



Tomatoes - Introduction

Growing tomatoes for U Can Grow is a great way to earn income. When planning your tomato crop, take care to plan for the following factors:

- Exposure of fields to wind:
 - The more and the stronger the wind is that the plants is exposed to the more difficult it is for the plant to grow optimally. If you have no choice but to plant in windy areas, establish windbreaks to protect your crop.
- Exposure of fields to sunlight:
 - The extent to which the crops are exposed to sunlight determines the amount of light exposure, as well as the temperature to which plants will be exposed. The temperatures and sun exposure will influence the growth of the crops. The amount of light and the length of day (number of hours of light) could also be important in determining crop development and should be considered when choosing a crop. High temperatures and arid, dry soil may cause root shock as the roots are taken out of a moist, cool environment and exposed directly to harsh conditions. To avoid root shock one must plant crops during the coolest time of day and water them properly. Make sure soil is moist before planting.
- Humidity:
 - The more humid an area the higher the potential for more fungal growth. This is not desirable for many crop types, especially those susceptible to fungal infection. The changes in humidity during the course of the season must also be taken into account.
- Air:
 - Plants need a balanced amount of oxygen and carbon dioxide in order to grow optimally. If they are in an area where the air is polluted they will not be able to photosynthesized effectively, which will lead to reduced growth.

Tomatoes: Testing the learning: Introduction

- Are windbreaks important to safeguard the crop? Yes/No
- Humid conditions may cause the crop to get fungal infections. True/False



Tomatoes – Land preparation

Basic steps to prepare the ground you will plant your tomatoes into:

- Mark out the growing area
- Clear the bush and trees from this area
- Plough in the grasses, turning over the soil down to 500mm
- Take a soil test to your local store to plan the fertilisers you will need
- Topography Refers to the Slope and Angle of the fields.
 - Consider the angle at which sun shines on the crop and height above sea level.
 - Consider also the situation of the land in relation to mountains or water bodies.
 - These factors will influence weather factors such as frost, snow, the frequency of rainfall.

Tomatoes: Testing the learning: Land Preparation

- Have you marked your growing area? Yes/No
- Soil needs to be tested. True/False



Tomatoes – Water management

Watering your crop is very important. Too little or too much water can both have a negative effect on the crop. Plan your watering program with your agent, taking into consideration:

- Water must be tested to determine quality of water.
- Irrigation will be necessary in the weeks where there is no rainfall. The availability and quality of this water used for irrigating the crop is important.
- Having an abundance of poor quality water is of no use to a crop producer.
- It may be required to put the water through a cleaning or filtering process before use.

Tomatoes: Testing the learning: Water Management

- Is water quality important? Yes/No
- Having a lot of poor quality of water to irrigate crop is good. True/False



Tomatoes – Irrigation

It helps to cultivate superior crops with the water supply as per need of the crops. Ultimately it helps in economic development. Irrigation water improves water conditions in the soil, increases the water content of plant fibres, dissolves nutrients, and makes them available to plants.



- Irrigation carries important nutrients from the soil.
- Triggers germination.
- Process of photosynthesis.
- Without water, plants simply won't grow.
- Irrigation systems provide water.
- Surface irrigation such as border irrigation, furrow irrigation, and other forms of irrigation that use flooding.
- 6000 cubic meters of water a season per hectare

- Water required - per 17 000 plants
 - In month one – 0,5lt per plant is needed
 - Month two - 1lt per plant
 - Month three – 2,5lt per plant
 - Month four to eight - 3lt per plant

Tomatoes: Testing the learning: Irrigation

- Does irrigation carry nutrient? Yes/No
- Will plants grow without water? Yes/No
- Do you have a water logging?



Tomatoes – Planting

Tomatoes can be grown from seed, however planting seedlings will be a more reliable solution.

Germinating and growing seedlings is best done on the same trays as those you will use to dry tomatoes.



Seeds should be planted into individual trays together with the inoculant (feeding fertiliser) provided by the agent. Seedlings must be kept moist at all times, however they must not be drowning in water.

Seedlings should be planted into a small hole of around 50mm deep. Each seedling should be planted into the soil, as prepared per the directions earlier in the U Can Grow module.

Tomatoes: Testing the learning: Planting

- How can I ensure that I get good healthy plants? Should I plant seeds or seedlings?
- Can I plant any tomatoes? Y/N



Tomatoes – Seed and fertigation (compost or mulching)

When joining the U Can Grow program, the agent will help you to find the right seed or seedlings for the program. The choice of seed is prescribed by the off-take partners.

