

Lettuce (*Lactuca sativa*) originated in the Mediterranean area of Europe. Records indicate that the Greeks and Romans ate lettuce in salads, cooked or pickled. Among the medicinal uses, the sap from the lettuce plant (a type of latex) is reported to have a mild sedative effect. Explorers like Christopher Columbus and Samuel de Champlain brought lettuce seeds to the new world.

Types of Garden Lettuce

- **Leaf lettuce** plants are characterized by large, loosely packed leaves joined at the stem. Leaf lettuce leaves can range in color from light to dark green to deep burgundy, speckled or a combination of colours (ex. green leaves with burgundy leaf tips). The lettuce leaves can be ruffled or smooth. Leaf lettuce usually has a mild flavor while the texture is usually a bit crisper than butterhead lettuce but not as crisp as Romaine lettuce. Oak leaf lettuce refers to leaf types that have flatter leaves shaped like oak leaves: they can be either red or green in color. Battavia lettuce is also known as summer crisp or French crisp lettuce. Battavia lettuce looks like a loose leaf lettuce when it is young but tends to form a tight bunch as it matures. One of the advantages for home gardeners growing leaf lettuce instead of other types of lettuce is that leaves can be picked individually instead of pulling the whole head from the ground: this allows the leaves to continually replace themselves on the stem throughout the season.
- **Romaine lettuce** is most commonly used for Caesar Salads and is often referred to as Cos lettuce. Romaine lettuce has long, green or red leaves that form an oblong head. Its crisp texture with a stronger flavor than butterhead or leaf lettuce, make it a favorite among food lovers looking for the crispy texture of iceberg lettuce. Romaine lettuce also has a higher nutrient analysis than iceberg lettuce. Although the flavor is strong in Romaine lettuce, it should not be bitter. Previously, romaine lettuce types formed quite large heads at maturity however, newer cultivars can be grown with smaller, individual-sized heads. Some of the newer romaine lettuce cultivars also have a hint of burgundy color in their leaves
- **Butterhead, bibb or Boston lettuce** describes lettuce cultivars that are known for their soft, "buttery"



Butterhead, bibb or Boston lettuce describes lettuce cultivars that are known for their soft, "buttery" textured leaves and sweet, mild flavor

textured leaves and sweet, mild flavor. Although there seems to be some effort to distinguish the three different types based on size, there is no consensus on this issue. The loose forming heads of this lettuce type range in color from light to dark green. In the last several years, grocery stores have started to carry 'living lettuce' or 'hydroponic lettuce'. It is the Butterhead (i.e. Bibb or Boston) lettuce cultivars that are used for these living lettuce sales. 'Living lettuce' is lettuce that has grown in a greenhouse using hydroponics (i.e. plants are grown only in a steady stream of nutrient-rich water). This 'living lettuce' still has the roots attached when purchased in the grocery store in clear plastic containers with a recessed bottom containing water for the lettuce roots. 'Living' Butterhead lettuce will stay fresh in its plastic container for up to one month in the fridge while leaves are removed slowly and carefully throughout the month.

- **Iceberg lettuce** forms a tight, cabbage-like head of pale, green leaves. Iceberg lettuce is known for its fresh, crunchy leaves high in water content. Along with its crisp texture, the iceberg leaf flavor is mild. The growing season for iceberg lettuce is longer than other types. In locations where spring starts later in the season and hot summer temperatures ensue in mid-late June, growing iceberg lettuce in the garden can be a challenge: while the iceberg lettuce is still maturing, the hot summer temperatures cause the plant to bolt or the heads to rot. Growing iceberg lettuce is not recommended for Prairie regions!



Green and red leaf lettuce in a commercial greenhouse.

What is stem lettuce (*Lactuca sativa* var. *augustana*)? Stem lettuce, also called Chinese lettuce or 'Celtuce', is grown for its thick stem (2-3cm in diameter and 15-20cm long) and rosette of leaves at the top. It is widely grown in China and used in Asian cooking. Stem lettuce has a mild flavor that is sometimes described as "nutty cucumber." Stem lettuce is good in salads, but can also be cooked like a vegetable.

