullet shaped, deeply ridged eggs laid on the leaves of host plants.
- Often laid singly or in few numbers on the leaves of both wild and cultivated brassicas.

BACK TO CONTENTS

Swede midge

Contarinia nasturtii

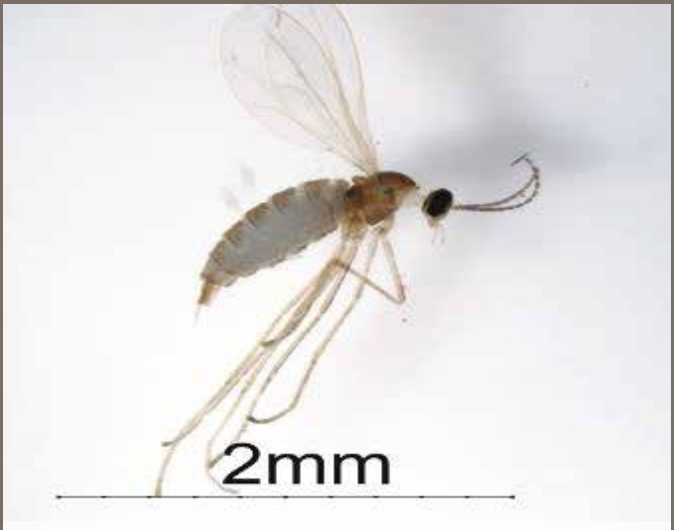

Photo: Susan Ellis, USDA APHIS PPQ, Bugwood.org

- A tiny, light brown fly that looks a bit like a mosquito.
- Several generations a year, which means adults can be seen in any month.
- The pupa is found in the soil.

BACK TO CONTENTS

Cabbage leaf sawfly

Athalia rosae

Photo: D. Hobern, Flickr

- Orange middle section with black markings; abdomen yellow/orange with black ovipositor.
- Clear membranous wings with obvious veination.

BACK TO CONTENTS

Vegetable leaf miner

Liriomyza sativae

Photo: Central Science Lab, Bugwood.org

- Tiny yellow and black fly.
- Middle section is shiny black.
- Not active fliers and will only take short jerky flights from one leaf to the next; often seen walking around on leaf surfaces.

BACK TO CONTENTS

Cabbage whitefly

Aleyrodes proletella

Photo: Rasbak, Wikimedia.org

- Adults 1.5 mm long; white wings with four grey spots – wings white due to a powdery wax. Head dark with yellow underside; red eyes.
- Often seen on leaf underside, flying only when disturbed.
- Nymphs are yellow and scale-like.
- Can transmit viruses.

BACK TO CONTENTS

Harlequin bug

Murgantia histrionica

Photos: Whitney Cranshaw, Colorado State University, Bugwood.org

- Black, shield-shaped stinkbug, brilliantly marked with red, yellow and orange.
- Young (nymphs) appear similar to adults.
- Feeding damage is yellow or white slivery areas on leaves and heavy infestations can cause plants to wilt, turn brown and die.
- Eggs are barrel-shaped and laid together.

BACK TO CONTENTS

Mealy cabbage aphid

Brevicoryne brassicae

Photo: E. Finkle, Flickr

- Very closely packed colonies of grey waxy aphids, each aphid about 2.5 mm long; mostly without wings.
- Often found on undersides of leaves.
- Leaves can become distorted and reddened, even when infestations are small.
- Can transmit viruses.

BACK TO CONTENTS

Onion thrips

Thrips tabaci

Photos: Whitney Cranshaw, Colorado State University, Bugwood.org;
A. N. Sparks Jr University of Georgia, Bugwood.org

- Young (nymphs) and adults very small 0.5-1.2 mm. The body is thin, and slender. Their eyes are darker and are easy to see.
- Often like to crawl into regions between leaves.

BACK TO CONTENTS

Green peach aphid (Peach potato aphid)

Myzus persicae

Photo: C. Quintin, Flickr

- Can be many colours from yellow green or pink but any one aphid is the same colour all over.
- Winged forms are usually black.
- Usually found on lower sides of leaves in sparse colonies.
- Transmits a lot of viruses.

