

Vegetable	Description	Diseases	Pests
1. Pechay	It is one of the leafy vegetables that may be grown in containers with ease. It is a highly well-liked vegetable in Southeast Asian and Chinese cooking. They are also referred to as "pak choy" or "bok choy" in western nations. The smooth, deep-green leaves of the pechay plant grow in a cluster like that of mustard greens.	<ul style="list-style-type: none"> <li>• Soft rot - 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.</li> <li>• Damping off - At seedling stage, the stem at ground level becomes thin, brown and plants fall over. Root system becomes brown.</li> <li>• Phytophthora blight - 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.</li> <li>• Sclerotium rot - 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.</li> <li>• Blight - Water soaked lesions appear on the leaves, with the margins and leaf tips becoming blighted. In severe conditions, the entire plant</li> </ul>	<ul style="list-style-type: none"> <li>• Aphids - Deformed leaves, curling, stunted growth. Ants and sooty mold usually seen at high aphid populations.</li> <li>• Whiteflies - Adults suck sap, causing deformed leaves at high populations.</li> <li>• Cutworm - Chew and make irregular holes on the leaves.</li> <li>• Diamond back moth - Larval feeding cause skeletonized leaves and webbing on the leaves.</li> <li>• Cabbage webworm - Eggs laid in mass, larvae in clusters, webbing and feeding at the growing tip.</li> <li>• Leafminer - 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.</li> </ul>

		<p>may wilt. Presence of a stiff, silvery mass of hairy strands growing out of the affected leaf tissue, topped with a black ball.</p> <ul style="list-style-type: none"> <li>• Downy mildew – Yellow spots on leaves, turning brown. Grey mold present on lower leaf surface. Especially a problem during rainy season.</li> <li>• Leaf spot - Light brown spots on leaves. Spots coalesce to form blighted areas</li> </ul>	
<b>2. Mustasa</b>	<p>Mustard greens are peppery-tasting greens that come from the mustard plant. They are members of the Brassica genus of vegetables. This genus also includes kale, collard greens, broccoli, and cauliflower. There are several varieties, which are usually green and have a strong bitter, spicy flavor. To make them more palatable, these leafy greens are typically enjoyed boiled, steamed, stir-fried, or even pickled.</p>	<ul style="list-style-type: none"> <li>• Alternaria leaf spot - Small dark spots on leaves which turn brown to gray; lesions may be round or angular and may possess a purple-black margin; lesions may form concentric rings, become brittle and crack in center; dark brown elongated lesions may develop on stems and petioles.</li> <li>• Downy mildew - Irregular yellow patches on leaves which turn light brown in color; fluffy gray growth on the undersides of the leaves.</li> <li>• Powdery mildew - Small white patches on upper and lower leaf surfaces which may also show purple blotching; patches coalesce to form a dense powdery layer which coats the leaves; leaves become chlorotic and drop from</li> </ul>	<ul style="list-style-type: none"> <li>• Aphids - Green or black soft-bodied insects that feed on underside of leaves. Leaves become crinkled and curled.</li> <li>• Cabbage Worms and Loopers – Worms and loopers are light to dark green. Adult loopers are gray or brown moths while cabbage worms are white butterflies. Worms and loopers chew holes in leaves and hide in kohlrabi leaves.</li> <li>• Flea Beetles - Small black beetle that feed on seedlings. Adults chew tiny holes in cotyledons and leaves. Beetles can reduce plant stands or may kill seedlings.</li> <li>• Slugs - Soft-bodied or shelled mollusks that chew holes in leaves.</li> </ul>

