

**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
AG00655	Prepare Site and Construct Grow Box	Mandatory

Unit Descriptor:

This unit deals with the skills and knowledge required for preparing the site and constructing a Grow Box. It describes the work expectations associated with clearing and levelling the site for the Grow box and the measuring and construction of the Grow Box frame.

ELEMENTS <i>Candidates must be able to:</i>	PERFORMANCE CRITERIA
1 Prepare site for grow box	1.1 Wear suitable personal protective equipment while preparing the site and constructing a grow box
	1.2 Select appropriate tools for preparing the site and constructing the grow box
	1.3 Identify a suitable location for the grow box following supervisor's specifications
	1.4 Clean the site following supervisor's instructions
	1.5 Level the site according to supervisor's instructions
2 Construct grow box	2.1 Select suitable materials for the construction of the grow box according to supervisor's instructions
	2.2 Measure and mark the area required for the grow box following the supervisor's specifications
	2.3 Construct the grow box frame using the selected materials following supervisor's instructions
	1.4 Clean the site following supervisor's instructions
	2.4 Clear and prepare the pathways between the grow box frames according to the supervisor's instructions

Personal Protective Equipment (PPE)

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



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

Materials

- Concrete blocks
- Plastering sand
- Cement
- Sharp sand
- Gravel
- Construction Plastic
- Composted material
- Wooden or metal stakes
- Line

Equipment

- Hoe
- Shovel
- Bucket
- Trowel
- Wheelbarrow
- Rake
- Level
- T-Square

How to identify a suitable location for constructing a Grow Box

- Topography
- Drainage
- Available sunlight
- Accessibility
- Security

TOPOGRAPHY

- ▶ FLAT AREA
- ▶ The area should be flat.
- ▶ If the base is not level, water and fertilizers added will drain to one side and cause uneven growth or no growth

DRAINAGE

- ▶ The area should be free draining.
- ▶ All excess water must drain away freely after the box has been watered and quickly after rainfall.

AVAILABLE SUNLIGHT

▶ SHADE

- ▶ Avoid shaded areas
- ▶ Place in open areas
- ▶ At least six hours of continuous sunlight

