



# **Micro-Garden Technical Working Group**

## **Food Security Sector**

**14<sup>th</sup> September, 2016**

***Venue: Markaziah Hotel***

# Presentations



1. FAO presentation on findings of Micro Garden pilot project
2. Seasonal Calendar
3. Organic pest control remedies



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# Improving the Nutrition of Syrian Refugees and Host Communities Through Garden Walls

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*Antoun Maacaroun*

[Antoun.Maacaroun@fao.org](mailto:Antoun.Maacaroun@fao.org)

*FAO - National Agricultural Consultant*



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## Link to Final Report:

<http://data.unhcr.org/syrianrefugees/admin/download.php?id=11801>

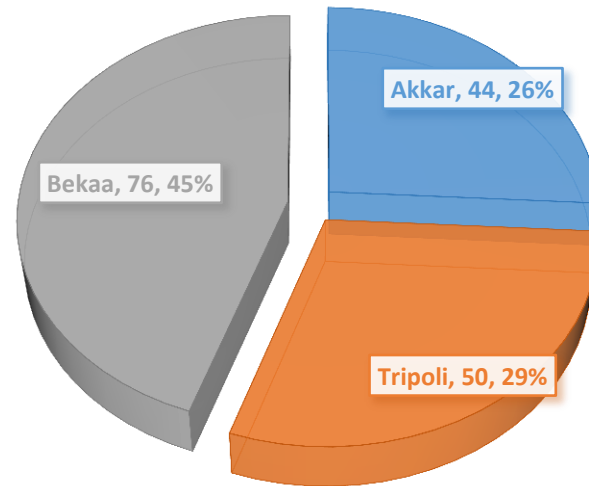


## Objectives:

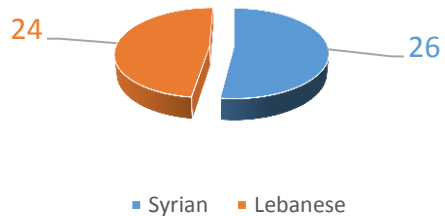
- To cope with the stressful situation through gardening
- To improve social relations between people sharing green units and learning from each other
- To innovate and adapt the production units to camp conditions
- To partially subsidize the diet of the refugees and the hosting communities.