		<p>plant.</p> <ul style="list-style-type: none"> <li>• Sclerotinia stem rot - Irregular, necrotic gray lesions on leaves; white-gray lesions on stems; reduced pod set; shattering seed pods.</li> <li>• White leaf spot - Small, necrotic, brown spots on leaf tips or margins that matures to light gray or white with the original dark spot in center; margins of lesions may be darker; lesions may coalesce to form large chlorotic areas and cause defoliation.</li> <li>• White rust - White pustules on cotyledons, leaves, stems and/or flowers which coalesce to form large areas of infection; leaves may roll and thicken.</li> <li>• Bacterial black rot - Irregularly shaped dull yellow areas along leaf margins which expand to leaf midrib and create a characteristic "V-shaped" lesion; lesions may coalesce along the leaf margin to give plant a scorched appearance.</li> </ul>	
<b>3. Eggplant</b>	Eggplant ( <i>Solanum melongena</i> esculentum) is a tender perennial plant of the nightshade family (Solanaceae). It is	<ul style="list-style-type: none"> <li>• Blossom-end rot - Small water-soaked area on end of fruit where the blossom was occurring on unripe fruit; lesion enlarges and turns sunken, black and leathery in appearance.</li> </ul>	<ul style="list-style-type: none"> <li>• Aphids (Peach aphid, Potato aphid) - Small soft bodied insects on underside of leaves and/or stems of plant; usually green or yellow in color, but may be pink, brown,</li> </ul>

	<p>erect, bushy with stem sometimes armed with few spikes. Its leaves are large, ovate and slightly lobed. The shape and color of fruits depend on the variety.</p>	<ul style="list-style-type: none"> <li>• Cercospora leaf spot - Symptoms appear first on lower part of plant and move upwards; initial symptoms are small circular or oval chlorotic spots on leaves which develop light to dark brown centers; as the lesions expand, they may develop concentric zones; severely infested leaves may dry out and curl then drop from the plant.</li> <li>• Colletotrichum fruit rot - Sunken lesions on the fruit filled with pinkish fungal ooze; severely infected plants drop to the ground with the pedicel still attached.</li> <li>• Damping-off - Failure of seedling to emerge; light brown, seedlings with light brown to redwater-soaked roots and stems; collapse of plants; plant dry up and die; stunted plant growth; rotting taproot with few lateral roots</li> <li>• Early blight - Premature dropping of lower leaves; brown-black spots on leaves; spots covering leaf surface; alternating rings of light and dark on leaves; yellowing dry leaves; large sunken area of concentric rings and black velvety texture at stem end of fruit</li> <li>• Phomopsis fruit rot - Circular brown spots with</li> </ul>	<p>red or black depending on species and host plant; if aphid infestation is heavy, it may cause leaves to yellow and/or be distorted, necrotic spots on leaves and/or stunted shoots; aphids secrete a sticky, sugary substance called honeydew which encourages the growth of sooty mold on the plants.</p> <ul style="list-style-type: none"> <li>• Colorado potato beetle - Feeding damage to foliage; if infestation is severe or if left untreated plants can be completely defoliated; adult insect is a black and yellow striped beetle; larvae are bright red with black heads when they first hatch and change color to pink; larvae have two rows of black spots.</li> <li>• Cutworms - Stems of young transplants or seedlings may be severed at soil line; if infection occurs later, irregular holes are eaten into the surface of fruits; larvae causing the damage are usually active at night and hide during the day in the soil at the base of the plants or in plant debris of toppled plant; larvae are 2.5–5.0 cm (1–2 in) in length; larvae may exhibit a variety of patterns and coloration but are usually dirty gray or brown to black with dark</li> </ul>
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			<p>initially light green in color and turn white prior to hatching</p> <ul style="list-style-type: none"> <li>• Stinkbugs - Dark colored pinpricks on fruit surrounded by a lighter area that turns yellow or remains light green; stink bugs often carry pathogens in their mouthparts which can cause secondary infections and decay of fruit; adult insect is shield-shaped and brown or green in color; may have pink, red or yellow markings; eggs are drum shaped and laid in clusters on the leaves; larvae resemble the adults but are smaller</li> <li>• Mites (Carmin mite, Two-spotted spider mite) - Leaves stippled with yellow; leaves may appear bronzed; webbing covering leaves; mites may be visible as tiny moving dots on the webs or underside of leaves, best viewed using a hand lens; usually not spotted until there are visible symptoms on the plant; leaves turn yellow and may drop from plant</li> </ul>
<b>4. Bitter Gourd</b>	Bitter gourd or <i>Momordica charantia</i> gets its name from the Latin word " <i>momordica</i> ", which means "to bite", referring to	<ul style="list-style-type: none"> <li>• Powdery Mildew - This disease is favored by high humidity and tends to occur on older leaves first. Symptoms first appear as white powdery residue primarily on the upper leaf</li> </ul>	<ul style="list-style-type: none"> <li>• Red Pumpkin Beetle - The pest attacks the melons at the seedling stage. They make holes in cotyledonary leaves of watermelon. As a result, the seedlings in the young stage die.</li> </ul>