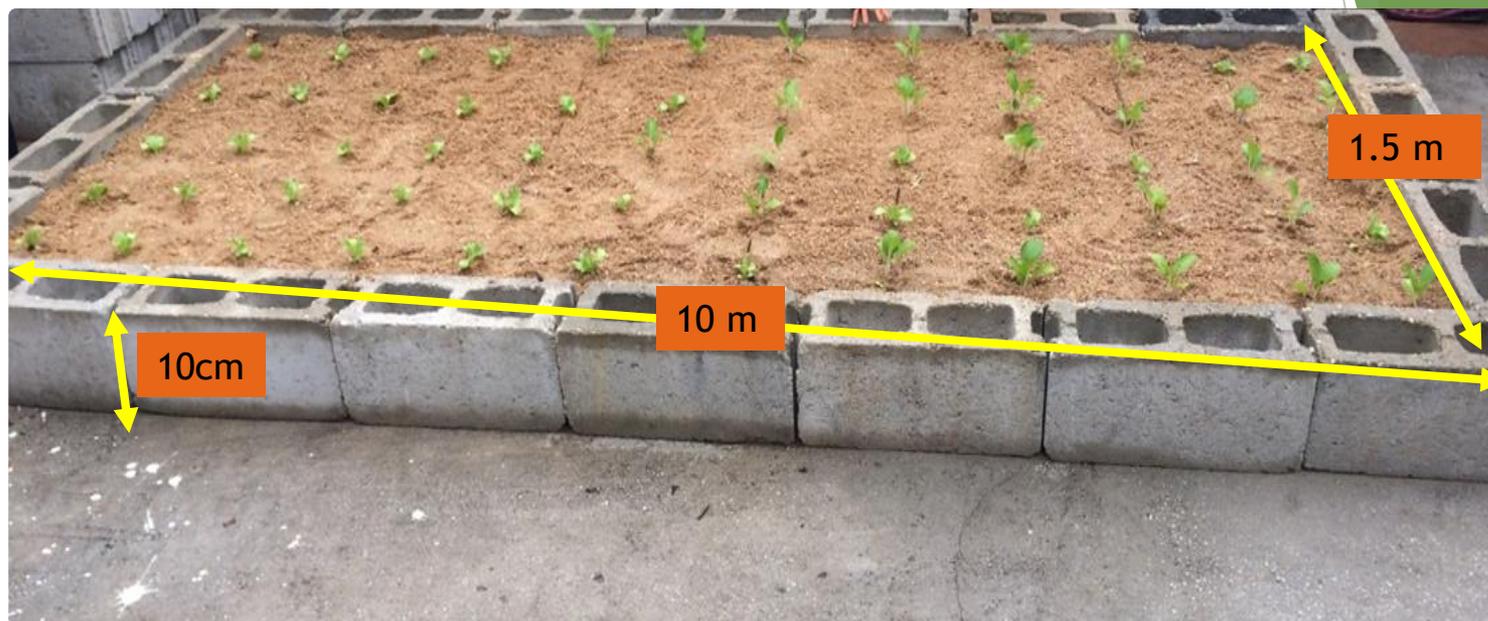
ACCESSIBILITY

- ▶ Place where you have ready access to it at all times
- ▶ Easily bring in your construction materials, fertilizers, water
- ▶ Get your crops out easily.

SECURITY

- ▶ Secure from theft as well as household pets (dogs, cats) and poultry (fowls, ducks).

Dimensions of a grow box



- ▶ A standard size grow-box is 10m long x 1.5m wide x 10cm deep.
 - ▶ But can also be constructed in half the size suggested above
 - ▶ One quarter
 - ▶ One third
 - ▶ Twice the size
- ▶ The depth allows for sufficient root room for short term vegetable crops
- ▶ The width allows an average person to work without having to step inside the grow box.

What are the advantages of using the Grow Box method?

- ▶ Can be constructed in areas where there is no soil for crop production
- ▶ Can be constructed in areas where there is poor soil for crop production
- ▶ Limited space requirement- high density.
- ▶ Simple technology
- ▶ Boxes can be situated close to the home
- ▶ Easy to manage
- ▶ Does not require a lot of labour
- ▶ Minimal weeds
- ▶ Minimum pests and diseases
- ▶ Less use of harmful pesticides
- ▶ Income supplementation

Preparing the site for a grow box

Site Preparation- Cleaning the site



Source: <https://thegrowbox.blogspot.com/2014/12/selecting-site-for-grow-box.html>

- ▶ Using a garden hoe, a garden rake, and any other garden tools, clean the site by removing all weeds, crop residues, stones and pebbles

Site Preparation- Levelling the site



Source: <https://thegrowbox.blogspot.com/2014/12/selecting-site-for-grow-box.html>

- ▶ Using rakes and hoes, break up all the large clumps of soil
- ▶ Level the area using sharp sand or plastering sand

Site Preparation- A Levelled site



Source: <https://thegrowbox.blogspot.com/2014/12/selecting-site-for-grow-box.html>

Constructing the grow box

Measuring and marking the area

- ▶ Measure and mark out the area where the concrete blocks will be placed and where pathways will be located by using the measuring tape, stakes, square and lines (string/twine),
- ▶ Mark out pathways if constructing more than one grow box in the same area
 - ▶ The pathway should be wide enough to allow a wheelbarrow to pass (approximately 60cm wide)
- ▶ Concrete blocks should be placed outside of the marker lines in order to get the correct size inside the grow box



Establishing a marker using a metal stake



Area for grow box marked by stakes and lines

Constructing the grow box frame



- ▶ Line the base of the grow box with construction plastic
- ▶ The plastic sheeting should be cut a few inches larger than the size of the grow box so that it extends beyond the external "walls" of the grow box.

Constructing the grow box frame



- ▶ Place concrete blocks close together
- ▶ Use the line to guide the placement of the blocks
- ▶ Use the level to ensure blocks are level
- ▶ If blocks appear uneven, some sharp sand can be used at the base to level the blocks.

Constructing the grow box frame

- ▶ Ensure the corners of the grow box are at right angles by using a T-square
- ▶ The "one in one out" pattern can be used to control the size of the grow box.
- ▶ It also helps to "tie-in" the corners of the grow box and make the blocks more secure.