✦ Tips for Planting

- Optimal growing conditions for lettuce are cooler temperatures and full sun. Lettuce prefers temperatures between 15-20°C. Air temperatures above 20°C will initiate physiological processes within the plant that will cause the lettuce plant to bolt (i.e. flower) before it produces a significant number of leaves. The warmer the temperature, the faster the bolting will occur.
- Once a lettuce plant has initiated visible flower production, taste becomes more bitter: bolting lettuce is not recommended for eating.
- Although lettuce prefers full sun, if there is a shady area of the garden, lettuce is one of the few vegetables that will grow in light shade.
- Lettuce can be direct seeded into the garden as soon as the soil has thawed. Because most lettuce cultivars mature in 30-60 days, it is possible to plant several crops of lettuce during each growing season. Remember, however, that the hot temperatures of summer are not conducive to successful lettuce production.
- Newly emerged lettuce leaves will survive cool temperatures but will not survive a frost. Lettuce that is planted early in spring and is at risk of experiencing temperatures below 0°C must be protected with crop covers or heavier frost blankets.

Seeding distances between plants and rows for lettuce will be determined by the type of lettuce being grown. Baby leaf lettuce can be sown much closer than romaine lettuce that will be harvested as large heads. Lightly cover seed (only 3mm deep). The following chart provides more details regarding in-row and between-row spacing for lettuce.

Lettuce Type	Spacing between plants within the row	Spacing between rows
Baby leaf/ Romaine	gently shake seeds into a 5-10 cm wide band	Space lettuce 'bands' 30 cm apart on center
Leaf (full size)	15-20 cm	30 cm
Romaine (full size)	30 cm	40-50 cm
Butterhead or Bibb	20-30 cm	30 cm
Iceberg	30 cm	45 cm

Lettuce seed is sometimes available as pelleted seed. This pelleted seed is developed for use in large planting machines that require seeds to be spaced at exact spacing while they are dropped through holes in a planting belt. Pelleted lettuce seed is covered with a clay material. This thin layer of clay around each seed not only makes the seed easier to handle but the clay will attract water and help the lettuce seeds to germinate more quickly and more uniformly. If using pelleted seed in the garden, ensure that the germinating seed remains moist as clay that begins to dry out will wick water away from the germinating seed.



An unknown variety of red romaine lettuce grown at the USask Horticulture Field Facility.



Iceberg lettuce forms a tight, cabbage-like head of pale, green leaves.

■ Irrigation

Water content of lettuce leaves is estimated to be around 95%. Irrigating lettuce plants during the growing season is necessary. Lettuce plants are shallow rooted: never allow the top 8-10cm of the soil to dry out during the growing season. Water lettuce plants with 1.5cm of water, twice per week. A lack of water or uneven watering, especially during hot weather, can lead to bitter tasting leaves. To avoid the spread of diseases, water lettuce early in the day so that the leaves are dry when going into the cooler evening and night hours.

■ Harvest

Depending on the cultivar, lettuce can be ready to harvest from 15 – 70 days after seeding. Romaine and iceberg lettuce should be harvested when a firm head is present in the center of the plant. Harvest leaf lettuce when leaves are a desirable size. Leaf lettuce harvest can be extended by harvesting only several leaves/time: harvest the oldest leaves on the plant, leaving the young, immature leaves to continue to grow. Use a sharp knife to cut the lettuce head or leaves at the base of the plant, just above the soil level. If the goal is to harvest baby leaf lettuce, grow lettuce cultivars that are recommended for baby leaf production. Be prepared to start harvesting baby lettuce about 3 weeks after seeding.

■ Storage

Lettuce needs moisture and air for best storage. Gently wash freshly harvested leaves in cool, clean water. Remove as much water from the lettuce leaves as possible by spinning the leaves in a salad spinner or gently patting the leaves dry with a paper towel. Store the leaves in the fridge crisper inside a perforated container covered with a damp paper towel. Ensure the towel remains damp throughout storage. Freshly harvested lettuce can be successfully stored in the

fridge for 5-7 days. Do not store lettuce in the same compartment as apples, pears or tomatoes as these products release ethylene gas in storage which will cause the lettuce to break down more quickly.



Assorted lettuce types growing in a Saskatoon boulevard garden.

