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Major Insect Pests of Radish (*Raphanus sativus*) and Their Management

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Radish is a quick-growing, cool-season root crop valued for its crisp roots and leaves. However, it is attacked by several insect pests that can significantly reduce yield and market quality if not managed properly. Below is a comprehensive overview of the most important insect pests of radish worldwide and their integrated management strategies.

1. Flea Beetles (*Phyllotreta spp.*, especially *Phyllotreta cruciferae* and *P. striolata*)
Damage: Small, shiny beetles (1.5–3 mm) that chew numerous tiny holes ("shot-holes") in leaves, giving a lace-like appearance. Severe infestation in seedlings can kill young plants.
Identification: Metallic blue-black or striped beetles that jump vigorously when disturbed.

Management:
- Use floating row covers immediately after sowing/planting.
- Apply spinosad, pyrethrin, or neem-based insecticides at the cotyledon stage (most vulnerable period).
- Plant trap crops (e.g., mustard or Chinese radish) around the main crop.
- Mulch heavily to disrupt beetle movement.
- Rotate with non-crucifer crops.

2. Cabbage Root Fly / Radish Maggot (*Delia radicum*, formerly *Hylemya brassicae*)
Damage: White legless maggots (up to 8 mm) tunnel into roots, creating brown winding trails and entry/exit holes. Affected roots become unmarketable and susceptible to rot.
Identification: Adult is a greyish fly resembling a small housefly; eggs laid at base of stem.
Management:
- Use insect-proof mesh or row covers from sowing until harvest.

- Place 10–15 cm diameter collars (felt, cardboard, or fleece discs) around the base of each plant to prevent egg-laying.
- Apply entomopathogenic nematodes (*Steinernema feltiae* or *Heterorhabditis bacteriophora*) to soil when soil temperature is 10–20 °C.
- Avoid planting radish after other brassicas; practice crop rotation.
- Drench with approved insecticides (chlorpyrifos or cypermethrin where permitted).

3. Aphids (Mainly Cabbage Aphid, *Brevicoryne brassicae* and Turnip Aphid, *Lipaphis erysimi*)

Damage: Colonies on undersides of leaves and growing tips cause curling, yellowing, stunting, and transmission of viruses (e.g., Turnip mosaic virus).

Identification: Greyish-white (cabbage aphid) or greenish-yellow waxy aphids.

Management:

- Encourage natural enemies: ladybird beetles, syrphid fly larvae, lacewings, parasitic wasps (Diaeretiella rapae).
- Spray insecticidal soap, neem oil, or 0.5–1% liquid detergent solution.
- Use reflective mulches (silver plastic) to repel aphids.
- Remove and destroy heavily infested plants.

4. Diamondback Moth (*Plutella xylostella*) – More serious in tropical/subtropical areas

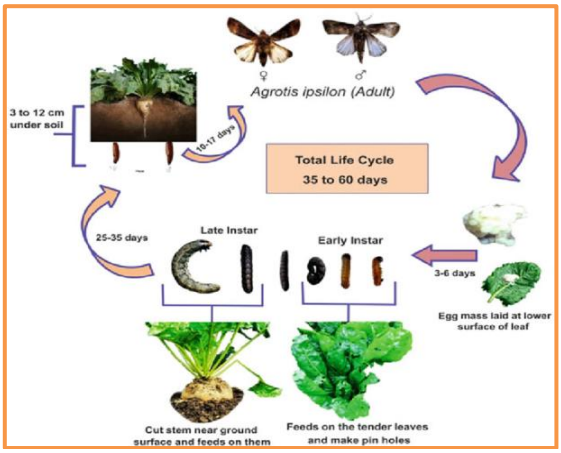
Damage: Young larvae mine leaves; older larvae chew irregular holes and contaminate leaves with frass.

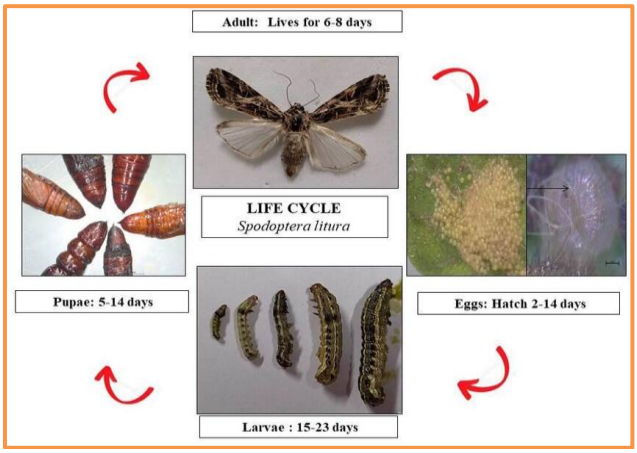
Management:

- Monitor with pheromone traps.
- Apply *Bacillus thuringiensis* subsp. *kurstaki* (Bt) or *aizawai* when larvae are small.
- Conserve parasitoids (*Diadegma, Cotesia, Oomyzus*).
- Use neem or spinosad.

5. Cutworms (*Agrotis spp*., *Spodoptera spp*.)

Damage: Nocturnal caterpillars cut seedlings at ground level at night.





Management:

- Keep field weed-free before planting.
- Place collars (paper cups, toilet paper rolls) around seedlings.
- Hand-pick at night with flashlight.
- Apply baits containing *Bacillus thuringiensis* or spinosad around plants.

6. White Grubs and Wireworms (Larvae of scarab beetles and click beetles)

Damage: Feed on roots underground; plants wilt suddenly.

Management:

- Deep summer ploughing to expose larvae to predators and sun.
- Soil application of Photorhabdus or Heterorhabditis entomopathogenic nematodes.
- Seed treatment or soil incorporation of imidacloprid or fipronil (where permitted).

Integrated Pest Management (IPM) Strategy for Radish

1. Cultural Practices
- Crop rotation (avoid brassicas for 2–3 years)
- Early or delayed sowing to escape peak pest periods
- Use of resistant/tolerant varieties (e.g., 'Cherry Belle', 'Red King', '*Longipinnatus'* group often less susceptible)
- Sanitation – destroy crop residues immediately after harvest

2. Physical/Mechanical
- Row covers and stem collars (highly effective against root fly)
- Yellow sticky traps for aphids and flea beetles
- Trap crops (mustard, rape)

3. Biological Control
- Release or conserve natural enemies
- Entomopathogenic nematodes for root maggots and grubs
- *Bacillus thuringiensis* products

4. Chemical Control (as last resort)
- Seed treatment with imidacloprid 70WS or thiamethoxam 35FS
- Foliar sprays of spinosad, emamectin benzoate, chlorantraniliprole, or cyantraniliprole
- Always follow local registration and pre-harvest intervals (radish has very short crop cycle, 25–45 days).

Quick Reference Table of Key Pests and Critical Interventions

Pest	Most Vulnerable Stage	Best Preventive Measure	Best Curative Measure
Flea beetle	Cotyledon–4 leaf	Row cover + mulch	Spinosad or pyrethroid spray
Cabbage root fly	Egg-laying at stem base	Disc collar + fine mesh	Entomopathogenic nematodes
Aphids	Throughout	Reflective mulch + predators	Insecticidal soap or neem
Diamondback moth	Young larvae	Bt monitoring + early spray	Spinosad or chlorantraniliprole
Cutworms	Seedling	Paper collar	Bt bait or hand picking