

Pechay

Crop group: Brassicaceae (pechay)

Summary

The best insect pest and disease management is prevention and knowledge. Each farm will usually have only a few insect pests and diseases that regularly infest or infect their pechay and usually one or two regularly cause major crop loss unless actively managed.

Learning which are the major insect pests or diseases, early signs of infestation or infection, understanding what conditions favour their growth and what are their natural enemies lead to specific management practices that will give the best outcomes (Refer to the pest and disease specific factsheets for more information). However, there are some general crop management or “cultural” practices that can be used to reduce chances of bringing pests and diseases into crops and minimising their spread if present. Pechay crops that have optimal (not too much or too little) nutrition and water, and are growing in environmental conditions that they are suited to, will grow more quickly, produce higher yields and in general be more resistant to disease infection and outgrow damage (See the Best Practice Guides for Pechay).

Site selection

Practice crop rotation and choose a site that has not recently grown Brassica crops such as: pechay, cauliflower, cabbage or broccoli to reduce carry over of insect pests or of soil borne diseases. To reduce movement of insect pests or diseases from the older to younger crop do not plant next to, down-wind or down-slope of an older pechay crop.

Land preparation

Waterlogging favours many soilborne diseases, stops plants growing and reduces their chance of resisting infection or infestation, so good drainage is important. Raised beds, soil amendments and protected cropping can reduce chances of waterlogging. Where possible align beds in direction of prevailing winds to maximise airflow to reduce leaf wetness.



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Seedling production

Use certified disease-free seed and clean planting materials. Clean media for planting seeds (sterilized best), monitor seedlings, grow seedlings away from main production area and net well to prevent pest infestation. Check seedlings are pest and disease free before transplanting (see Best Practice Guide to Seedling Production).

Transplanting

Handle seedlings with care when pricking and transplanting. Extra care should be done to minimise root wounding. Fungicide drenching may be applied to newly transplanted seedlings to protect them from soil-borne fungi. Alternatively, 200 ppm chitosan solution can be applied to the seedlings by root drenching during transplanting.

Use sticky traps around seedling production area and in newly transplanted crop for flea beetles and sucking insects.

Vegetative

Monitor establishing plants, check leaf terminals for distortion from aphids or cabbage webworms. Look for leaf feeding; small shot-holes indicate flea beetle feeding, skeletonised leaves can be caused by diamond back moth (DBM) larvae or cabbage webworm and small cutworm larvae, and larger ragged holes are from larger cutworm larvae and DBM. Silver white trails within the leaf indicate leafminers. Check undersides of leaves for whiteflies, aphids and caterpillars and caterpillar eggs. Where possible squash eggs, aphids and newly hatched caterpillars. Not all insects that are seen in crops are causing economic losses. Many are 'natural enemies' or 'beneficials' and need to be maintained to assist in managing pest insect populations. Learn to recognise the common natural enemies. Monitor pest and natural enemy populations 1–2 times per week and record numbers per plant to track whether populations are increasing or decreasing. If pest populations are increasing and natural enemies absent or in very low numbers an insecticide spray may be needed. Where possible choose insecticides that are specific to the pest group and least toxic to natural enemies and humans. Always read the label and use appropriate personal protection when spraying.

Monitor the plants for disease symptoms such as wilting, stem and leaf rots, white hairy growth around affected areas or on underside of leaves and leaf spots or blights. Rogue infected plants showing disease symptoms, put in bag and leave in sun for a few days or bury away from production area. Wash hands with soap after handling diseased plants before touching other non-diseased plants. Avoid moving soil from area with high disease into areas of low disease. Control weeds to minimize alternate reservoir of plant pathogens or vectors of plant diseases.

Most pechay diseases are favoured by excess water. Grow on beds, improve drainage, avoid over watering or wetting leaves, or use protected cropping. In situations with continual disease pressure reduce planting density to improve leaf drying. Isolate diseased spots. Prevent water flow in or out of the section and limit the traffic of people and machinery in the infested area. More frequent irrigation for a shorter time is less favourable for disease.

Avoid excessive nitrogen fertilization especially with ammonium forms of fertilizer since they will make plants susceptible to most pests and diseases. Fungicides can be applied to control fungal diseases.

Harvesting

Avoid harvesting during rainy days and when the conditions are wet. Avoid contaminating leaves with soil. Best to pack pechay when leaves are dry.

Postharvest

As soon as possible after harvest uproot any infested or unharvested pechay and dispose by burying or composting to ensure pests or diseases cannot develop.

In the tables below are some of the common major diseases or pests that can be found in pechay and a summary of useful information. See the individual disease or pest factsheets for more detailed information.

Proper identification of the problem is a pre-requisite for effective pest and disease management.