	<p>the grooved edges of its seed which looks as if it has been chewed. It is a member of the gourd family (e.g., squash, cucumbers). Actually, bitter gourd looks somewhat like a cucumber with lots of warts. Despite its rather unflattering appearance and bitter flavor, it is one of the most nutritious gourds. Moreover, it is one of the most versatile vegetables that have multiple and integral uses. In Southeast Asia, bitter gourd is mostly grown for the local market.</p>	<p>surface. On the lower surface of the leaves circular patches or spots appear. In severe cases, this spread, coalesce and cover both the surfaces of the leaves and spread also to the petioles, stem, etc. Severely attacked leaves become brown and shriveled and defoliation may occur. Fruits of the affected plants do not develop fully and remain small.</p> <ul style="list-style-type: none"> <li>• Fusarium Wilt - Initially the plants show temporary wilting symptoms, which becomes permanent and progressive, affecting more vines. The leaves of the affected plants show yellowing, loose turgidity and show drooping symptoms. Eventually, the plant dies. The roots are not affected. In older plants, leaves wilt suddenly and vascular bundles in the collar region become yellow or brown.</li> <li>• Downey Mildew - It is prevalent in areas of high humidity, especially when summer rains occur regularly. The disease is first seen as yellow angular spots on the upper surface of the leaves. Under conditions of high humidity, whitish powdery growth appears on the</li> </ul>	<ul style="list-style-type: none"> <li>• Aphids - Aphids damage the plants by sucking the leaf sap. in young stage, cotyledonary leaves crinkle and in severe cases the plants wither. The leaves of fully grown vines turn yellow and plant loses its vigor.</li> <li>• Fruit Fly - The fly attack is severe, especially after summer rains when the humidity is high. Maggots of this fly causes severe damage to young developing fruits. The adult fly lays eggs in the flowers. The eggs hatch into maggots, which feed inside the fruits and causes rotting.</li> </ul>
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lower surface of the leaves. The disease spreads rapidly killing the plant quickly through rapid defoliation.

- Bitter Gourd Mosaic - This virus disease is mostly confined to the leaves with symptoms appearing on the leaves in the secondary branches produced at the apical end of the plant. Small irregular yellowish patches are seen on the leaves. Some leaves show vein clearing in one or two lobes of the leaf and severely infected plants show reduction in leaf size and elongation and/or suppression of one or two lobes. Young developing leaves are completely distorted and malformed with considerable reduction in their size. Some of the leaves show marked reduction in the development of lamina resulting in a shoestring effect. The virus is transmitted by five species of aphids.
- Bitter gourd Witches' Broom - Plants infected in the early stages do not bear any fruit and the loss is 100%. Characteristic symptoms of this disease are malformation and proliferation of axillary buds. Diseased plants show many abnormally little



