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Crop Bulletin # 3

Quick Tips

- Use high quality, greenhouse seeds for growing in greenhouses
- Keep proper records
- Follow a strict fertilizer plan to maximize your crops
- Inspect plants regularly for any signs of disease or pests to avoid an outbreak

Growing Greenhouse Lettuce *Getting Started*

Before you begin any agriculture venture, you need to ask yourself the following questions:

1. Do you have a market for your produce?
2. Where will your start up funds come from? And, what type of financial projections can you make for your crops?
3. Where will your inputs come from?



Once you have sorted out all the preliminary questions, you can begin your agriculture business. Working with your local RADA extension officer and other agriculture entities will improve your understanding of crop management, plant nutrition, and business planning.

This bulletin was written to guide you in the process, but by no means does it contain all the information necessary to have a successful greenhouse enterprise. By utilizing all resources available, you will be able to produce a continuous supply of farm-fresh produce for your markets.

Introduction



Lettuce (*Lactuca sativa*) is a temperate annual and it is most often grown as a leaf vegetable. It is the most important salad vegetable grown worldwide today. Lettuce is intensely produced due to high market demand which has increased substantially over the last few years. Lettuce grows best at higher altitudes and/or cooler locations, however, it can grow at lower levels with proper care and environment. In Jamaica, the common variety is a form of iceberg, although many different varieties are grown for both the hotel and restaurant markets.



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SPACING GREENHOUSE LETTUCE

It depends on variety and production system

- In soil planting: use 2 rows per bed (15 in/40 cm between each row and 13 in /33cm between each plant)
- In soilless production, plants are placed 6-7 in/ 15cm apart

Below: Lettuce grown in a soilless production system (hydroponics)



SEED STORAGE

Store seeds in sealed container in the refrigerator. Seeds that are properly stored should remain viable up to one year. The sealed container helps stabilize the relative humidity around the seeds.

Lettuce Varieties

The first step in growing any crop is to choose the best variety for the local market and environmental conditions. This is usually done through basic research (consult your local RADA Office). It is important to select high quality seeds from a reputable seed company. This information is usually found in a seed catalog.

Base variety selection on these criteria:

- Heat resistance/tolerance
- Size and color of lettuce desired
- Disease resistance

Common Lettuce Cultivars

Commonly recognized cultivars in Jamaica:

1. **Butterhead (Boston or Bibb):** this cultivar forms loose heads and has a buttery texture. It is usually heat tolerant.
2. **Crisphead (Iceberg):** this cultivar forms tight and dense heads. This is generally the mildest of the lettuces, valued more for their crunchy texture than flavor.
3. **Loose Leaf:** this cultivar is known for its tender, delicate, and mildly flavoured leaves. This group is comprised of oak leaf and lollo rosso lettuces.
4. **Romaine (Cos):** this cultivar grows in a long head of sturdy leaves with a firm rib.

Seedlings and Transplanting

- Lettuce seeds are very small and make it hard to plant in trays. If you are planting large quantities of seeds, you may want to consider "PELLETIZED" seeds. This means that the seeds are encapsulated with a clay-like substance measuring about 1/8 in diameter;
- Lettuce seeds lose their viability quickly, therefore it is important to use new seeds, or the proper germination may not succeed. "Pelletized" seeds lose their viability quicker;
- Lettuce requires cool temperatures for germination. The seeded trays can be stacked and placed in cooler temperatures (approximately 4.5°C /40.1° F) for 1-2 days;
- Once the seeds germinate and begin to grow, place seed trays on stands in a very cool area;
- Seedlings are generally grown 14-21 days before transplanting, or when they reach a 2-to-3 leaf stage;
- Be careful not to damage plant roots during transplanting as damage predisposes the plant to disease infestation;
- It is better to transplant seedling late afternoon; not only are high temperatures avoided, but the plant can also adjust to its new location in the cooler part of the night.

Nutrient Film Technique (NFT)

- NFT is one of the most popular cultures for growing hydroponic lettuce.
- Special growing channels or gullies may be purchased with 2 in/5cm diameter. PVC pipes cut with holes at 6-7 in/15cm apart will serve as the growing channels.
- NFT is set up to continuously re-circulate a thin layer of nutrient solution past the plant roots providing nutrients and oxygen.
- The floor of the greenhouse is covered with a concrete slab or other barrier to prevent weed growth and to keep it clean.
- The channels are supported on a table about waist height
- Tables with the channels are sloped 2% to allow for drain age of solution
- The piping for irrigation and return lines are above the floor level and attached to the benching system.



Growing lettuce in the NFT style

Soil Production

- Lettuce requires loose soil with good aeration
- Beds can be 4 ft (1.2m) wide with spacing between beds at 1 1/2 ft. (0.3-0.5meters)
- Lay ground cover or plastic mulch to suppress weeds.
- Planting distance between plants is 6-7 inches apart; staggering is not necessary.
- Use 3 drip lines per bed.
- When planting, make sure the drip holes are near the seedling.



Growing lettuce in pots



Growing lettuce in the soil under a protected structure

Crop Nutrients and Fertilizer

It is important to follow a proper nutrient and fertilizer programme to ensure proper crop growth.

The following is a general plan for distribution through a fertigation system. Remember to use high quality, water soluble fertilizers for your greenhouse system.

NOTE: These recommendations assume use of a soilless culture. If you intend to use soil, your pH and water system must be tested before you plan your nutrient application.

PPM	N	K	P	Mg	Ca	S	Fe	Mn	Zn	B	Cu	Mo
Seedling to Harvest	140	96	25	25	150	33	2.5	1.0	.06	.45	0.05	0.05

Note: The pH for lettuce is between 5.5 and 5.8

Nutritional and Environmental Disorders Pest and Disease

Most of the pests that attack other crops will also infest lettuce, thrips, whiteflies, and larvae from moths and butterflies being the most common (See Crop Bulletin #5 Pest and Diseases for more information). One of the worst diseases of lettuce is pythium, and the most common nutritional disorder is tip burn. The latter is caused by excessive water from the leaves accompanied by inadequate water uptake by the roots. Some growers claim that high relative humidity above 70% causes the lettuce to have tip burn. It may also be caused by low calcium levels. Therefore, sufficient oxygen in the nutrient solution is important to maintain healthy roots.

- Check that the EC is not too high;
- Avoid excess temperature fluctuations;
- Try to keep day temperatures under 80° F (26.6° C).

“Bolting” is another problem affecting lettuce. This happens when an elongated stalk with flowers shoots up from the main stem of the plant (lettuce seed stalk). Bolting usually occurs when temperatures are too high. There is nothing that can be done once bolting occurs. However, choosing good seeds that are resistant to high temperatures will help eliminate this problem.

Harvesting Lettuce

- Lettuce can begin to be harvested 45-60 days after transplanting or when the head is compact.
- The entire plant is cut first and the first leaves removed.