

Lettuce

Protected Cropping

Crop group: Lettuce

Crop Rotation

Follow this crop with cucurbits, sweet pepper, tomato, eggplant or sweet corn, broccoli, cauliflower cabbage or pechay. Avoid following with multiple lettuce crops.

Climate & Soil

Lettuce grows best at moderate day temperatures of 15–35°C and thrives best during the cooler season in the lowlands. At higher temperatures, the leafy heads lettuce become loosened and the stem elongated, being accompanied by blooming. In lettuce production, the earlier the crop flowers and the longer the stem becomes, the greater the loss to the farmer.

In the Philippines, the cool temperature requirements of growing lettuce mean that well-ventilated protected cropping structures used for lettuce production is a must in preventing heat build-up.

The crop can be grown on any soil type with a good structure and fertility. Lettuce is often grown on slightly alkaline sandy-loam soils and it does not tolerate acid soils (pH < 6).

Protective Structures

The house-type rain shelter is the most commonly used by farmers in the Philippines, particularly in the Visayas region. The structures can be made from locally sourced bamboo and have a life expectancy of 3-5 years. The structures can be covered in UV-stabilized plastic, which keeps the rain out, or fine netting, which reduces the impact of rain but still allows the rainwater to penetrate, reducing the need for irrigation.

Lettuce trials in Leyte reported an increase of 22% in yield grown under the protective structure compared with open field cultivation by increasing head weight and yield per unit area.



Vigorous green lettuce growing under a protective structure.



Lettuce growing under a net-tunnel protective structure.



Transplanted lettuce seedlings.



Lettuce seedlings ready to plant.

Land preparation

Plow and harrow the area twice a week to break up soil clods, level the area and remove the weeds. Prepare raised beds at about 15–20 cm height in 1m wide and 0.5m apart. Make drainage canals along the sides of the area.

Be sure to water the beds well enough to moisten the soil in preparation for transplanting.

Mulching: Rice hulls, and kakawate leaves can also be used. The mulch should be applied to the top of the bed one week prior to transplanting.

Apply organic mulch about 2.5cm thick on the surface of the soil to minimize evaporation of moisture in the soil and suppress the growth of weeds.

Transplanting

Lettuce seedlings are ready to transplant at about 18 DAS after a week of hardening. It is better to transplant late in the afternoon to minimize seedling shock, particularly on sunny days. Water the seedlings thoroughly before carefully removing them from the seedling trays for transplanting.

With 4 rows per bed, 25cm apart, mark out 20–25cm apart along the rows. Dig planting holes equal to the depth of the seedling tray and gently put seedlings in the hole. Gather the soil around the seedlings and tamp gently to keep them secure and even with the soil surface. After transplanting, water the plants thoroughly without drowning them.

Weed control

- Cultivate the soil before planting to reduce weeds or stale seedbed.
- Practice mulching to control or minimise the growth of weeds.
- During the growth of the crop use a bolo to manually remove weeds
- Spray canals and between beds with contact/ systemic herbicide if necessary.

Harvesting

Harvest lettuce at 30–40 days from transplanting (before bolting) when the head reaches marketable size for the variety. Lettuce should be harvested before they start to bolt. Bolting is when the main shoot inside the head begins to elongate, particularly in leaf lettuce. Overmature lettuce becomes fibrous and develops a bitter taste. For iceberg lettuce, harvest the heads when fully formed and still firm.

Harvesting of lettuce should be done by cutting them away from the stalk with a sharp knife. The outer leaves may be removed if needed or leave the remainder of the plants in the field to allow the nutrients of the plant matter to return to the soil.

Morning is the best time for the harvest as the heads are cool and are firmest.

