



Insect pests of Major Vegetable Crops – part 2 (Vegetable Brassicas, Okra, Cucurbits, Onion & Amaranth)

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MAJOR INSECT PESTS OF CRUCIFERS

- 1. Diamondback moth
 - Plutella xylostella
- 2. Cabbage head caterpillar
 - Crocidolomiaa pavonana
- 3. Striped flea beetle
 - Phyllotreta striolata
- 4. Imported cabbageworm
 - * Pieris rapae
- 5. Cabbage looper
 - Trichoplusia ni
- 6. Aphids

Myzus persicae, Lipaphis erysimi, Brevicoryne brassicae





Diamondback moth, Plutella xylostella

Distribution: Cosmopolitan







Symptoms of damage

 Feeding damage between the leaf tissues on the undersides of the leaf
 Later leaves appear with windows or holes
 Damage is confined to areas between the veins
 On young plants, the growing tips are eaten
 Seedlings appear stunted









Oviposition on leaves, singly or in groups of two or three, 160 eggs
Larva feeds on growing point
10 - 30 days
Pupation in silken cocoon on leaves, 5-15 days
Adult 16 days

Eggs are oval, yellowish-white and tiny glued to the upper and lower leaf surfaces usually along the veins or in uneven leaf surfaces Pale yellowish-green to green caterpillars At maturity the larvae are spindle-shaped (broader at the middle and tapering at both ends)





Pupation (cocoon)



The forewing margins have a series of yellow wavy markings. When the wings are folded while the moth is at rest, these markings come together to form three yellow diamonds - hence the name diamondback





Cabbage webworm, Hellula undalis

Distribution:

- Asia Pacific
- N & W Africa
- America, only US and Peru







Symptoms of damage

- Damage to growing point
- Mostly 1 larva/plant
- Total destruction or multiple unmarketable heads
- Damage important only in young plants













- Oviposition on leaves, stems, growing point
- ✤ 175 eggs, 2-3d
- Larva feeds on growing point, 14 -18d
- Pupation in soil near host-plant, 3-7d
 Adult 6 d











Cabbage head caterpillar Crocidolomia pavonana

Distribution

- Asia Pacific
- Africa- few countries







Symptoms of damage

Foliage feederSkeletonize plant









- Egg masses of 9-120 eggs
- Laid on stems, lower leaf surface major veins
- 75-300 eggs
- Incubation 3-6 day









Larvae

Gregarious feeder
On leaf surface
5 instars
14 days











Pupae









Adults

weak flyerrarely found









Striped flea beetle Phyllotreta striolata

- Distribution: practically worldwide
- Overwhelmingly crucifer feeder





Symptoms of damage

- Shot holes on leaves & cotyledons
 Can destroy plant completely
- Only adults do damage







Oviposition

- eggs in masses
- near base of stem on soil
- incubation 1 week







Larvae

- in soil
- feed on debris
- not host specific







Pupae

- in soil
- larvae-pupae (4w)







Adult

- feeds on crucifer
- longevity 33-100 days
- two generations/season









Imported cabbageworm *Pieris rapae*

Distribution:

- worldwide
- only cooler areas





Symptoms of damage

- irregular holes
- start from leaf edge
- skeletonization









Eggs: Large, deep yellow bullet shape laid singly on foliage incubation 4-8 days







Larvae:

Large, dark green surface feeder velvety appearance, yellow line

- 2-3 w







Pupae:

- ***** cocoons on plant surface
- underside of outer leaves
- ✤ 7-12 d






Adults:

- White butterfly
- Active on sunny days
- Forewing difference
 - one dot male
 - two dots females







Cabbage Looper Trichoplusia ni

Distribution:

- worldwide except Australasia
- sporadic in tropics
- attacks non crucifers





Symptoms of damage

- irregular holes in leaves
- larvae bore in cabbage head
- frass pellets on inner leaves







Life-cycle

- Eggs singly, lower leaf surface
- typical looper larvae
- 3 pairs of legs + 2 pairs of prolegs, 5-6 segment
- white line over spiracle
- 5 instars
- pupation in debris on soil
- large moth











Aphids Cabbage aphid:

Brevicoryne brassicae

Turnip aphid: Lipaphis erysimi Green Peach Aphid: Myzus persicae







Distribution:

mainly in temperate region cool, dry areas of tropics





Symptoms of damage

- sucking plant juices
- general weakening
- black sooty mold growth
- virus vector









Life-cycle

- cabbage aphid: only females, alate + apterous
- turnip aphid: only females
- green peach aphid:
- sexual and asexual forms
- asexual form in tropics
- sexual form in cool highlands
- alate, apterous, viviparious
- crowding, temp, photoperiod, nutrition cause migration
- physiological races

Okra (Abelmoschus esculentus)







Cotton Leafhopper

(Amrasca devastans); also known as Amrasca biguttula biguttula Distribution: South- and Southeast Asia Hosts: cotton, okra, eggplant, potato, sunflower, etc



"Hopper Burn"





Cotton or melon aphid (Aphis gossypii)





Whitefly (Bemisia tabaci)

Bhendi yellow vein mosaic virus, transmitted by whitefly





Okra shoot & fruit borer

Earias vittella (Spotted bollworm) *Earias insulana* (Spiny bollworm)





Egg

- laid singly
- light-bluish, reticulation
- on shoot tips, buds, flowers
- 3-7 days, temp. effect





Larvae

- Neonate, 1.3 mm
- wander few hours
- bore in shoot, flower buds, fruits
- 5 instars
- 10-16 days
- white median longitudinal steak
- descend to soil pupation







