

**Ministry of Education**  
**Curriculum Planning and Development Division**

**Level: Forms 4 & 5**

***CVQ Level 1 – Crop Production - Grow Box Operations***

Unit Code	Unit Title	Mandatory/ Elective
AG00657	Plant Seedlings in Grow Box	Mandatory

**Unit Descriptor:**

**This unit deals with the skills and knowledge required for preparing a Grow Box for planting. It describes the work expectations associated with preparing the growing medium and filling the grow box with the prepared growing medium.**

<b>ELEMENTS</b> <i>Candidates must be able to:</i>	<b>PERFORMANCE CRITERIA</b>
1 Transplant seedlings in grow box	1.1 Wear suitable personal protective equipment when planting seedlings
	1.2 Select appropriate tools and accessories for transplanting seedlings in the grow box
	1.3 Measure and line planting distance according to the number of seedlings to be grown
	1.4 Select healthy seedlings for transplanting following supervisor's instructions

<b>ELEMENTS</b> <i>Candidates must be able to:</i>	<b>PERFORMANCE CRITERIA</b>
1 Transplant seedlings in grow box	1.5 Handle seedlings with care in accordance with industry procedures
	1.6 Plant seedlings in the prepared growing medium as instructed by the supervisor
	1.7 Store extra seedlings in accordance to organizational procedures

The background features abstract, overlapping green geometric shapes, primarily triangles and polygons, in various shades of green, creating a modern and dynamic visual effect.

Transplant  
seedlings in grow  
box

# Personal Protective Equipment (PPE)

- ▶ Coveralls
- ▶ Steel-tip boots
- ▶ Gloves
- ▶ Helmet
- ▶ Goggles
- ▶ Hat



Source: <https://www.omrindustryjournal.com/personal-protective-equipment-ppe>

## Materials

- Well-hardened seedlings
- A prepared grow box

## Equipment

- watering can
- hose
- hand trowel
- dibber
- measuring tape
- chalk

## Chemicals

- Nutrex

# What crops are suitable for a Grow box

- ▶ Short term crops which are shallow-rooted, will be best suited for planting in a grow box that is one concrete block in height (8 inches or 20 cm ).
- ▶ Construct a deeper box by stacking the blocks on top of each other if deep-rooted crops are to be planted

# Spacing requirements are required for planting crops



IN ROW  
SPACING

BETWEEN ROW  
SPACING

Source <https://thegrowbox.blogspot.com/search/label/Transplanting%20Seedlings%20in%20the%20Grow%20Box>

- ▶ When planting seedlings in a grow box, spacing is important. Spacing applies to both the distance between plants in a row and the distance between rows of plants.



# Importance of adequate plant spacing

- ▶ Adequate spacing is important if the desired outcome is the faster, vigorous, and healthy growth of plants.
- ▶ Overcrowding can slow plant growth.
- ▶ The root system of plants will have sufficient room to grow and spread freely in the soil.
- ▶ The roots of each plant will have sufficient access to adequate moisture and nutrients.

# Importance of adequate plant spacing

- ▶ The leaf canopy of the crop will have sufficient room to spread.
- ▶ Wind passage will be enhanced which in turn increases gaseous exchanges and prevents excessive humidity.
- ▶ There will be reduced competition for light favouring more efficient photosynthesis.
- ▶ It allows for close inspection of individual plants and faster detection of pests, diseases, and nutritional deficiencies.

# Importance of adequate plant spacing

- ▶ The table below indicates the planting distances that are best suited for some of the crops that may be planted in a grow box

CROP	DISTANCE IN ROWS (Cm)	DISTANCE BETWEEN ROWS (Cm)
Pac choi	80-90	50-60
Lettuce	25-30	20-25
Green Beans	75	20-30
Hot peppers	100-120	100-120
Ochro	80-90	50-60
Beet Root	20-25	10-15
Tomato	50-60	30-40

# Why is it necessary to plant crops in rows

- ▶ Allow for easier weed control
- ▶ Allow for easier pest control and pest identification
- ▶ Allows for easier molding
- ▶ Allows for easier staking and trellis formation



Source <https://thegrowbox.blogspot.com/search/label/Transplanting%20Seedlings%20in%20the%20Grow%20Box>



# Why is it necessary to plant crops in rows

- ▶ Allows for a neater and more aesthetically pleasing garden
- ▶ Allows for proper spacing of crops
- ▶ Allows for easier harvesting
- ▶ Allows for a more efficient use of space for planting



Source <https://thegrowbox.blogspot.com/search/label/Transplanting%20Seedlings%20in%20the%20Grow%20Box>

# Measuring and lining planting distances according to the number of seedlings to be grown



Source [https://Growbox\\_System\\_Vegetables\\_Manual.pdf](https://Growbox_System_Vegetables_Manual.pdf)

- ▶ For a standard sized grow box (90cm x 300cm) and using lettuce as the crop, use a measuring tape and chalk and mark out 20 cm intervals (between row) along the width of the grow box
- ▶ Follow the same procedure along the length of the grow box, marking out 25 cm intervals (In row)
- ▶ Markings can be made on a broom stick and this can then be used to make the markings of the planting holes easier