		<p>leaves, which fail to attain full size. The diseased plants bear many flowers and blossom earlier than healthy plants. Flowers on infected plants show characteristic green, phyllody symptoms. Fruit formation is noticed from the flowers partially infected with the disease. Fruits from these flowers are very small, cylindrical and deformed. The outer surface of the fruits is smooth and fruits are completely seedless. Plants showing severe witches' broom do not bear any fruit.</p>	
<b>5. String Beans</b>	<p>String beans or sitao is one of the most widely grown vegetables in the Philippines. It is a true legume and botanically more closely related to cowpea. The tender pods are edible while the skin is still smooth and before seeds mature or expand. The young leaves and stem can be boiled or steamed and eaten as green vegetables.</p>	<ul style="list-style-type: none"> <li>• Alternaria leaf spot - Small irregular brown lesions on leaves which expand and turn gray-brown or dark brown with concentric zones; older areas of lesions may dry out and drop from leaves causing shot hole; lesions coalesce to form large necrotic patches</li> <li>• Anthracnose - Small, dark brown to black lesions on cotyledons; oval or eye-shaped lesions on stems which turn sunken and brown with purple to red margins; stems may break if cankers weaken stem; pods drying and shrinking above areas of visible symptoms; reddish brown</li> </ul>	<ul style="list-style-type: none"> <li>• Aphids (Cowpea aphid, Pea aphid, etc.) - Small soft bodied insects on underside of leaves and/or stems of plant; usually green or yellow in color, but may be pink, brown, red or black depending on species and host plant; if aphid infestation is heavy, it may cause leaves to yellow and/or distorted, necrotic spots on leaves and/or stunted shoots; aphids secrete a sticky, sugary substance called honeydew which encourages the growth of sooty mold on the plants.</li> <li>• Armyworms (Beet armyworm, Western striped armyworm) -</li> </ul>