Pupation

- 20 30 cm deep, or soil surface
- boat shaped cocoon
- dirty white to light brown
- 8-14 days





Adult moths

- emergence at dusk
- buff, medium size
- 13-15mm long, 30-34mm wing-exp
- forewing pale, green horizontal wedge
- hind wing, creamy white
- 8-22 days









- life-cycle 22-25 days
- 74 days in winter
- 8-12 generations
- no hibernation
 - slow down in winter
 - larva over-winter in cotton bolls
- throughout year
 - high temp + humidity prefer
- okra in summer \Rightarrow cotton in winter



Nature of damage (Young plants)

- larva bore in shoots
- withering, drooping
- growing point destroyed
- side shoots
- bushy appearance









Nature of damage (Mature plants)

- caterpillar bore into
 - buds, flowers, fruits
- caterpillars move between parts
 - increase damage
- flower buds wither
 - no fruits
- damaged fruits - direct yield loss





Red cotton bug or Red cotton stainer, *Dysdercus cingulatus* (Hemiptera: Pyrrhocoridae)



Blister beetle in Africa (Coleoptera: Meloidae)

Blister beetle in Asia Mylabris pustulata (Coleoptera: Meloidae)





Pink or Hibiscus mealy bug Maconellicoccus hirsutus (Hemiptera: Pseudococcidae)











Leaf beetle in Africa, *Podagrica* spp. (Coleoptera: Chrysomelidae)

Grasshoppers / Locusts

Cotton leaf roller, Sylepta derogata (Lepidoptera: Crambidae)

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Cucurbits





Major fruit fly species

- Melon fly *Bactrocera cucurbitae*
- Oriental fruit fly Bactrocera dorsalis
- Host preference
- Distribution
 - Africa
 - South- and Southeast Asia, Middle east
 - Oceania & USA





Eggs -soft fruit tissue -underneath epidermis -plug oviposition hole - hard brown tissue* - 40 - 1000 large eggs* - 0.8 mm X 0.2 mm - hatch 1-2 days











Larva

- large larva*
 - 9-11 mm X 1-2 mm
- 3 instars
- 4-11 days
- fruit-fruit movement rare
- jump for pupation







Pupation

- larva burrow in soil
 - 4-5 cm
- barrel shaped, yellow pupa*
- 7-13 days
 - cold temp. much longer





Adult

- present year-round
- large brown fly*
 - -8-10 mm long
 - -12-14 mm wings exp.
- morphology
- feeding: nectar, plant sap
- longevity <u>5-15 months</u>
- spread 50-100 km









Nature of damage

- infestation duration

- flowering - fruiting

- fruits, inflorescence, leaves, stems

- oviposition punctures
- larval feeding on pulp*
- fruit small + yellow
- galling









Pumpkin beetles, Aulacophora spp.



Red pumpkin beetle, Aulacophora foveicollis (Coleoptera: Chrysomelidae)







Blue pumpkin beetle, Aulacophora nigripennis (Coleoptera: Chrysomelidae)

Spotted beetle, *Epilachna* spp. (Coleoptera: Coccinellidae)

Million







Leaf beetles (Monolepta semiviolacea & M. nigroapicata)

Leafminer, *Liriomyza* spp. (Diptera: Agromyzidae)





Whiteflies, Bemisia tabaci Trialeurodes vaporariorum (Hemiptera: Aleyrodidae)

11 - 42 15





Aphid, Aphis gossypii



Cucumber mosaic virus Transmitted by aphids Spider mite, *Tetranychus* spp.



Cucumber moth, *Diaphania indica* (Lepidoptera: Crambidae)





Damage symptoms











Life stages













Onion thrips, *Thrips tabaci* (Thysanoptera: Thripidae)







Biology of onion thrips

Eggs

Pupae

- inserted into leaf
 in soil
 tissues
 no put
- Larvae
- I & II instars
- <1 mm long
- gregarious
- leaf axils

- no pupal case
 Adults
- 1 mm long
- 7 segmented antennae
- longevity, 2-4 weeks
- fecundity, 60-80 eggs









Nature of damage

- rasping on leaf surface
- sucking cell sap
- feeding patches
- leaf necrosis
- death of plant
- old foliage preferred over younger
- adults occasionally pollen feeders







Beet armyworm, *Spodoptera exigua* (Lepidoptera: Noctuidae)





Biology

Eggs

- up to 600
- egg masses, light yellow scale
- incubation 2-4 days

Larvae

- gregarious I & II
- inside tubular leaves
- 6 instars
- conspicuous stripes
- 2-3 weeks



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Biology

Pupae

- in soil
- brown, shining
- 5-7 days



Adult







Nature of damage

- initial scrape leaf surface
- enter tubular leaves
- feed from inside
- leaves die-off





Onion aphid, *Neotoxoptera formosana*

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Neotoxoptera formosana (NEOTFO) - https://gd.eppo.int
Amaranth





Leaf webber, *Spoladea recurvalis* (Lepidoptera: Crambidae)







Eggs

- Flattened, elliptical, pearly-white surface
- Laid single or in small groups
- On lower leaf surfaces

Larvae

- 1.5 cm long
- green body with a transparent epidermis
- two longitudinal white wavy lines
- 5 instars
- changes color from green to yellow to brown to bright pink in prepupa



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Biology Pupae

- Cocoons in soil or occasionally in leaves
- Yellowish brown
- 1 cm long

Adult

- Dark brown moth
- Two white translucent bands on the forewings, & one on hindwings
- These bands form a continuous arch pattern when the wings are spread







Nature of damage

- rolled or folded leaves & internal feeding
- complete defoliation leaving the veins
- occasionally boring the growing tips
- also feeding on inflorescence