Fertilizer, irrigation, pest and disease management

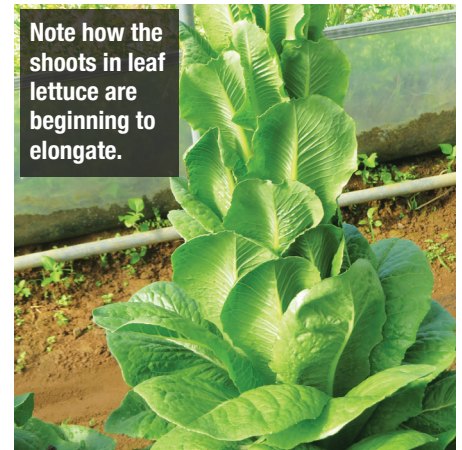
Lettuce growth stages					
	Pre plant	Transplant / Establishment	Vegetative	Head development	Maturity
Fertilizer	<p>Before planting apply fertilizer into each planting hole and mix in with soil. During plant growth, apply fertilizer to each plant an inch away from the base of the plant. Ensure no fertilizer touches the leaf of the plant to avoid leaf burning. Additional application can be applied 2 weeks apart during head development and harvest. Use the following rates per plant.</p>				
Timing	At transplanting	1 week after transplanting	2 weeks after transplanting	3 weeks after transplanting	Additional applications
Rate	100g of registered organic fertilizer plus 10 g (16-16-16 NPK) per hill	75g Calcium nitrate (19% Ca & 15.5% NO3) per 16 liters of water Drench 150mL per hill	150g Calcium nitrate (19% Ca & 15.5% NO3) per 16 liters of water Drench 150mL per hill	225g Calcium nitrate (19% Ca & 15.5% NO3) per 16 liters of water Drench 150mL per hill	
Irrigation	<p>Lay out trickle irrigation drip hose along the beds. Use one hose along each planting row. The spacing of drippers in the hose should be about 25cm or closer. The best strategy is to fully wet the soil profile and encourage rooting.</p>				
	Water immediately after transplanting until soil profile is fully wet and water daily for fast recovery	Water daily (300mL per plant)	Water every 3–4 days for 4–6 hours or until soil is fully wet	Water every 3–4 days for 4–6 hours or until soil is fully wet. Do not under or over water plants.	
Pests	<p>Monitor the crop regularly for pest infestations, look in growing points and on underside of leaves. Approved insecticide should be used as indicated on product labels. Where possible squash eggs and young larvae, prune leaf miner infested leaves and remove caterpillar infested fruit. Bury or bag pruned leaves. Avoid moving from a mite-infested crop into an uninfested crop.</p>				
		Aphids, cutworm, leaf miner	Aphids, cutworm, leaf miner	Aphids, cutworm, leaf miner	Aphids, cutworm, leaf miner
Diseases	<p>Monitor the crop regularly for early disease symptoms. Rogue infected plants showing systemic symptoms and carefully prune away infected parts for localized diseases. If pruning needs to be done, disinfect pruning tools after use on every plant. Bacterial wilt and blight can be transmitted via pruning tools. Preferably carry a container such as a plastic bag for pruned plant materials during pruning and immediately place the pruned diseased or infested plant parts inside the bag to minimize dispersal of inoculum to healthy plants. Approved fungicides should be used as indicated on product labels.</p>				
			Southern blight/rot, soft rot, grey (botrytis)/white (sclerotinia) mould, bacterial leaf spot	Southern blight/rot, soft rot, grey (botrytis)/white (sclerotinia) mould, bacterial leaf spot	Southern blight/rot, soft rot, grey (botrytis)/white (sclerotinia) mould, bacterial leaf spot



Head lettuce at the right stage for harvesting.



To harvest lettuce, cut away from the stalk with a sharp knife.



Bolting in lettuce is an undesirable development and should be prevented.

Postharvest Handling

Once harvested, lettuce is much more susceptible to deterioration than when still attached to the plant. You should do the following with your harvested heads:

1. **Harvest** in the cooler part of the day – early morning or late afternoon.
2. **Place** the harvested head out of the sun – put it in a cool place out of the sun immediately.
3. **Remove** and discard leaves that are damaged, decayed, wilted or infested by insects or other pests. It is also essential to keep lettuce free from contamination by soil or decaying plant material.
4. **Grade** and sort heads according to the correct size for your market.
5. **Pack** the heads immediately and carefully in perforated carton boxes or in plastic crate in a way that will minimize damage to the produce in transit to the market. Storage reduces shelf life and quality.
6. **Deliver** the produce to market as soon as possible after harvesting. There should be a very short delay between harvesting and marketing to consumers.
7. **Monitor** find out how your lettuce arrived at the market and aim to continuously improve the quality of your arriving at the market.

Follow up in the field

The finished crop should immediately be removed and destroyed, and the ground ploughed to prevent pest and disease populations spreading to other crops. This is extremely important!



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