Table 1. Major diseases of pechay





Image	Disease name	Damage symptoms	Management strategies
	Soft rot (<i>Pectobacterium carotovorum</i>)	Bacterial soft rots cause water soaked spots which eventually enlarge over time and become sunken and soft. As plant tissues break down and die they release a strong odour.	Avoid waterlogged soils. Improved drainage. Grow plants under protected structures.
	Damping off (<i>Pythium</i> spp. and <i>Rhizoctonia solani</i>)	At seedling stage, the stem at ground level becomes thin, brown and plants fall over. Root system becomes brown.	Use clean or treated soil/media for seedlings. Remove infected plants and destroy. Avoid using rice hulls on the bed surface unless they have been composted or carbonized. Avoid over watering and excess fertilizer use.
	Phytophthora blight (<i>Phytophthora</i> spp.)	Rapid blighting of leaves, shoots and whole plant. White mycelial growth on the surface is present, especially in very humid conditions. Plants under moist conditions become weak and die eventually.	Practice good crop sanitation. Avoid planting during prolonged wet and cool weather. Carefully remove infected plants from the garden to minimize source of inocula. Destroy infected plants immediately by burying. Water plants early in the day rather than late in the day. Plant pechay under protective structures if possible.
	Sclerotium rot (<i>Sclerotium rolfsii</i>)	Loss of vigor, wilting leading to death of affected plants. Rotting of the stem, starting at the base, with the formation of a dense white mycelium that later turn into smooth spherical structures measuring ~1–3 mm in diameter. These are initially white, then light brown and later dark brown structures called sclerotia.	Practice sanitation in the nursery and farm. Ensure all equipment is free of soil before being brought to a farm or transferred from farm to farm. Rapidly eliminate plants that show initial symptoms of the disease and quarantine the area where it is found. Disinfect hands after handling infected plants. Long rotation with non-host plants (4–6) years may reduce pathogen in the soil.




Image	Disease name	Damage symptoms	Management strategies
	Blight (<i>Choanephora cucurbitarum</i>)	Water soaked lesions appear on the leaves, with the margins and leaf tips becoming blighted. In severe conditions, the entire plant may wilt. Presence of a stiff, silvery mass of hairy strands growing out of the affected leaf tissue, topped with a black ball.	Avoid overhead irrigation.
	Downy mildew (<i>Pseudoperonospora</i> sp.)	Yellow spots on leaves, turning brown. Grey mould present on lower leaf surface. Especially a problem during rainy season.	Remove and destroy leaves. Reduce planting density to improve ventilation. Avoid overhead irrigation, particularly late in the day.
 <i>Image on lettuce leaves</i>	Leaf spot (<i>Curvularia lunata</i>)	Light brown spots on leaves. Spots coalesce to form blighted areas	Use healthy seedlings. Practice sanitation in the field. Prune and properly dispose of infected plants. Fungicides

Table 2. Major pests of pechay


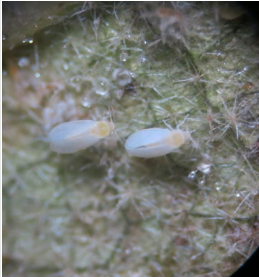






Image	Pest name	Damage symptoms	Management strategies
	Aphids (<i>Aphis gossypii</i> , <i>Myzus persicae</i>)	Deformed leaves, curling, stunted growth. Ants and sooty mould usually seen at high aphid populations.	Maintain beneficials such coccinellids, syrphids and parasitic wasps and <i>Metarrhizium</i> Spray soap solution. Pressurised water spray Biologicals Botanicals Pesticides
	Whiteflies (<i>Bemisia tabaci</i>)	Adults suck sap, causing deformed leaves at high populations.	Yellow sticky traps (for monitoring and control). Intercrop using non-hosts crops. Remove weeds. Removal and destruction of infested crops. Soap spray Pressurized water spray

Image	Pest name	Damage symptoms	Management strategies
	Cutworm (<i>Spodoptera litura</i>)	Chew and make irregular holes on the leaves.	Collect egg masses and larvae. Plant trap crops such as castor plant. Plough soil to minimise pupae survival between crops. Biologicals
	Diamond back moth (<i>Plutella xylostella</i>)	Larval feeding cause skeletonized leaves and webbing on the leaves.	Monitor for larvae and parasitism. Releases of larval parasitoids, <i>Diadegma semiclausum</i> .
 	Cabbage webworm (<i>Crociodomia binotalis</i>)	Eggs laid in mass, larvae in clusters, webbing and feeding at the growing tip.	Monitoring and removal of egg mass and larvae. Biologicals Pesticides
	Leafminer (<i>Liriomyza</i> spp.)	Eggs laid by flies within leaf tissue, white/silver trails seen where larvae tunnel inside leaf. Particularly serious in seedlings. Damage serves as entry points for bacterial and fungal infection. Only serious in seedlings.	Use yellow sticky traps to reduce adult populations. Remove host weeds. Destroy crop residues.
	Flea beetles (<i>Phyllotreta vittula</i>)	Adults eat small circular holes ('shot-hole') in leaves.	Remove alternate weed hosts. Maintain field sanitation. Practice crop rotation. Synthetic pyrethroids Pesticides

Refer to the Pesticide table for further information.

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For more information, see individual factsheets and crop best practice guides also produced from this project.

Other information available from www.plantwise.org.

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