Like seed, the fertigation program is also set out. Your agent will help you plan which of the fertilisers you will need and when.

Tomatoes: Testing the learning: Seed and fertigation (compost or mulching)

- Can I choose any tomato seeds I want? Yes/No
- Who will help me plan when I must fertilise my crops?



Tomatoes – Pests

Record keeping of all farming activities needs to be recorded on this program, such as fertilizer applications, foliar sprays, disease, pest control, and fungal infections. Refer below to the table where you can take a photo of your farming program.

Not all pests are bad. Beneficial insects fall into a variety of categories, two of which are predators and parasites.

- Predators hunt and feed on pests
- Parasites hatch inside or on a pest, and then they eat the pest as they grow.

Managing the pest program

1. You need to be able to recognize the difference between pests and beneficial insects.
2. Then try to minimize insecticide applications, because many insecticides will kill the good and the bad the pests.
3. Only use selective insecticides that target a particular pest and use spot-treatment if possible.
4. Maintain the habitat of beneficial insects by leaving crop residue on the ground and preserving woodlots, windbreaks, fencerows, and un-mowed grassy ditch banks and waterways.
5. Provide pollen, nectar sources, or artificial food for the good pests. This is especially important for the bees.
6. Harmful insects will attack or damage plants or eat the crop.
7. Harmful insects can also spread disease.
8. Harmful insects can be controlled by introducing or maintaining beneficial insects in the fields or orchards.

Testing the learning:

- Beneficial insect fall into two categories, name them?
- Can insect spread diseases? Yes/No



Tomatoes – Disease

The control of plants diseases rests on five basic principles. The disease a plant gets is called a pathogen:

- Exclusion:
 - Exclusion of a disease is based on excluding a disease from an area where the disease is not yet present.
 - Total exclusion is not practical but it can be achieved to some extent through using pathogen free propagation material. By this we mean, it is important to know where your seed and seedlings are coming from.
 - For this to be implemented fully a well-managed certification scheme is required
- Eradication:
 - Eradication of a disease/pathogen is targeted at the method of survival of the pathogen.
 - Treatment must be aimed at eliminating the disease/pathogen from an area.
- Protection:
 - Focuses on the protection of the plant against the pathogen.
 - Protection places a barrier between the crop plant and the pathogen.
 - An example of protection against diseases is the implementation of a chemical spray programme for a crop.
- Resistance breeding:
 - Refers to the process where the genetic composition of the crop is manipulated so that the crop is resistant to attack from a pathogen.
 - Again, this makes it important for the farmer to get seeds and seedlings from approved suppliers.
- Tracking and tracing of the crop is important to ensure that the crop can be sold to the buyers. This requires the farmer to log all farm steps and is called certification. This includes:
 - Introducing quarantine measures.
 - Certifying propagation materials as disease free.
 - Limiting the transport of potentially infected material from a high risk to a low risk area is also included in the certification system.
 - The success of a certification system relies on good management and the introduction of an inspection system.

Testing the learning:

- Can I plant any seeds or seedlings? Yes/No
- Why must I log all my actions when farming?



Tomatoes – Chemical

All chemicals are poisonous and dangerous, therefore should be handled with great care. Always read the label for proper usage (dosage), handling, and pre-harvesting intervals.

As before, the use of chemicals must be planned for with your agent. Ideally no chemicals will be needed, but if they are needed, here are some of the ones you may need to get your agent to assist you with.

Chemicals
Dalgin active
Cupratrix (Kocide)
Dithane *2
Thiovit WP (wetable sulphur) *3
Ridomil *4
Folicur *5
Codafol K 35
Bellis
Lepistop
Karate (synthetic pyrethroid) *9
Altacor
Confidor

Testing the learning:

- Chemical are not dangerous? True / False



Tomatoes – Harvest and Packing crop

Tomatoes should be harvested when bright red, to be washed in clean water, then cut open and spread on tables to dry, salt to be applied. (Brine or salt process) Dry for three days.

NB! Check colour, dust, fungus, and foreign objects. Grading to be done at the farm.

Tomatoes are normally for a better product harvested by hand.



Tomatoes is a dependent on the variety and will be ripe within 10 days of the first ones starting.



Tomatoes can be machine harvested, however the quality is not as good and get large amount of waste.



Plastic lug boxes are used extensively in this process.

- Here they are used infield and transported to edge of field and packed on to a vehicle to take back to the shed for sorting.