		<p>spots on pods which become circular and sunken with rust colored margin</p> <ul style="list-style-type: none"> <li>• Bean rust - Initially the symptoms appear as small yellow/white spots on leaves. Later the spots become enlarged and shows raised brick red rust pustules (uredinia). Normally these pustules are surrounded by a yellow halo. Premature leaf drop may occur if the disease is severe.</li> <li>• Black root rot - Elongated red-purple lesions on root tissue which turns dark gray to black; lesions coalesce to form large dark areas on roots and stems; deep lesions can cause stunted growth, wilting leaves, defoliation and plant death.</li> <li>• Fusarium root rot - Young plants stunted with chlorotic leaves; older plants with chlorotic leaves and some leaf drop; severely decayed roots which are hollow and dry.</li> <li>• White mold - Flowers covered in white, cottony fungal growth; small, circular, dark green, water-soaked lesions on pods leaves and branches which enlarge and become slimy; cottony white growth may be visible on lesions during</li> </ul>	<p>Singular, or closely grouped circular to irregularly shaped holes in foliage; heavy feeding by young larvae leads to skeletonized leaves; shallow, dry wounds on fruit; egg clusters of 50-150 eggs may be present on the leaves; egg clusters are covered in a whitish scale which gives the cluster a cottony or fuzzy appearance; young larvae are pale green to yellow in color while older larvae are generally darker green with a dark and light line running along the side of their body and a pink or yellow underside.</p> <ul style="list-style-type: none"> <li>• Corn earworm - Larvae damage leaves, buds, flowers, pods and beans; young caterpillars are cream-white in color with a black head and black hairs; older larvae may be yellow-green to almost black in color with fine white lines along their body and black spots at the base of hairs; eggs are laid singly on both upper and lower leaf surfaces and are initially creamy white but develop a brown-red ring after 24 hours and darken prior to hatching.</li> <li>• Cutworms - Stems of young transplants or seedlings may be severed</li> </ul>
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		<p>periods of high humidity; death of branches and/or entire plant.</p> <ul style="list-style-type: none"> <li>• Bacterial blight - Water-soaked spots on leaves which enlarge and become necrotic; spots may be surrounded by a zone of yellow discoloration; lesions coalesce and give plant a burned appearance; leaves that die remain attached to plant; circular, sunken, red-brown lesion may be present on pods; pod lesions may ooze during humid conditions.</li> <li>• Bacterial brown spot - Small, dark brown necrotic spots on leaves which may be surrounded by a zone of yellow tissue; water soaked spots on pods which turn brown and necrotic; pods may twist and distort in area of infection.</li> <li>• Halo blight - Small water-soaked spots on underside of leaves which turn necrotic and become visible on upper surface; lesions may develop an area of chlorotic tissue around the spots; lesions on expanding leaves may cause distorted leaves; red-brown lesions may be visible on pods; pod lesions may ooze or may turn tan in color.</li> <li>• Damping-off - The pathogens attack any stage</li> </ul>	<p>at soil line; if infection occurs later, irregular holes are eaten into the surface of fruits; larvae causing the damage are usually active at night and hide during the day in the soil at the base of the plants or in plant debris of toppled plant; larvae are 2.5–5.0 cm (1–2 in) in length; larvae may exhibit a variety of patterns and coloration but will usually curl up into a C-shape when disturbed.</p> <ul style="list-style-type: none"> <li>• Leafminers - Thin, white, winding trails on leaves; heavy mining can result in white blotches on leaves and leaves dropping from the plant prematurely; early infestation can cause fruit yield to be reduced; adult leafminer is a small black and yellow fly which lays its eggs in the leaf; larvae hatch and feed on leaf interior.</li> <li>• Loopers (Cabbage looper, Alfalfa looper) - Large or small holes in leaves; damage often extensive; caterpillars are pale green with a white lines running down either side of their body; caterpillars are easily distinguished by the way they arch their body when moving; eggs are laid singly, usually on the lower leaf surface close to the leaf margin, and are white</li> </ul>
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		<p>of crop beginning from seed rot; damping off of seedlings; or stunting, yellowing and death of older plants. Visible symptoms are the appearance of elongated sunken reddish-brown lesions on roots and stems at or below the soil line. Further the lesions girdle the stem, causing the death of the plant. Older plants may show little indication of the disease, although yields may be reduced. The pith may turn brick- red if invaded by the fungus.</p> <ul style="list-style-type: none"> <li>• Mosaic - Mottled dark and light green patterns on leaves; leaves may be distorted; yellow dots may be present on leaves; growth of plant may be reduced.</li> </ul>	<p>or pale green in color.</p> <ul style="list-style-type: none"> <li>• Mexican bean beetle - Irregular patches of feeding damage on underside of leaves which causes the top surface of the leaf to dry out, giving the leaves a lacy appearance; insect will also damage flowers and small pods; pods may be damaged so badly that they drop from the plant; adult insect is an orange-brown beetle with black spots; larvae are fat-bodied grubs which taper at the end and are in rows of conspicuous spines</li> <li>• Stinkbugs (Conspere stinkbug, etc.) - Dark colored pinpricks on fruit surrounded by a lighter area that turns yellow or remains light green; stink bugs often carry pathogens in their mouthparts which can cause secondary infections and decay of fruit; adult insect is shield-shaped and brown or green in color; may have pink, red or yellow markings; eggs are drum shaped and laid in clusters on the leaves; larvae resemble the adults but are smaller.</li> <li>• Spider mites (Two-spotted spider mite) - Leaves stippled with yellow; leaves may appear bronzed;</li> </ul>
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			webbing covering leaves; mites may be visible as tiny moving dots on the webs or underside of leaves, best viewed using a hand lens; usually not spotted until there are visible symptoms on the plant; leaves turn yellow and may drop from plant.
<b>6. Cucumber</b>	<p>Cucumber, (<i>Cucumis sativus</i>), creeping plant of the gourd family (<i>Cucurbitaceae</i>), widely cultivated for its edible fruit. The nutritional value of the cucumber is low, but its delicate flavour makes it popular for salads and relishes. Small fruits are often pickled. The cucumber can be grown in frames or on trellises in greenhouses in cool climates and is cultivated as a field crop and in home gardens in warmer areas.</p>	<ul style="list-style-type: none"> <li>Angular Leaf Spot - Angular leaf spot is one of the most widespread diseases of cucumber. The disease is caused by a bacterium, and the initial symptoms are small, water-soaked spots that develop on the undersides of leaves. These lesions expand until they become limited by the larger secondary veins in the leaf, giving the spots an angular shape. On susceptible cultivars, the spots may be surrounded by a yellow halo. Under humid conditions, a milky ooze exudes from the infected tissues. This ooze dries, leaving a white crust covering the lesions. The disease can also affect stems, petioles, and fruit. Fruit lesions are small (1/10th-inch diam.) and circular with light tan colored centers, and fruit will become deformed if infected when young.</li> <li>Bacterial Wilt - The bacterial wilt pathogen is</li> </ul>	<ul style="list-style-type: none"> <li>Aphids - Although several species of aphids may be found on cucumbers, the melon aphid (also known as the cotton aphid) is the most important as a pest. Melon aphids vary in size and color. Most are approximately 1/16th of an inch long and light yellow to green to black in color. They have black eyes, leg joints, and cornicles ("tailpipes").</li> <li>Cucumber Beetles - Striped, spotted, and banded cucumber beetles can be found on cucumbers, with the banded cucumber beetles found mostly in warm, southern areas. Spotted cucumber beetle adults have yellowish-green wing covers with eleven black spots, a black thorax, head, and yellow abdomen. Adult striped beetles have yellow wing covers with longitudinal black stripes, black head and abdomen. Adult banded beetles have</li> </ul>

