A guide for handling for cabbage, carrot, hot pepper, lettuce, sweet potato and tomato
1. HARVESTING

Harvesting maturity
Heads should be harvested when firm and before they split or burst. In harvesting for fresh market, leave 4-6 wrapper leaves attached to the

Field assembly
Cabbage is damaged easily if subjected to pressure. They should be packed loosely in field containers, which must not be overfilled or the cabbage will be damaged when the containers are stacked. (See figure 2)

Harvesting method
The entire head is harvested at one time. The head is cut with a sharp knife (See figure 1). Old leaves are removed and discarded.

Fig. 1: Harvesting cabbage with sharp knife

Handling tips
The following care is necessary to keep losses to a minimum:

- They must be packed loosely in well-ventilated plastic field containers
- They must be kept in the shade and not exposed to direct sunlight.
- They must not be exposed to drying winds or they will become wilted and soft
- There must be the shortest possible delay between harvest, storage and sale or consumption.

The harvested cabbage must be kept free from contamination by soil.

Fig. 2: Cabbage packed loosely in crates

Fig. 3: Farm house

Fig. 4: Removal of damaged leaves

2. POST-HARVEST

Selection, grading and handling
Discard all cabbage leaves that are damaged, decayed, wilted or infested by insects or other pests.

Post-harvest treatment
It is essential to keep cabbage free from contamination by soil or decaying plant material.

Shading the produce and keeping it in a moist atmosphere helps to keep it cool, reduces water loss, and delays wilting and yellowing of leaves.
3. PACKAGING
It is important to use containers that can be easily handled by one person. Rough handling of heavy packages results in damage to cabbage. (See figure 5)

Packaging of cabbage may vary in packaging from wholesale to retail.

The following may be used:
- One layer wooden or plastic crates, ventilated cardboard boxes, or perforated polythene bags.

4. STORAGE
Cabbage has a very short post-harvest shelf-life, especially under ambient conditions. Under refrigeration of 0°C (32°F) and 98-100 relative humidity cabbage remain in good condition for up two weeks.

Ideally, cabbage should reach the consumer within two days of harvest.

5. TRANSPORTATION
The appropriate type of transport for cabbage should help maintain the shelf life and value. Water losses by the produce should be restricted to a minimum. Suggested practices:
- Vehicle should not stop under the sun and the produce should be protected with a cover.
- Cover the top boxes with tarpaulin to avoid sun damages and overheating the produce.
- Use refrigerated trucks where possible.

CONCLUSION
Postharvest handling is the final stage in the process of producing high quality fresh produce. Being able to maintain a level of freshness from the field to the table presents many challenges. A grower who can meet these challenges, will be able to expand his or her marketing opportunities and be better able to compete in the marketplace.
1. HARVESTING

Harvesting maturity

Harvest mature hot pepper which will be firm to the touch. Hot Peppers varieties can vary in color from green, yellow, orange-red for fresh use or red for processing.

Field assembly

Hot peppers are put into baskets, apron, or buckets that are then emptied into field boxes or crates for delivery to the pack-house. (See figure 2.) Great care should be taken to avoid mechanical damage during picking and handling.

- They must not be exposed to drying winds or they will become wilted and soft
- There must be the shortest possible delay between harvest, storage, and sale or consumption.

Handling tips

The following care is necessary to keep losses to a minimum:

- Harvested peppers should be placed in the shade immediately after harvest and cooled, if refrigeration is available, to lower the field-heat.
- Avoid harvesting of wet peppers.

Fig. 1: Harvesting hot peppers

2. POST-HARVEST

Selection, grading and handling

Pre-grading at the field to remove damaged peppers, leaves and other foreign material.

Post-harvest treatment

Before final packing for market peppers should be selected for uniform maturity, color, shape, size and for freedom from defects (sunscald, mechanical or insect damage or decay). (See figure 5.)

Fig. 3: Farmhouse provide shade and cool environment to maintain freshness and quality during grading sorting and temporary storage before delivery to market

Fig. 4: Field grading of hot pepper

Fig. 5: Grading peppers at packinghouse
3. PACKAGING

The following may be used: plastic crates or ventilated cardboard boxes, (See figure 6.)

Hot peppers should not be packed in plastic bags as this will lead to fruit breakdown and decay

4. STORAGE

Hot Peppers should be cooled as soon as possible after harvesting to 8-10 °C and 90-95% Relative Humidity.

At higher temperatures they will show signs of shriveling, shrinkage, softening, accelerates ripening and color changes.