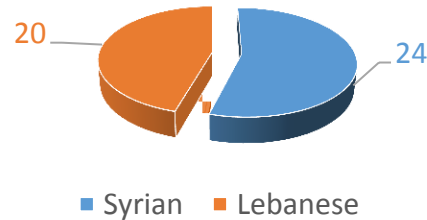
## Beneficiaries distribution



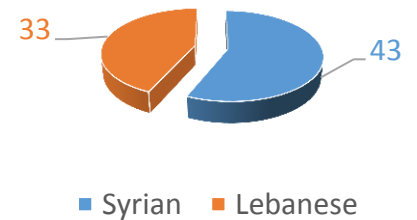
Beneficiaries Tripoli



Beneficiaries in Akkar



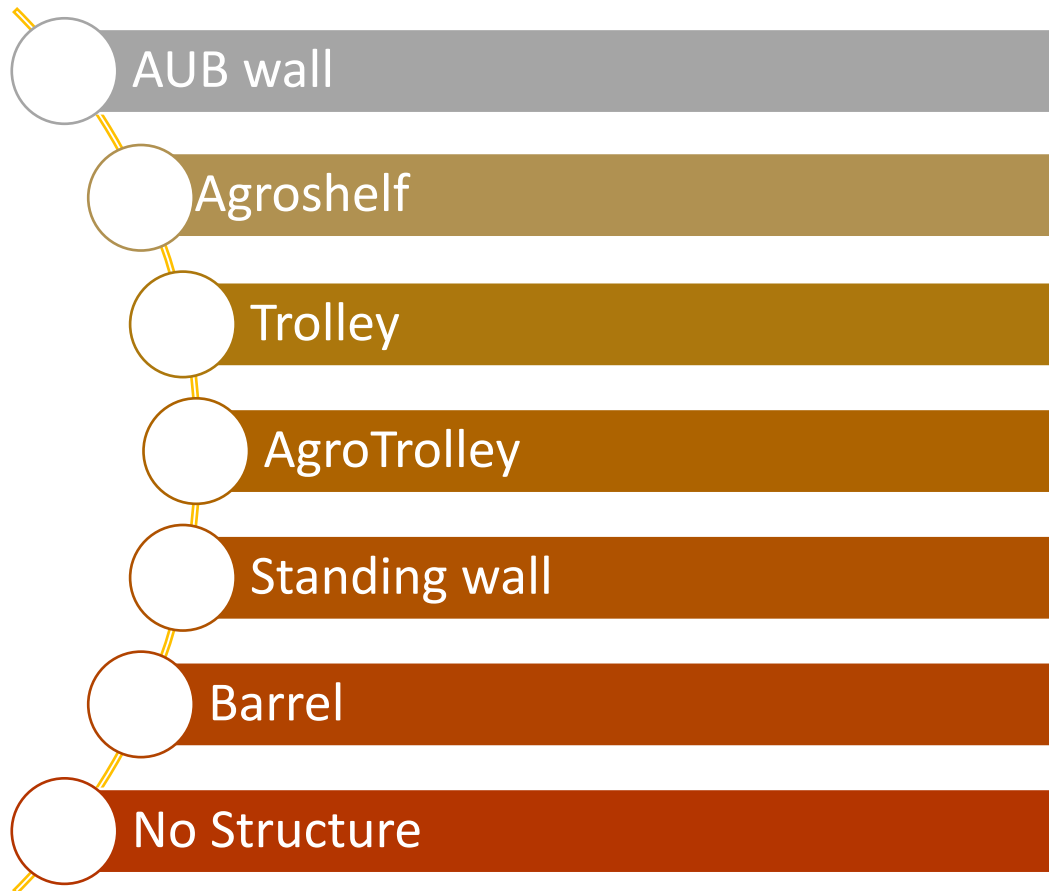
Beneficiaries Bekaa





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## Units Adopted :





## AUB wall



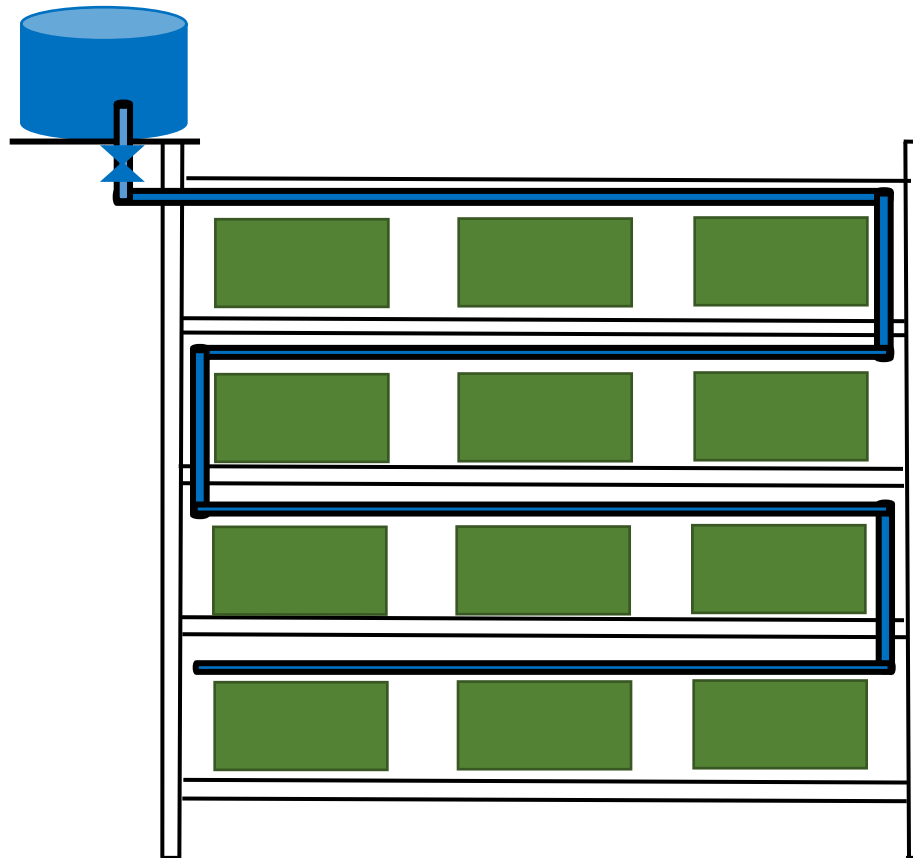
- Dimensions : 1.6 m x 1.4 m x 0.5 m
- 12 plastic boxes (45 cm x 30 cm x 10 cm)
- Space needed : 1.5 m<sup>2</sup>
- Planting area 1.6 m<sup>2</sup>
- planting mix volume needed : 162 l
- Drip Irrigation