# Selecting healthy seedlings for transplanting

- ▶ Starting a grow box with healthy seedlings will ensure that the crops produced will be of the best quality.
- ▶ The seedlings that are to be transplanted into the grow box should have the following characteristics:
  - ▶ Healthy leaves that are glossy and green.
  - ▶ Healthy roots. The roots of healthy seedlings should be white and plentiful.
  - ▶ Free from pests and diseases.
  - ▶ The seedlings of crops like tomatoes, melongene and peppers should have straight thick stems. Seedlings that are spindly and tall will get broken by the wind

# Transporting seedlings to the Grow box



**Correct Posture**



**Incorrect Posture**

Source: <https://gardenever.com/wheelbarrow-handling-tips-handle-wheelbarrow-best-way/>

- ▶ When transporting the seedlings using a wheelbarrow, ensure that seedling trays are not stacked onto each other which can damage the seedlings. Also, ensure the wheelbarrow is not overfilled and become too heavy and proper lifting posture is maintained while using the wheelbarrow.



# Handle seedlings with care



- ▶ Gently remove seedlings from the seedling tray using a dibber.
- ▶ Do not grasp seedlings by the leaves as this may cause damage to the seedlings.

# Plant seedlings in the prepared growing medium



Source <https://thegrowbox.blogspot.com/search/label/Transplanting%20Seedlings%20in%20the%20Grow%20Box>

- ▶ Place seedling upright in the hole.
- ▶ Cover base of seedling with planting medium, pressing gently around the root. (Please note, gloves should be worn at all times)
- ▶ Water seedlings thoroughly with nutrex solution (mixed according to manufacturer's specifications) for soil root contact.

# Storing extra seedlings



Source: [23rf.com/photo\\_87650248\\_worker-watering-plant-seedling-in-greenhouse-.html](https://23rf.com/photo_87650248_worker-watering-plant-seedling-in-greenhouse-.html)

- ▶ Return extra seedlings to the greenhouse
- ▶ Water seedlings if the moisture content in the seedling tray is low
- ▶ Ensure the seedlings are kept off the ground and under shade



# EVALUATION

1. What crops are suitable for growing in a grow box?
2. What spacing requirements are required for planting the following crops in a grow box:

CROP	DISTANCE IN ROWS (Cm)	DISTANCE BETWEEN ROWS (Cm)
Pac choi		
Lettuce		
Green Beans		
Hot peppers		
Ochro		
Beet Root		
Tomato		

# EVALUATION

3. Why is it necessary to plant crops in rows?
4. How do you select healthy seedlings?
5. How do you handle seedlings when transplanting into the grow box?
6. How do you transplant seedlings?

# ANSWERS

1. What crops are suitable for growing in a grow box?
  - Short term crops which are shallow-rooted, will be best suited for planting in a grow box that is one concrete block in height (8 inches or 20 cm ).
  - Construct a deeper box by stacking the blocks on top of each other if deep-rooted crops are to be planted

# ANSWERS

2. What spacing requirements are required for planting the following crops in a grow box:

CROP	DISTANCE IN ROWS (Cm)	DISTANCE BETWEEN ROWS (Cm)
Pac choi	80-90	50-60
Lettuce	25-30	20-25
Green Beans	75	20-30
Hot peppers	100-120	100-120
Ochro	80-90	50-60
Beet Root	20-25	10-15
Tomato	50-60	30-40

# ANSWERS

3. Why is it necessary to plant crops in rows?

- Allow for easier weed control
- Allow for easier pest control and pest identification
- Allows for easier molding
- Allows for easier staking and trellis formation
- Allows for a neater and more aesthetically pleasing garden
- Allows for proper spacing of crops
- Allows for easier harvesting
- Allows for a more efficient use of space for planting



# ANSWERS

## 4. How do you select healthy seedlings?

The seedlings that are to be transplanted into the grow box should have the following characteristics:

- Healthy leaves that are glossy and green.
- Healthy roots. The roots of healthy seedlings should be white and plentiful.
- Free from pests and diseases.
- The seedlings of crops like tomatoes, melongene and peppers should have straight thick stems. Seedlings that are spindly and tall will get broken by the wind

# ANSWERS

5. How do you handle seedlings when transplanting into the grow box?

- Gently remove seedlings from the seedling tray using a dibber.
- Do not grasp seedlings by the leaves as this may cause damage to the seedlings.
- Always handle seedlings with care.

# ANSWERS

## 6. How do you transplant seedlings?

- Place seedling upright in the hole.
- Cover base of seedling with planting medium, pressing gently around the root. (Please note, gloves should be worn at all times)
- Water seedlings thoroughly with nutrex solution (mixed according to manufacturer's specifications) for soil root contact.

# References

- ▶ The Grow Box

- ▶ Retrieved from : <https://thegrowbox.blogspot.com/>