



DONALD DANFORTH
PLANT SCIENCE CENTER

Lettuce Care Protocol

Lactuca sativa

Seed Selection

Not all lettuce varieties are created equal; some are better suited for colder days and other can handle warmer temperatures. Before sowing seed, make sure that the chosen varieties are suited for the current season and selected greenhouse conditions. Growing a mix of varieties in the same conditions may lead to rapid growth in some plants and slow growth in others. This can lead to abiotic stress and increase the likelihood of disease. Make sure that varieties are placed in the greenhouse based on similar growing conditions. There are four primary types of lettuce: Crisphead/Iceberg, Butterhead, Loose-leaf, and Cos/Romaine. Each type has unique optimal environmental conditions.

Type/Cultivar	Temperature
Crisphead/Iceberg	Better in cooler temperatures, prone to bolting early with warming weather
Butterhead	Better in cooler temperatures, becomes bitter with warm temperatures.
Loose-leaf	Most heat tolerant of lettuce types
Cos/Romaine	Better in colder temperatures

Planting Seed

1. Fill a 288-square plug tray with Metro-Mix 360 and place on a white bottom tray.
2. Scatter seed across the top of soil placing 2-5 seeds per cell, then lightly water in.
3. Cover seed with a light amount of Metro-Mix 360. Cover tray with plastic dome.
4. Place domed tray on a non-mist bench in greenhouse G10-A. Use clear RO water daily to mist soil when it is dry.
5. After one week, dome will be removed.
6. Thin lettuce seedlings to one plant per cell.
7. Once first set of true leaves have grown to roughly 1" in length, transplant into final container, e.g. a one gallon pot. Berger BM7 35% Bark is the recommended potting mix for growing lettuce to maturity.
8. Carefully remove seedlings from seed flat using a spatula and gently transplant into final pot that has been filled to 1 inch below the pot's rim with soil.
9. Create PTR tags for each pot, then move pots to final greenhouse location.
10. As the plants grow, the pots will need to be spaced out so that plants aren't touching with a gap of 1" between plants. Airflow is also promoted by setting pots directly on benchtop and not in flood tray. ***This will limit the spread of insects and fungal diseases.***

Watering/Fertilizing

Managing water and fertilizer application is imperative to preventing the development of nutrient deficiencies, salt build up, and disease incursion. Lettuce prefers not to dry out and to maintain a constant moisture level.



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1. One-gallon pots will be top watered, and the plants are checked twice a day for watering needs.
2. The media should be kept moist but not water logged.
3. Current fertilizer regimen is Monday through Friday with Jack's 15-5-15 at an E.C. of 1.0 and a pH of 6.0-6.5. Plants receive clear water on Saturday and Sunday. As the plants begin to grow vigorously, supplemental fertilizer may be needed to achieve higher nutrient demands. Applications of Botanicare Cal/Mg Plus will be applied once plants reach are established, 3-4 weeks after transplanting. See bottle for rate of application.
4. Regular watering will continue until plants begin to senesce or until the researcher has no further need.

Harvesting and Maintenance

Regular thinning of lower leaves is needed to prevent plant material from touching the soil. This prevents the creation of a highly favorable environment for fungal pathogens to develop. Harvest plants when mature, based on type.

1. Clean all tools before and after use with a sanitizing product rated for greenhouse applications (ex. Phytan 20, GreenShield, Zeritol, etc.). Clean all tools in between working with different plants to prevent vectoring diseases between specimens.
2. Using a clean and sharp pair of gardening sheers, cut lower leaves from plant when starting to display signs of senescence.
3. 30 days after transplanting, begin regularly checking for maturity and harvesting any heads that have reached full size. Based on variety.

Pest Management

- The most common insect pest of lettuce observed at Danforth has been fungus gnats. These are easily managed by:
 - o Placing yellow cards out and applying beneficial nematodes weekly.
- The most common and damaging fungal pathogen that has been seen at Danforth in lettuce has been white mold (*Sclerotinia sclerotiorum*). Plants should be harvested before lowest leaves start to senesce, roughly six weeks from transplant (based on variety).
 - o Consider preventative drenches of biocontrol products (e.g. Companion®, Actinovate® SP, etc.)

Typical Growing Conditions:

Temp: 22°C (70°F) / 19°C (65°F) (day/night); prolonged temperatures above 25°C will cause rapid growth and promote onset of nutrient (e.g. calcium) deficiency and predisposition to fungal/pathogen infection.

Relative Humidity: 50% No Higher than 70%

Light: 200 $\mu\text{mol}/\text{m}^2/\text{s}$ (DLI 10-12 $\text{mol}/\text{m}^2/\text{day}$)

Day Length: 14 hours