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## AUB wall Irrigation Layout





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## Agroshelf



- Dimensions : 1 m high, 1.5 m long, and 0.5 m wide
- 15 plastic boxes (45 cm x 30 cm x 10 cm)
- Space needed : 1.5 m<sup>2</sup>
- Planting area : 2 m<sup>2</sup>
- planting mix volume needed : 202 l
- Irrigation : Water cane



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## Trolley



- Dimensions : 1.2 m x 1.1 m x 1.1 m
- 32 plastic boxes (45 cm x 30 cm x 10 cm)
- Space needed : 4.4 m<sup>2</sup>
- Planting area : 4.3 m<sup>2</sup>
- planting mix volume needed : 432 l
- Irrigation : Water cane



## Agrotrolley



- Dimensions : 1.2 m high x 2 m wide x 2 m deep
- 27 plastic boxes (45 cm x 30 cm x 10 cm)
- Space Needed : 9 m<sup>2</sup>
- Planting area 3.6 m<sup>2</sup>
- planting mix volume needed : 364 l
- Irrigation : Water can





## Standing Wall



- Dimensions : 1 m H x 2 m L x (0.5 m x 0.3 m) W
- plastic ECO boards are pierced
- # holes 176 holes ( 7 cm diameter each)
- Space needed : 3 m<sup>2</sup>
- Planting area 1.27 m<sup>2</sup>
- planting mix volume needed : 800 l
- Irrigation : Water can



## Barrel



- Dimensions : 1 m H x 0.5 m diameter
- 25 holes (5 on each level)
- Space needed : 2.3 m<sup>2</sup>
- Planting area 0.375 m<sup>2</sup>
- planting mix volume needed : 186 l
- Irrigation : Water can





## No Structure



- Dimensions : (45 cm x 30 cm x 15 cm)
- 20 plastic boxes
- Space Needed : 2.7 m<sup>2</sup>
- Planting area : 2.7 m<sup>2</sup>
- planting mix volume needed : 405 l
- Irrigation : Water can





## Characteristics of a good planting mix

- ✓ Well drained, which means an air-filled porosity of at least 15%
- ✓ Re-wets easily – some media are difficult to re-wet if they dry out
- ✓ Suitable pH, between 5.5 and 7 is satisfactory for most plants
- ✓ Free of pests, weed seeds and fungal pathogens





## The chosen planting mix

### Planting mix (1)

- Peat moss (33 %)
- Potting soil (33%)
- Perlite (33%)

### Planting mix (2)

- Potting soil (90%)
- Perlite (10%)



## Site selection recommendations:

- **Must have abundant water supply**
- **Space availability**
- **Willingness of the beneficiaries to be part of such agricultural techniques**



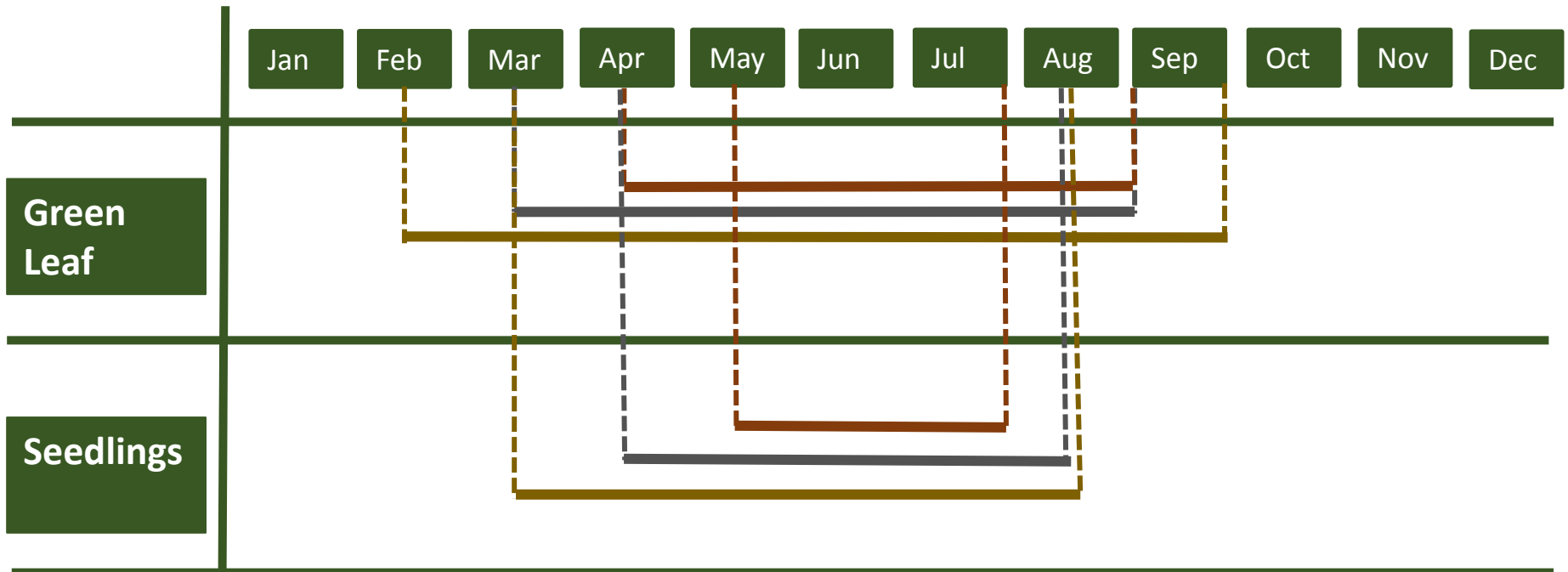
## Seeds used:

