



Lettuce Production

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IDEA-NEW



Lettuce Production in the Eastern region

- Lettuce needs for relative cool growing season
- The optimum temperature for germination is from 16 to 20°C and for growth and head formation is 10–18.5°C.
- In the ER can be planted from September-December
- Higher temperatures inhibit heading, promote bitter flavor, and accelerate the development of tip burn and rot.



Types of Lettuce

- Crisphead lettuce
 - the most familiar of the four types
 - characterized by a tight, firm head of crisp, light-green leaves.
 - crisphead lettuce is intolerant of hot weather, readily bolting or sending up a flower stalk under hot summer conditions.
- The butterhead types
 - have smaller, softer heads of loosely folded leaves.
 - Outer leaves may be green or brownish with cream or butter colored inner leaves.



Types of Lettuce

- Leaf lettuce
 - Open growth and does not form a head. Leaf form and color varies considerably.
 - Some cultivars are frilled and crinkled and others deeply lobed. Color ranges from light green to red and bronze.
 - Leaf lettuce matures quickly and is the easiest to grow.
- Romaine or cos lettuces
 - form upright, cylindrical heads of tightly folded leaves.
 - The plants may reach up to 25 inches in height.
 - The outer leaves are medium green with greenish white inner leaves.

Types of Lettuces

Butter
head



Iceberg



Romaine



Leaf



Cultivars

- Mainly crisphead varieties are produced in ER
- Iceberg lettuce varieties
 - Great Lakes, Cisco
- Butter head lettuce
 - Adriana, (green)
 - Red Star, (red)



Lettuce seedlings

- Field nursery
 - 200 g/Jerib
 - Raised bed
 - Rows 20 cm
 - Density not important
 - Use mulch to protect seedlings
 - Fungicide



Field nursery & Lettuce seedling



Plug Lettuce seedlings





Planting Techniques

- Raised beds are recommended for lettuce production
 - 1.5 m bed center to bed center and at least 25 cm high.
 - Four rows per bed
 - Rows are 25 cm in between
 - Plants are 20 – 25 cm separated
- Population density 20,000 - 25,000 plants/jerib.

Lettuce Transplanting



After Transplanting



Field Lay – Out for Lettuce





Manure & Fertilization

- Lettuce field needs for 2-3 MT/jerib FYM
- Before planting apply 30 Kg DAP per jerib
- 50 Kg urea per jerib should be top-dressed – split the amount in two



Irrigation

- The field should be irrigated at the time of sowing/ transplanting
- Every 8-10 days after should be irrigated.
- When heads become full, irrigation should be reduced.
- Drainage is an important
- More moisture may cause rotting.



Weeds

- Weeding should begin, in direct seeded fields, as soon as possible
- Hoe cultivation should be do 2 times
- Hand weeding is important for weed control

Cabbage looper, *Trichoplusia ni*

- Symptoms:
 - Lower leaf damage from feeding;
 - may kill seedlings or slow growth enough to impede uniform maturing of the crop;
 - Older larvae may burrow into the head from top



Cabbage looper, *Trichoplusia ni*

- Control:
 - Natural enemies, limit pesticide treatments, especially between thinning and heading.
 - If necessary use one of the following insecticides:
 - Cypermethrin,
 - Lorsban,
 - DDVP,
 - Malathion



Aphids

- Symptoms:
 - Leaves curled or stunted
 - root damaged
 - general plant stunting.



Aphids

- Control:
 - Wash plants with a soap solution
 - spray with solutions from insecticidal plants: garlic, chili powder, mint, Artemisia
 - If necessary, use
 - Malathion (Malathion 500EC@ 0.5 L/jerib;
 - Malathion 25WP@ 0.68 to 0.86 Kg/jerib)



Damping Off (*Pythium ultimum*)

- Symptoms:
 - Poor emergence
 - collapse and death of seedlings.
- Control:
 - Use raised beds or well drained soils
 - Properly condition greenhouse soils before seeding
 - Use fungicides for seed treatment or soil drenches in the greenhouse: Allet@2 Kg/1000L water, RIDOMIL GOLD 1G@5 Kg/jerib.



Downy Mildew, *Bremia lactucae*

- Symptoms:
 - Yellowish or light-green blotchy areas on the upper sides of leaves
 - white, downy mold then appears on the undersides of the leaf spots
 - the affected areas die.



Downy Mildew, *Bremia lactucae*

- Control:
 - Crop rotation
 - Use resistant cultivars.
 - spray fungicide at 7 to 10 day intervals:
 - ZINEB 80 WP@ 0.34-0.55 Kg/jerib,
 - RIDOMIL GOLD MZ 68 WP@ 0.5 Kg/jerib,
 - Antracol
 - Dithane M-45.



Powdery Mildew, *Erysiphe cichoracearum*

- Symptoms:
 - White powdery growth on both the lower and upper surfaces of the leaves; sometimes producing small black fruiting bodies.



Powdery Mildew, *Erysiphe cichoracearum*

- Control:
 - Destroy crop debris
 - Adjust sowing dates
 - Use fungicides, such as Karathane, Triademefon, Fenaremol, Calixin, Thiovit, Sulfex, or copper oxychloride.



Rhizoctonia Bottom Rot, *Rhizoctonia solani*

- Symptoms:
 - Initially on lower leaves which touch the ground
 - moves into the head causing dark brown, slimy decay.
 - the head may dry out leaving a dry, mummified plant.
 - the pathogen lives indefinitely in the soil.



Rhizoctonia Bottom Rot, *Rhizoctonia solani*

- Control:
 - Avoid rotating susceptible crops (potatoes)
 - Grow lettuce on raised beds.
 - Plow under crop residue after harvest





Harvest and Handling

- Lettuce is harvested when the *heads are well formed and solid*
 - Maturity is based how compact heads are
 - Loose heads are considered immature
 - Mature heads have better flavor and longest storage-life
 - Very firms heads are considered over mature
- Pickers should harvest lettuce a proper maturity for better quality
 - Cut Lettuce near the soil surface
 - Trim unwanted leaves, but leaving 4-5 wrapper leaves
- Harvest early in the morning,
- Wash lettuce to remove soil particles,
- Keep the lettuce cool until marketed



Marketing

- Lettuce is a perishable produce, cannot be stored
- In order to extend the production and marketing season, consecutive plantings have been promoted

Manana