Using a square to ensure corners are aligned



The "one in one out" pattern of block placement

The completed Grow Boxes and pathways



EVALUATION

1. How to identify a suitable location for constructing a grow box?
2. Why is it important to level the surface in preparing the site for grow box construction?
3. What materials and tools are required for constructing a grow box?
4. Why is it necessary to mark and measure the area for grow box construction?
5. What is the significance of the dimensions of a grow box?
6. What are the advantages of using the grow box method?
7. Outline the steps required to:
 - a) Prepare a site for constructing a Grow Box
 - b) Construct a Grow Box

ANSWERS

1. How to identify a suitable location for constructing a grow box?

SHADE: Avoid shaded areas, place in open areas ,at least six hours of continuous sunlight

FLAT AREA: The area should be flat, bare ground, concrete or asphalt.

SECURITY: Secure from theft as well as household pets (dogs, cats) and poultry (fowls, ducks).

DRAINAGE: The area should be free draining.

ACCESSIBILITY Place where you have ready access to it at all times, easily bring in your construction materials, fertilizers, water and get your crops out easily.

ANSWERS

2. Why is it important to level the surface in preparing the site for grow box construction ?

If the base is not level, water and fertilizers added will drain to one side and cause uneven growth or poor growth or no growth of crops

ANSWERS

3. What materials and tools are required for constructing a grow box?

Materials	Tools:
<ul style="list-style-type: none">• Concrete blocks• Plastering sand• Cement• Sharp sand• Construction Plastic• Composted material• Wooden or metal stakes• Line	<ul style="list-style-type: none">• Hoe• Shovel• Bucket• Trowel• Wheelbarrow• Rake• Level• Square

ANSWERS

4. Why is it necessary to mark and measure the area for grow box construction?

Marking and measuring the area allows for a neat, accurate and ideally located grow box. It ensures that the correct dimensions are used and the grow box is level and pathways are the correct size.

ANSWERS

5. What is the significance of the dimensions of a grow box ?

- A standard size grow-box is 10m long x 1.5m wide x 10cm deep.
- Grow boxes can be constructed in half the size suggested above, one quarter, one third or twice the size.
- The depth allows for sufficient root room for short term vegetable crops
- The width allows an average person to work without having to step inside the grow box.
- If constructing more than one grow box in the same area, the pathway should be wide enough to allow a wheelbarrow to pass (approximately 60cm wide)

ANSWERS

6. What are the advantages of using the grow box method ?

- Can be constructed in areas where there is no soil for crop production
- Can be constructed in areas where there is poor soil for crop production
- Limited space requirement- high density.
- Simple technology
- Boxes can be situated close to the home
- Easy to manage
- Does not require a lot of labour
- Minimal weeds
- Minimum pests and diseases
- Less use of harmful pesticides
- Income supplementation

ANSWERS

1. 7. Outline the steps required to:

a) Prepare a site for constructing a Grow Box

Site Preparation- Cleaning the site

Using a garden hoe, a garden rake, and any other garden tools, clean the site by removing all weeds, crop residues, stones and pebbles

Site Preparation- Levelling the site

Using rakes and hoes, break up all the large clumps of soil

Level the area using sharp sand or plastering sand

ANSWERS

1. 7. Outline the steps required to:

b) Construct a Grow Box

Measuring and marking the area

Measure and mark out the area where the concrete blocks will be placed and where pathways will be located by using the measuring tape, stakes, square and lines (string/twine),

Mark out pathways if constructing more than one grow box in the same area,

The pathway should be wide enough to allow a wheelbarrow to pass (approximately 60cm wide)

Concrete blocks should be placed outside of the marker lines in order to get the correct size inside the grow box

Constructing the grow box frame

Line the base of the grow box with construction plastic

The plastic sheeting should be cut a few inches larger than the size of the grow box so that it extends beyond the external "walls" of the grow box.

Constructing the grow box frame

Place concrete blocks close together

Use the line to guide the placement of the blocks

Use the level to ensure blocks are level

If blocks appear uneven, some sharp sand can be used at the base to level the blocks.

Constructing the grow box frame

Ensure the corners of the grow box are at right angles by using a T-square

The "one in one out" pattern can be used to control the size of the grow box.

It also helps to "tie-in" the corners of the grow box and make the blocks more secure.

References

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