Peppers are sensitive to ethylene gas and should not be stored or shipped with produce such as tomatoes, apples, bananas and avocados.

5. TRANSPORTATION

The appropriate type of transport for hot peppers should help maintain the shelf life and value. Water losses by the produce should be restricted to a minimum. Suggested practices:

- Vehicle should not stop under the sun and the produce should be protected with a cover.
- Cover the top boxes with tarpaulin to avoid sun damages and overheating the produce.
- Use refrigerated trucks where possible.

CONCLUSION

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A Guide for Handling Hot Pepper (Capsicum Sp.)

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1. HARVESTING

**Harvesting maturity**
Harvest lettuce in the immature state, before the point of seed production. Over mature lettuce becomes fibrous or woody and develops a bitter taste.

**Harvesting method**
The entire head is harvested at one time. The head is cut with a sharp knife or clipper (See figure 1). Old leaves are removed and discarded.

**Field assembly**
Lettuce is damaged easily if subjected to pressure. They should be packed loosely in field containers, which must not be overfilled or the lettuce will be damaged when the containers are stacked. (See figure 2)

The harvested lettuce must be kept free from contamination by soil.

**Handling tips**
The following care is necessary to keep losses to a minimum:
- They must be packed loosely in well-ventilated plastic field containers
- They must be kept in the shade and not exposed to direct sunlight.
- They must not be exposed to drying winds or they will become wilted and soft
- There must be the shortest possible delay between harvest, storage and sale or consumption.

Fig. 2: Lettuce packed loosely in crates
Fig. 3: Farm house

2. POST-HARVEST

**Selection, grading and handling**
Discard all lettuce leaves that are damaged, decayed, wilted or infested by insects or other pests.

**Post-harvest treatment**
It is essential to keep lettuce free from contamination by soil or decaying plant material.

Shading the produce and keeping it in a moist atmosphere helps to keep it cool, reduces water loss, and delays wilting and yellowing of leaves.
3. PACKAGING
It is important to use containers that can be easily handled by one person. Rough handling of heavy packages results in damage to lettuce.

Packaging of lettuce may vary in packaging from wholesale to retail.

The following may be used:
One layer wooden or plastic crates, ventilated cardboard boxes, or perforated polythene bags (See figure 5)

4. STORAGE
Lettuce has a very short post-harvest shelf-life, especially under ambient conditions. Under refrigeration of 0°C (32°F) and 98-100 relative humidity lettuce remain in good condition for up two weeks.

Ideally, lettuce should reach the consumer within two days of harvest.

5. TRANSPORTATION
The appropriate type of transport for lettuce should help maintain the shelf life and value. Water losses by the produce should be restricted to a minimum. Suggested practices:

- Vehicle should not stop under the sun and the produce should be protected with a cover.

- Cover the top boxes with tarpaulin to avoid sun damages and overheating the produce.

- Use refrigerated trucks where possible.

CONCLUSION
Postharvest handling is the final stage in the process of producing high quality fresh produce. Being able to maintain a level of freshness from the field to the table presents many challenges. A grower who can meet these challenges, will be able to expand his or her marketing opportunities and be better able to compete in the marketplace.

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A Guide for Handling Lettuce
(Lactuca sativa L.)
1. HARVESTING

Harvesting maturity
Sweet potatoes are considered ready for harvest when the leaves begin to yellow.

A further test of readiness to harvest is that the cut surface of mature tubers do not discolor.

Field assembly
Great care must be taken to avoid damage to the skin of sweet potato roots since they can be easily damaged and eventually decay. (See figure 2)

They must be kept in the shade and not exposed to direct sunlight.

There must be the shortest possible delay between harvest, storage, and sale or consumption.

Fig. 2: Sweet potato field assembly

Handling tips
The following care is necessary to keep losses to a minimum:

- The roots should not be thrown, whether into field and storage containers or at any other time during their handling.

Fig. 1: Harvesting sweet potato with fork

2. POST-HARVEST

Selection, grading and handling
Discard damaged and decayed tubers. Tubers which are to be stored should be fully mature and free from visible injury.

Fig. 4: Defective potato

Post-harvest treatment
Curing is a process of healing by the formation of new skin on damaged areas of sweet potatoes, and also of the maturing and hardening of the whole skin of the roots.

To get proper curing, tubers should be stored at of 27 to 34°C and 85-90% Relative Humidity for time of 15 to 20 days.