1. Bakla or Purslane
2. Parsley
3. Green zaatar or Thyme
4. Spinach
5. Lettuce
6. **Radish ( Not recommended )**
7. Rocca
8. Hindbeh or Dandelion
9. Rashad or Garden cress Coriander





## Planting time versus altitude



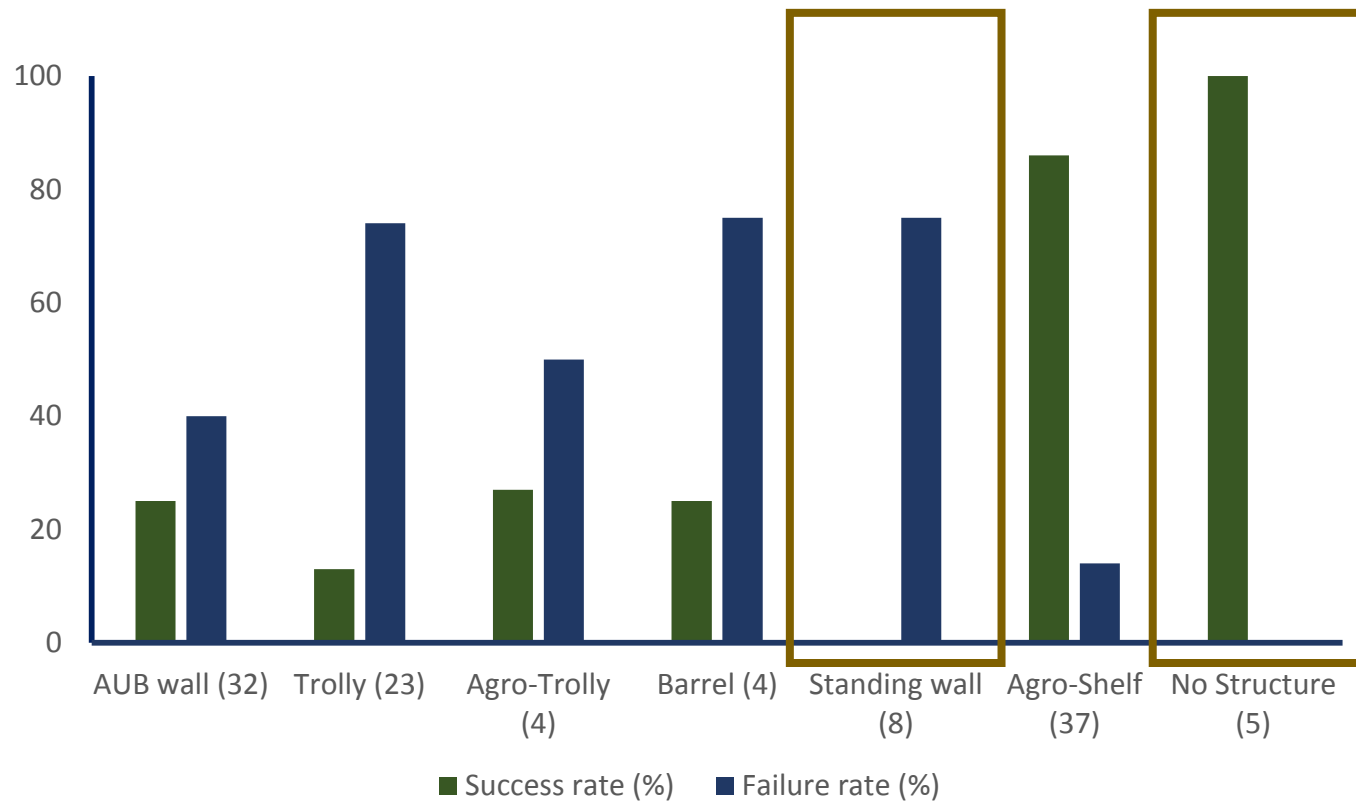
- 550- 1200 m above sea level
- 250- 550 m above sea level
- 0 – 250 m above sea level