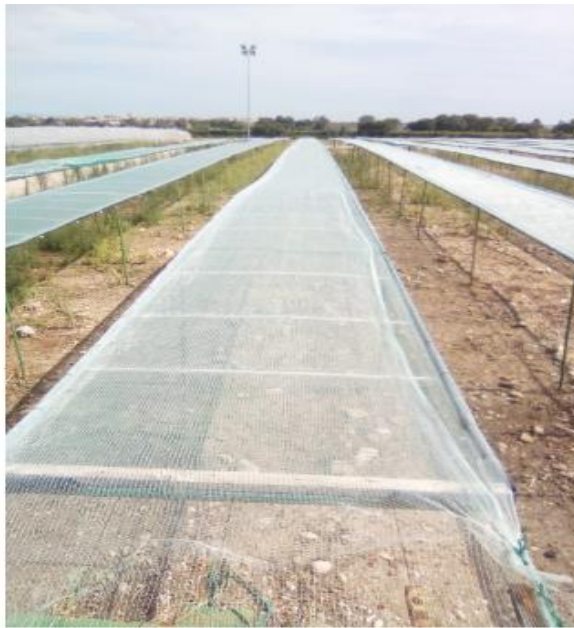




Tomatoes – Drying the crop

Tomatoes should be harvested when bright red, to be washed in clean water, then cut open and spread on the structure is the same as seedling propagation tables are constructed using metal or wood.

- Size is normally 1,5m wide by 50 m long.
- The support is by cables and batons running across.
- The table stands 0.75 m high.
- The table is covered with a shade cloth.
- The % is very low see next picture.
- You want moisture and air to move freely, the cloth is to stop insects and dirt. Important to have wind flow and protection from dust.



An alternative solution if dust is a problem is to house the structure for drying under the shade cloth. Just to stop dust.





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- Tomato taken to covered area for cleaning in a bath of fresh clean water.
- Poor quality tomatoes discarded.
- Important to wash dust off.
- Once tomato has been cleaned, they are sorted to check quality and then placed into lug boxes and taken to the sun drying area.



- The lug boxes are crucial to the whole process and can be cleaned and reused constantly. Note the quality is getting better.
- The tomatoes are placed on the shade net table.
- The tomato must be cut top to bottom, never across the tomato as it does not sit well and dry evenly.
- Very important is that the cut must never go right through the tomato.



- Note that you have two identical halves laid out but joined by the back bone of the tomato.
- The tomato is salted using a kitchen flour sieve for shacking the salt on. Note that 1 kg of **course salt** will do one square meter of table. This will vary from area to area.



- Note that the halves are still joined and that they stay open if you cut right through you will find the will close up and not dry.
- The time period is 3 days plus minus
- See the salt grains and the size of the holes in the netting.
- What is important is that the tomato is placed on the net and covered with another piece of net to keep off insects and dust.



- Please note that the salt can be applied by a mobile machine that runs between the tables very easy to construct using battery power.
- This application uses brine and not coarse salt.





Testing the learning:

- Why do we wash the tomatoes?
- The tomato must be cut top to bottom, never across? True / False
- Why do we cut the tomatoes with net?
- Two methods of harvesting tomatoes, please name them?
- Which harvesting method there is more waste?



Tomatoes – Packaging

Tomatoes need to be vacuum packed plastic bags. These plastic bags will be sealed in cardboard boxes.

Testing the learning:

- What do we pack tomatoes into?



Tomatoes – Micro Jobbing

Date	Task	Proof of task
Daily	<ul style="list-style-type: none"> • Walk around the crop • Pull out the weeds • Look for any signs of pests (small bugs) or diseases • Ensure there is enough water 	
Day 1	Prepare lands	Take a photo of the land before you start preparing it. Share a photo of the land once you have made it ready to start planting.
Day 2	Planting seed Planting and spacing	Share a short video to illustrate the planting
Weekly tasks	How much water mix did the crop get this week?	Take a photo of your weekly water log book
	Did you add compost/mulching? If yes, how much.	Take a photo of your weekly compost/mulching log book
	Were there lots of weeds to take out?	Take a photo of the weeding growing on your land
	Did you need to organic spray for pests? If yes, how much.	Take a photo of the organic spray using
	Did you need to organic spray for diseases? If yes, how much.	Show us by that a photo of the diseases and what organic spray you are using
Harvesting	When this crop is ready to be harvest, between 11 to 12 weeks	Share a short video
Please log the follow at harvest time:	Date	Fill in
	Quantity	Fill in
	Grade	Fill in
	Root length	Fill in
Post-harvest handling		Send us a short video of your product (end product)