Successful curing is achieved when the skin of the sweet potato can no longer be rubbed off easily from the tuber and when small buds appear on the roots.

Farmhouse provide shade and cool environment to maintain freshness and quality during grading sorting and temporary storage for delivery to market.
3. PACKAGING

Roots should be packed firmly to prevent movement within the boxes or crates during handling and transport. The following may be used: wooden crates, plastic crates or ventilated cardboard boxes, (See figure 5)

![Image of packed roots]

Fig. 6: Sweet potatoes in cool storage

Sweet potatoes should not be packed in 50 kg (110 lbs) sacks, which are difficult to handle and can cause damage

4. STORAGE

Recommended storage condition are:

- The roots must be fully mature and well cured before storage;
- They must be handled carefully at all times and only sound roots should be stored;
- Temperature range of 10 to 15°C (50-60 °F) and Relative Humidity of 85 to 90%.

5. TRANSPORTATION

The appropriate type of transport for sweet potatoes should help maintain the shelf life and value. Water losses by the produce should be restricted to a minimum. Suggested practices:

- Vehicle should not stop under the sun and the produce should be protected with a cover.
- Cover the top boxes with tarpaulin to avoid sun damages and overheating the produce.
- Use refrigerated trucks where possible.

![Image of transport vehicles]

Fig. 7: Covered truck

Fig. 8: Refrigerated truck

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Postharvest handling is the final stage in the process of producing high quality fresh produce. Being able to maintain a level of freshness from the field to the table presents many challenges. A grower who can meet these challenges, will be able to expand his or her marketing opportunities and be better able to compete in the marketplace.

A Guide for Handling Sweet Potato

(Ipomoea batatas)

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1. HARVESTING

**Harvesting maturity**

Tomatoes are harvested at the early ripening or pink stage. (See figure 1.)

![Fig. 1: Early ripening](image)

*(Immature tomatoes do not ripen after harvest)*

**Harvesting method**

Tomato fruit stalks have a natural break-point. Mature fruit readily breaks away from the cluster when pressure is placed on this point while lifting the fruit upwards.

![Fig. 2: Harvesting tomato](image)

**Field assembly**

Tomatoes are best harvested into plastic buckets (pails) and transferred if necessary to plastic field crates holding not more than 20 to 25 kg (40 to 45 lbs) weight. (See figure 3)

![Fig. 3: Tomato field assembly](image)

**Field crate should not be filled to stacking height.**

**Handling tips**

The following care is necessary to keep losses to a minimum:

- They must be packed loosely in well-ventilated plastic field containers
- They must be kept in the shade and not exposed to direct sunlight.

![Fig. 4: Farm house](image)

- They must not be exposed to drying winds or they will become wilted and soft
- There must be the shortest possible delay between harvest, storage and sale or consumption.

2. POST-HARVEST

**Selection, grading and handling**

Discard decaying, damaged, undersized and sunburned tomatoes.

![Fig. 5: Defective tomatoes](image)

**Post-harvest treatment**

It is essential to keep tomatoes free from contamination by soil or decaying plant material.

Shading the produce and keeping it in a moist atmosphere helps to keep it cool and reduces water loss.
3. PACKAGING

It is important to use containers that can be easily handled by one person. Rough handling of heavy packages results in damage to tomatoes. Type packaging for tomatoes may vary in from wholesale to retail.

The following may be used:

One layer wooden plastic crates, ventilated cardboard boxes, or in perforated polythene bags (See figure 6)

4. STORAGE

Tomatoes have a relatively poor storage capability. Green mature fruit can (65-70 °F) be held for up to two weeks at 18-20° C and 90-95% Relative Humidity.

Fully ripe tomatoes have only 4 to 7 days' storage life, at 13-15° C (55-60 °F) and 90-95% Relative Humidity.

5. TRANSPORTATION

The appropriate type of transport for tomatoes should help maintain the shelf life and value. Water losses by the produce should be restricted to a minimum. Suggested practices:

- Vehicle should not stop under the sun and the produce should be protected with a cover.
- Cover the top boxes with tarpaulin to avoid sun damages and overheating the produce.
- Use refrigerated trucks where possible.

CONCLUSION

Postharvest handling is the final stage in the process of producing high quality fresh produce. Being able to maintain a level of freshness from the field to the table presents many challenges. A grower who can meet these challenges, will be able to expand his or her marketing opportunities and be better able to compete in the marketplace.

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A Guide for Handling Tomato
(Lycopersicon esculentum)