Structures	Advantage	Disadvantage
AUB wall	<ul style="list-style-type: none"><li>• can utilize space more efficiently</li></ul>	<ul style="list-style-type: none"><li>• Vertical plants will tend to dry up fast and soil will be lost during the irrigation.</li></ul>
Agroshelf	<ul style="list-style-type: none"><li>• Can utilize space more efficiently</li></ul>	<ul style="list-style-type: none"><li>• Cost high compared to others</li></ul>
Trolley	<ul style="list-style-type: none"><li>• Can accommodate significant amount of boxes</li></ul>	<ul style="list-style-type: none"><li>• Vertical plants will tend to dry up fast and soil will be lost during the irrigation</li><li>• Heavy and needs a flat surface</li></ul>
Agrotrolley	<ul style="list-style-type: none"><li>• Can accommodate significant amount of boxes</li><li>• Easier to irrigate</li></ul>	<ul style="list-style-type: none"><li>• Heavy and needs a flat surface</li></ul>
Barrel	<ul style="list-style-type: none"><li>• More plants per square meter</li></ul>	<ul style="list-style-type: none"><li>• Difficult to manufacture</li></ul>
Standing wall	<ul style="list-style-type: none"><li>• High production</li></ul>	<ul style="list-style-type: none"><li>• High amount of soil</li><li>• Expensive</li><li>• Heavy</li></ul>
No structure	<ul style="list-style-type: none"><li>• Low cost</li></ul>	<ul style="list-style-type: none"><li>• Needs more space</li></ul>