BACK TO CONTENTS

Mustard aphid

Lipaphis erysimi

Photo: A. N. Sparks Jr University of Georgia, Bugwood.org

- Olive-green to brown, with ridges on the back.
- Found on leaf underside, young shoots, growing points, and when severe on both sides of the leaf.
- Causes leaf rolling, yellowing and stunting.
- Severe infestations prevent head formation and flowering.

BACK TO CONTENTS

Crucifer flea beetle

Phyllotreta cruciferae

Photo: Whitney Cranshaw, Colorado State University, Bugwood.org

- Small, oval-shaped, blackish beetle.
- Adults will jump into the air like a flea if you get close to them.
- Larvae and adults attack seedlings. They produce holes in the seedlings leaves and can distort them.
- Do not damage older plants.

BACK TO CONTENTS

Black spot Grey leaf spot Target spot

Alternaria spp. commonly *Alternaria brassicicola*

Photo: Gerald Holmes, California Polytechnic State University at San Luis Obispo, Bugwood.org

- Seen in the seedbed as leaf spots and damping off.
- Small dark brown/black leaf spots, which enlarge and have a target ring pattern.
- Dusty black (spores) material may be seen on fingers after touching the spots.

BACK TO CONTENTS

Black spot Grey leaf spot Target spot

Alternaria spp.

Photo: Gerald Holmes, California Polytechnic State University at San Luis Obispo, Bugwood.org

- Centres of the leafspots split and drop out.

BACK TO CONTENTS

Black Rot

Xanthomonas campestris

Photos: J. Mulema, CABI

- Very common disease.
- Characteristic V-shaped lesions spread in from the edge of older leaves or from insect damage.
- The spreading edge of the lesion is yellow whereas the older areas are brown.

BACK TO CONTENTS

Calcium deficiency

Calcium deficiency

Photo: David B. Langston, University of Georgia, Bugwood.org

- Edges of leaves turn brown.
- Can be hidden inside the cabbage head on enclosed leaves and so not visible at harvest.
- Necrosis does not spread to neighbouring leaves in the same way a pathogen does.

BACK TO CONTENTS

Leaf miner

Liriomyza spp.

Photo: P. Taylor, CABI

- Long winding tracks within the leaf.
- Hold up the leaf up to the light to see the larva and frass (excrement) within the leaf mine.

BACK TO CONTENTS

Onion thrips

Thrips tabaci

Photo: Gerald Holmes, California Polytechnic State University at San Luis Obispo, Bugwood.org

- Silvering of leaves which may become brown and hard (corky) as the plant responds to the damage (by this time the thrips may have moved on).
- Thrips are often associated with oily droplets of frass (excrement) deposited on the leaf surface (seen with a handlens).

BACK TO CONTENTS

Downy Mildew

Hyaloperonospora brassicae

Photo: Gerald Holmes, California Polytechnic State University at San Luis Obispo, Bugwood.org

- Usually a leaf disease but can attack seedling leaves, stems of seedlings and the white region of cauliflower.
- Can be vein limited in some cases.
- In cool weather there may be little yellowing (initially) but with time or in hot dry weather the plant material will become yellow and then brown.

BACK TO CONTENTS

Ring spot

Mycosphaerella brassicicola

Photo: M. Gammelgaard, platesygdomme.dk

- Well defined spots 10-20 mm, usually tan coloured and covered in black dots (fruiting bodies).
- The border of the spots is grey/olive colour and this may remain after the rest of the leaf has yellowed.

BACK TO CONTENTS

Soft rot of cabbage / Bacterial black Stalk

Pectobacterium carotovorum ssp. *carotovorum*

Photos: P Taylor, CABI; Gerald Holmes, California Polytechnic State University at San Luis Obispo, Bugwood.org

- Lower end of the mid-rib rots and loses structure.
- A characteristic extremely unpleasant smell.
- Spreads along leaf veins.
- Bacterial ooze can be seen leaking from the rotting area.