		<p>transmitted by the striped and spotted cucumber beetles. The most critical infection period is from seedling emergence to the time when canopies start to close. Wilt symptoms can develop at any time, but the disease is most damaging early in the season when plants are growing rapidly. At first, only a few vines may be affected, but the symptoms can quickly spread to the entire plant. Eventually, vines become necrotic and die. A field diagnostic test for the disease involves cutting a wilted runner near the crown, pressing the cut surfaces together, and slowly pulling the pieces apart. If thin strands of bacterial slime form between the two cut surfaces, then bacterial wilt is probably the cause of the wilting symptoms. The wilt pathogen does not overwinter well in soil or crop debris. The bacterium most likely overwinters on weed hosts and volunteer cucurbit plants.</p> <ul style="list-style-type: none"> <li>• Phytophthora Crown and Root Rot - Phytophthora crown and root rot causes damping-off of young seedlings as well as a rotting of root and crown</li> </ul>	<p>yellowish-green wing covers with three bright green bands or stripes running across the wing covers.</p> <ul style="list-style-type: none"> <li>• Whiteflies - Several species of whiteflies can be found on cucumbers, with the silverleaf and greenhouse whiteflies causing the most damage. Accurate identification is important to avoid treating whitefly species that do not cause significant yield losses. A hand lens is required for identification. Silverleaf whiteflies typically hold their wings vertically tilted, like a pitched roof on a house, and the wings do not meet over the back. By contrast, greenhouse whiteflies hold their wings flatter with no space visible between the wings where they meet over the back.</li> <li>• Thrips - Thrips are small (1/25th-inch long), slender insect with sucking and rasping mouth parts. Species, such as the western flower thrips, feed on plants, which can cause damage and yield reductions if population are high. However, the western flower thrips also eats spider mites, so it can also act as a beneficial insect.</li> </ul>
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tissues. A blighting of the leaves sometimes occurs. Plants develop a sudden and permanent wilt (not recovering overnight), and plant death can occur within a few days of the initial symptoms. A light to dark brown discoloration develops in the roots and lower stems. Affected tissues become soft and water-soaked. Eventually, the root system completely rots. The fungal-like pathogen can also cause a fruit rot, with symptoms developing in the field or after harvest during shipment and storage.

- Powdery Mildew - Powdery mildew appears as a white, powdery growth on the upper and lower leaf surfaces, as well as on petioles and stems. Powdery mildew often develops first on older/lower leaves and on older, fruit bearing plants. Infected leaves prematurely wither and die. Cucumber fruit can also be infected by powdery mildew.

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