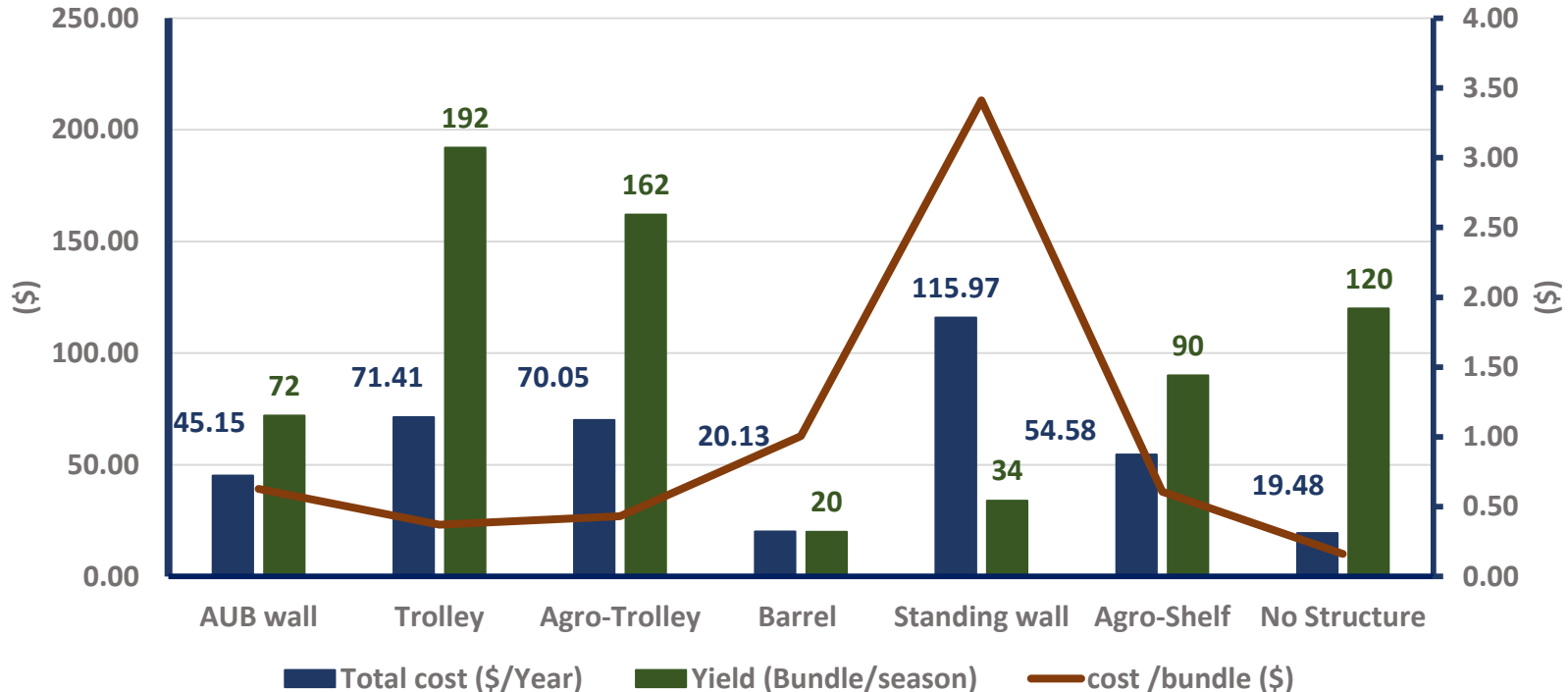


## Performance rates of each one of the units





## Comparative economic return per units



**Costs:** Material costs discounted over 3 years

**Yield:** sale value of total bundle produced over one season

**Costs/bundle:** Over 3 years, average production costs for a single bundle of parsley.



## Recommendations :

- Visit the site daily , especially the first 2 weeks
- Choosing the site is critical, example some Syrian sites in Bekaa receive water weekly through UN agencies and in some cases delivery might be late 1 or 2 days , which might damage the crop
- Give all beneficiaries same types of units
- If tomato and other vegetables are used , a plant protection program should be adopted prior to implementation. As most pests travel by air.





- The beneficiaries need to express clearly their interest in gardening
- Water need to be available free of charge without competing with any human need
- Sufficient space and shade need to be available. In no circumstance the micro garden units should represent a hazard e.g. in obstructing emergency exit.
- It should be restricted to vegetables which can grow fast, with little soil and with no chemical pest and disease control measures
- Since the benefit from micro gardens is as much the occupational therapy side as the real production, it is recommended to include micro garden activities within a social support program like establishment of educational school gardens, women's group support, etc.



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# Organic Pest Control Remedies

Link to Training Document:

[http://www.2shared.com/document/XD5tSkeQ/Brochure\\_2.html](http://www.2shared.com/document/XD5tSkeQ/Brochure_2.html)

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## What makes the agricultural product Organic?

- ✓ "organic" does not automatically mean "pesticide-free" or "chemical-free". In fact, under the laws of most countries, organic farmers are allowed to use a wide variety of chemical sprays and powders on their crops.
- ✓ Pesticides, if used, must be derived from natural sources, not synthetically manufactured
- ✓ Pesticides must be applied using equipment that has not been used to apply any synthetic materials for the past three years



## Why using organic pest control remedies?

- ✓ Inexpensive
- ✓ Natural
- ✓ Efficient

# 1- Garlic Spray

Garlic spray is a general **pest deterrent**

## Ingredients

- 10 garlic heads
- 5 small hot chillies
- 3 medium onions
- 1 litre of water
- 2 tablespoons of milk

## Directions:

- 1) Mix garlic, chillies and onions with water, bring to boil and simmer for 10 minutes
- 2) Let it stand over night then add 2 tbs of milk
- 3) Store in labelled glass jars
- 4) **Use by diluting 1 cup of the mixture to 9 litres of water**



**Don't apply on sunny day, can cause foliage to burn**

## 2- Molasses Spray

Molasses Spray is a feeding deterrent for chewing insects (caterpillars, grasshoppers, cabbage moths and grubs) on the cabbage family

### Ingredients

- 1 tbs of molasses
- 1 litre of water
- 1 tbs of liquid organic soap
- 1 tbs of vinegar (optional)