■ Insects and Diseases

Other than cutworms early in the season and slugs and aphid infestations during the growing season, lettuce has few insect problems.

If cutworms or slugs are an issue, place aluminum cans with the bottom and tops removed around each plant. Bury the can at least 3-5 cm deep: this will provide a physical barrier between the pest and the plant.

To control aphids, disrupt the aphid life cycle with a strong (not too strong so that it damages the plants!) jet of water to wash the aphids off the plant: repeat this 'washing' daily for at least two weeks. Insecticidal soap will also kill aphids on contact: follow label directions for safe application.

Two diseases that can be a problem for lettuce at northern regions include tip burn and lettuce drop. As the name suggests, tip burn refers to the tips of the lettuce leaves turning brown and drying up.

Tip burn does not make the lettuce inedible but it is not attractive. Some cultivars are more susceptible to tip burn than others. If tip burn has been a problem, choose cultivars that have been bred for tip burn resistance. Tip burn is more prevalent as the weather becomes hotter and drier: grow cultivars that mature early to avoid hot summer temperatures.

'**Lettuce drop**' reflects the first obvious symptom of this disease: outer, older leaves of the lettuce plant wilt while still attached to the plant. Lettuce drop is especially prevalent on iceberg lettuce growing in warm temperatures. The sclerotinia fungus that causes lettuce drop moves into the center of the head: white mold forms and finally leaf rot. There is nothing that can be done to prevent or cure lettuce drop other than including lettuce in a three year rotation in the garden with other unrelated crops. The sclerotinia fungus is very common in the soil.

Lettuce and E.coli

Over the years, there is usually at least one news report each year regarding lettuce being recalled from grocery stores due to *E. coli* (*Escherichia coli*) contamination. How does lettuce become infected with *E. coli*? *E. coli* occurs normally in the intestines of people and animals. Most strains of *E. coli* are harmless and are necessary for a healthy digestive tract. Occasionally, however, harmful strains of *E. coli* can contaminate food or water. Lettuce requires a lot of irrigation water when it is being grown and sometimes, there can be cross contamination of contaminated water on a farm. The *E. coli* may come from domestic or wild animals defecating in the crop or irrigation water, birds flying overhead or from workers who have not washed their hands properly. It is often difficult to pinpoint the source. Commercial vegetable operations must follow very strict guidelines regarding sanitation, animal movement (even pet dogs and cats are restricted from crop areas) and water quality. Never use uncomposted manure or lagoon water on your own vegetable garden.



"Green Towers" Romaine lettuce grown at the USask Horticulture Field Facility.



Freckles, Breen and Jericho lettuce transplants.



Assorted lettuce transplants in a Saskatoon boulevard garden.

■ Recommended Lettuce Cultivars

Vegetable cultivars are always changing. As soon as a cultivar is recommended, it seems that the following year, the seed is difficult to find. When choosing a lettuce cultivar to grow, pick something that will mature in 75 days or less and try to choose a cultivar that is resistant to tip burn. Lettuce cultivars recommended for baby lettuce may not necessarily do well as full size lettuce as the heads may tend to be large and loose. Baby vegetable varieties are bred for good characteristics at a young age.

Butterhead or Bibb lettuce:

- 'Edox' (red leaf),
- 'Rhapsody Green',
- 'Skyphos' (red leaves with green centers),
- 'Odyssey' (green leaves),
- 'Salanova' (green leaf)

Romaine or Cos lettuce:

- 'Green Forest',
- 'Green Towers',
- 'Jericho' (baby to full size green leaf),
- 'Little Gem Pearl' (small green heads),
- 'Breen' (small heads with red tipped leaves),
- 'Rouge d'hiver' (dark red leaf),
- 'Freckles' (small romaine with red speckled green leaf)

Leaf Lettuce:

- 'Prizehead',
- 'Tango',
- 'Bergam's Green',
- 'New Red Fire' (red leafed),
- 'Scaramanga' (burgundy leaf),
- 'Mottistone' (speckled red and green leaf),
- 'Amish Deer Tongue' (a baby leaf lettuce)

Iceberg Lettuce:

- 'Pacesetter',
- 'Caretaker',
- 'Mighty Joe'