BACK TO CONTENTS

White leaf spot

Mycosphaerella brassicicola / Pseudocercosporella capsellae

Photos: David B. Langston, University of Georgia, Bugwood.org

- Appears as tan or light brown spots, they may join together and may drop out.
- Can appear similar to Paraquat damage.
- Stem lesions are elongated and brown at first, turning ashy grey to white with a brownish margin.

BACK TO CONTENTS

Powdery Mildew

Erysiphe cruciferarum

Photo: J. Mulema, CABI

- White powdery growth that spreads over the upper surface of leaves.
- Initially the leaf will appear healthy beneath but will become brown with time.
- Characteristic mushroom-like smell.

BACK TO CONTENTS

White rust

Albugo candida

Photo: P. Taylor, CABI

- Various amounts of browning can occur; green islands can remain after the leaf has yellowed.
- Often associated with blistering and distortion of the leaves or shoot.
- Can be seen on all parts of the plant.

BACK TO CONTENTS

Edema

Photo: David B. Langston, University of Georgia, Bugwood.org

- Swellings, usually on the underside of leaves; some cultivars more susceptible than others.
- Non-pathogenic disorder that will not spread from one plant to another.
- It is caused by a combination of high humidity and high soil moisture content, might also be the result of some chemical sprays.

BACK TO CONTENTS

Ennations

Photo: P. Taylor, CABI

- Small leaflets appear on the main leaf laminar.
- Unusual symptom for which the cause is not known.

BACK TO CONTENTS

Downy Mildew

Hyaloperonospora brassicae

Photo: Gerald Holmes, California Polytechnic State University at San Luis Obispo, Bugwood.org

- Downy growth usually on the underside of leaves but can be on both sides if severe.
- This may be sparse (as shown above) or very downy and like fluff.

BACK TO CONTENTS

Whiptail of crucifers

Molybdenum deficiency

Photo: P. Taylor, CABI

- Leaves develop a boat-like appearance if the plant is short of molybdenum.
- If very severe the leaf edges are so reduced that the mid rib is all that remains, with the leaf appearing as though it's been eaten.

BACK TO CONTENTS

Root rot damping off

Rhizoctonia spp. and others

Photo: Gerald Holmes, California Polytechnic State University at San Luis Obispo, Bugwood.org

- May prevent emergence of the seedling.
- If they emerge the base of the young stem is partially or totally destroyed by brown or black rot.
- They generally will fall over due to the rot and die.

BACK TO CONTENTS

White mould

Sclerotina sclerotiorum

Photo: Gerald Holmes, California Polytechnic State University at San Luis Obispo, Bugwood.org

- Usually starts where leaves are in contact with the ground and spreads up the plant leaf by leaf.
- The head (sometimes the roots) eventually invaded.
- Many hard black fungal balls (sclerotia) can be found among the rotting leaves along with the fluffy white mycelium.
- Can develop in store.

BACK TO CONTENTS

Cabbage root fly

Delia radicum

Photos: Clemson University – USDA Cooperative Extension Slide Series, Bugwood.org
Mary Ann Hansen, Virginia Polytechnic Institute and State University, Bugwood.org

- Stunted plants that wilt easily.
- Root system very poorly developed and plants easily lifted from the soil.

BACK TO CONTENTS

Swede gall midge

Contarinia nasturtii

Photo: Julie Kikkert, Cornell Cooperative Extension, Bugwood.org

- Swollen leaf stalks and the deformed leaves.

BACK TO CONTENTS

Boron deficiency

Photo: Gerald Holmes, California Polytechnic State University at San Luis Obispo, Bugwood.org

- Symptoms are generally seen in the young leaves first. They don't expand properly and snap easily.
- Stems are hollowed out.
- Occurs most frequently on coarse or sandy acid soils. Boron becomes less available during drought.
- Easily confused with Calcium deficiency.

BACK TO CONTENTS

Bacterial black stalk

Pectobacterium carotovorum ssp. *carotovorum*

Photo: David B. Langston, University of Georgia, Bugwood.org

- Vascular browning; wilting, darkening and water soaked stems and leaves.
- Total plant collapse.
- Very similar to a severe infection by Xanthomonas in the stem.