### Directions:

- 1) Mix molasses with hot water until you obtain the colour of light tea
- 2) Mix in dishwasher to help the molasses stick to the leaves
- 3) **Spray with undiluted solution on top and under the leaves**
- 4) Add vinegar to make it stronger

## 3- Onion Spray

Onion spray is used to control aphids, spiders and other pests

### Ingredients

- 2 cups of onion and ends (and/or garlic pieces)
- 1 litre of warm water



### Directions:

- 1) Collect 2 cups of onion skins, peels and ends in a container. Garlic pieces can also be added
- 2) Fill the container with warm water. Soak for a few days (up to a week)
- 3) After one week, strain or sieve out the onion bits (and garlic bits if used) and store the solution in spray bottles
- 4) **Spray the undiluted solution on top and bottom of leaves**
- 5) You can bury the sieved onion and garlic bits pieces around the plants

## 4- Vinegar Spray

Vinegar spray is for cabbage moths and grubs affecting the cabbage family, caterpillars and sap-sucking insects such as stink bugs, aphids and mealy bugs

### Ingredients

- 1 cup of vinegar
- 3 cups of water
- 1 teaspoon of liquid organic soap

### Directions:

- 1) Mix the vinegar and water
- 2) Add the liquid organic soap to help the vinegar to stick to the insects and leaves of the plant
- 3) Spray on top and bottom of leaves



## 5- Chamomile Tea Spray

Chamomile tea is a mild fungicide

### Ingredients

- 1 chamomile tea bag
- 1 cup of boiling water

### Directions:

- 1) Pour boiling water over a chamomile tea bag
- 2) Leave to soak for 10 minutes then remove the tea bag
- 3) **Once cool, use as a spray**



## 6- Pepper/Garlic Pesticides Spray

Pepper/Garlic pesticide is a general pesticide for control of caterpillars, ants, mites and other insects

### Ingredients

- 3 hot green pepper
- 2 or 3 garlic cloves
- 1 teaspoon of liquid organic soap
- 3 cups of water



### Directions:

- 1) Crush the garlic and pepper together
- 2) Add liquid organic soap and water and mix. Let the mixture stand for 24 hrs
- 3) **Strain out the pulp and spray the liquid onto infested plants, making sure to coat both tops and bottoms of leaves**

## 7- Milk Spray

Milk spray is a fungicide spray (e.g. used for treatment of powdery mildew)

### Ingredients

Equal parts of full cream milk and water

### Directions:

- 1) Mix equal parts of full cream milk and water
- 2) Spray plants every 2 days to control fungal diseases on pees, green peppers and pumpkin family



## 8- Vegetable Oil Spray

Vegetable oil spray is used for scaled and soft bodies insects such as mites, aphids, mealy bugs (oil suffocates insects)

### Ingredients

- 1 tbs of liquid organic soap
- 1 cup of vegetable oil

### Directions:

- 1) Mix the liquid organic soap and the vegetable oil
- 2) Mix together until it turns white then store it in an air tight bottle
- 3) Dilute 1 to 2 tbs of the mixture to 1 cup of water in a spray bottle. Spray on plants covering all leaf and stem surfaces



# There are other plants you can use for general pesticides

The following plants also contain anti-fungal or antibacterial chemicals that can be extracted and sprayed onto crops



Chamomile



Chives



Eucalyptus



Garlic



Horseradish



Marigolds



Parsnips



Turnips



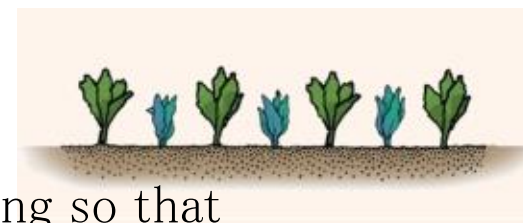
Rhubarb



Thyme

## Other Pest Control Hints

- Pull out weak, infected plants and destroy them away from garden
- Build healthy soil through use of compost, manure and mulch
- Minimize insect habitats by weeding regularly
- Interplant and rotate crops so that pests and diseases do not spread throughout the garden
- Spray the pest remedies over plants early in the morning so that leaves remain dry most of the day, as wet leaves encourage insect activity and fungal damage to plants



## Other Pest Control Hints cont.

### Use companion plants to mask smells

Herbs and highly aromatic plants such as



and other herbs that have spicy/bitter scents, can be used to mask the scent or appearance of crops that are desirable to pests.



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THANK YOU