BACK TO CONTENTS

Heart rot

Calcium deficiency

Photo: S. Nelson, Flickr

- "Decay" only seen in the central stem and does not spread to leaf stalks.
- Can be mild with a small cavity and browning or can be severe and appear similar to bacterial infection.
- No bad smell is associated with heart rot.

BACK TO CONTENTS

Phytophthora root and stem rot

Phytophthora drechsler

Photo: Paul Bachi, University of Kentucky Research and Education Center, Bugwood.org

- Internal rotting of the stem often with few external symptoms.
- Unlike many other common Phytophthoras this attacks the roots and the middle of the stem.

BACK TO CONTENTS

Black rot of cabbage

Xanthomonas campestris

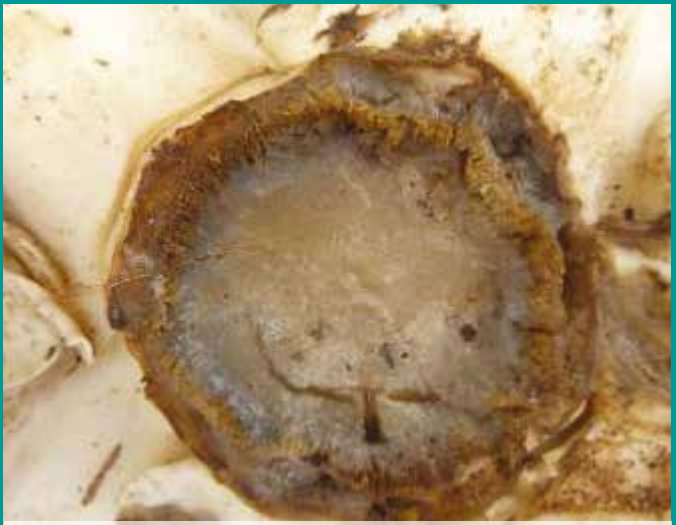

Photo: P. Taylor, CABI

- Rotting of the stem on this scale will only really occurs after a lot of damage to the upper leaves.

BACK TO CONTENTS

Club root

Plasmodiophora brassicae

Photo: Gerald Holmes, California Polytechnic State University at San Luis Obispo, Bugwood.org

- Plants wilt readily.
- Often very stunted and never put on much growth depending on how badly the plants are affected.

BACK TO CONTENTS

Fusarium wilt

Fusarium oxysporum f.sp. conglutinans

Photo: Ontario MoA, Food and rural affairs

- Yellowing of the lower leaves, often initially on one side of the plant they will later turn brown and drop off.
- Brown discolouration inside the stem is characteristic.
- Eventually the entire plant may yellow, wilt, and collapse.

BACK TO CONTENTS

Turnip mosaic virus

TuMV

Photo: Horticultural Research International

- Symptoms vary with host and environment.
- Mosaic and or browning is common. Tips of leaves bending out and down is common.
- Necrotic spotting (black necrotic spots and ringspots) may develop in field or in store.
- Aphid transmitted but with limited direct plant to plant spread.

BACK TO CONTENTS

Cabbage leaf curl virus

CaLCuV

Photo: David B. Langston, University of Georgia, Bugwood.org

- Symptoms on leaves are yellow spots, vein clearing, mosaic, curling, and wrinkling.
- Transmitted by whitefly.

BACK TO CONTENTS

Cauliflower mosaic virus

Ca MV

Photos: Horticultural Research International

- Vein clearing and mild leaf distortion.
- Transmitted by aphids.
- If the weather is warm the symptoms are not seen.

BACK TO CONTENTS

Sugar beet cyst nematode

Heterodera schachtii

Photo:DAFF Archive, Bugwood.org

- General stunting of the plant.

BACK TO CONTENTS

Herbicide damage

Clomazone

Photo: Gerald Holmes, California Polytechnic State University at San Luis Obispo, Bugwood.org

- It is not possible to include all the symptoms that herbicides can induce; bleaching and leaf distortion are often typical.
- Each herbicide chemical may produce characteristic symptoms but a conversation with the farmer may be the quickest means of diagnosis.

BACK TO CONTENTS

Herbicide damage

Imazapic

Photo: David B. Langston, University of Georgia, Bugwood.org

- It is not possible to include all the symptoms that herbicides can induce; stunting and purple leaves can occur (as above).
- Each herbicide chemical may produce characteristic symptoms but a conversation with the farmer may be the quickest means of diagnosis.

BACK TO CONTENTS

Bird damage
(Pigeons)

Photo: P. Taylor, CABI

- May appear similar to locust or caterpillar damage.
- Leaves are torn rather than nibbled.
- No frass is seen.

BACK TO CONTENTS

Sugar beet cyst nematode

Heterodera schachtii

Photo: Gerald Holmes, California Polytechnic State University at San Luis Obispo, Bugwood.org

- Tiny yellow cysts seen on the roots, considerably smaller than nematode galls and unlike the galls the cysts are all the same size.

BACK TO CONTENTS

Club root

Plasmodiophora brassicae

Photo: Gerald Holmes, California Polytechnic State University at San Luis Obispo, Bugwood.org

- Above ground the plants are stunted and wilt readily, often have a blue tinge.
- Below ground large bulbous swellings on the roots are extremely characteristic.
- Initially these are white but they darken with age and may start to decay.

BACK TO CONTENTS

Contact us

Africa

Ghana
CABI, CSIR Campus, No. 6 Agostino Neto Road
Airport Residential Area, P. O. Box CT 8630, Cantonments
Accra, Ghana

T: +233 (0)302 797 202
E: westafrica@cabi.org

Kenya
CABI, Canary Bird, 673 Limuru Road, Muthaiga,
PO Box 633-00621, Nairobi, Kenya

T: +254 (0)20 2271000/20
E: africa@cabi.org

Zambia
CABI, 5834 Mwange Close, Kalundu,
P.O. Box 37589, Lusaka, Zambia

T: +26 (0) 967619665
E: southernafrica@cabi.org

Contact us

Americas

Brazil

CABI, UNESP-Fazenda Experimental
Lageado, FEPAF (Escritorio da CABI)
Rua Dr. Jose Barbosa de Barros 1780
Fazenda Experimental Lageado
CEP:18.610-307
Botucatu, San Paulo, Brazil

T: +5514 38117670
E: y.colmenarez@cabi.org

Trinidad & Tobago

CABI, Gordon Street, Curepe
Trinidad and Tobago

T: +1 868 6457628
E: caribbeanLA@cabi.org

USA

CABI, 745 Atlantic Avenue
8th Floor, Boston,
MA 02111, USA

T: +1 (617) 682-9015
E: cabi-nao@cabi.org

Contact us

Asia

China
CABI, Beijing Representative Office, Internal Post Box 56
Chinese Academy of Agricultural Sciences
12 Zhongguancun Nandajie, Beijing 100081, China

T: +86 (0)10 82105692
E: china@cabi.org

India
CABI, 2nd Floor, CG Block, NASC Complex, DP Shastri Marg
Opp. Todapur Village, PUSA, New Delhi – 110012, India

T: +91 (0)11 25841906
E: cabi-india@cabi.org

Malaysia
CABI, PO Box 210, 43400 UPM Serdang, Selangor, Malaysia

T: +60 (0)3 89432921
E: cabisea@cabi.org

Pakistan
CABI, Opposite 1-A, Data Gunj Baksh Road
Satellite Town, PO Box 8, Rawalpindi, Pakistan

T: +92 (0)51 929 2064/2063
E: sasia@cabi.org

Contact us

Europe

Switzerland
CABI, Rue des Grillons 1
CH-2800 Delémont,
Switzerland

T: +41 (0)32 4214870
E: europe-CH@cabi.org

UK
CABI, Nosworthy Way
Wallingford, Oxfordshire
OX10 8DE, UK

T: +44 (0)1491 832111
E: corporate@cabi.org

UK
CABI, Bakeham Lane
Egham, Surrey
TW20 9TY, UK

T: +44 (0)1491 829080
E: microbiologicalservices@cabi.org
E: cabieurope-uk@cabi.org