

**2019**

# TUNNEL FARMING

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***Turn Potential Into Profit***



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## Introduction to Tunnel Farming



There is a great demand of vegetables throughout the year. Prices are at the highest at the start and end of the season. Farmers can get high returns on different crops if modern techniques are applied to grow off-season crops in Pakistan.

Vegetables & fruits can be cultivated in off-season by using tunnel farming technology, in which temperature and moisture is controlled for growth of crops in specific conditions.

The availability of vegetables all-round the year, enables the farmer to fully utilize their resources and achieve higher income as compared to traditional seasonal crops.

### The Benefits of Tunnel Farming:

Tunnel farming grows vegetables beneath protective plastic tunnels and as a method it produces vegetables that are very nutritious and creates large yields.

The use of tunnels has enabled farmers to protect their crops from inclement weather and differing temperatures. The produce from the tunnel farming gives high volumes of payback as compared to seasonal vegetables grown.

### Factors for Successful Tunnel Farming:

Following principles need to be followed for the higher productivity of proposed fruits and vegetables:

- Proper soil analysis for determining soil nutritional level.
- Use of high quality hybrid seeds.

- Fertile land and its maintenance within the tunnel during the period of cultivation.
- Selection of profitable vegetables on the basis of best analysis of cost and revenues for a given season.
- Cost efficiency through better management.
- Timely control of pests, diseases and exercise of all recommended agronomic measures.
- Maintenance and control of internal temperature and humidity of the tunnel.
- Timely irrigation, fertilization, training and grading of plantation.
- Fertilization as per recommendation of experts.
- Appropriate post-harvest planning for washing, grading, packing, and transportation of product to the market.

### Types of Tunnel Farming:

Following are three different types of tunnel farming techniques that are used in Pakistan to grow off season vegetables & fruits.

#### 1. Low Tunnel Farming:

Off-season vegetable cultivation is recommended with the use of low tunnel farming technique in Pakistan. It is the cheapest among the available options and quite similar to conventional farming methods. These tunnels are suitable for heavy individual fruit bearing crops, i.e. melons, watermelons, pumpkins, round gourds, squashes etc. This is a very effective and commonly used method among the farmers.

The estimated yield potential of the farm varies according to the type of crop. With above mentioned crop mix, combined yield of 96 tons per season can be achieved excluding wastage which is 30 percent higher than the conventional seasonal crop.

**Structure:**

Each tunnel is approximately 200 feet long, 3.5 to 4 feet high and 4 feet wide. The tunnel is built by a 1/4-inch diameter Iron rod of 10 feet length, in half moon shape.

The plastic pipes are placed at regular intervals of approximately 10 feet. Each tunnel structure will then be covered by a 0.04 mm thick and 10 feet wide plastic sheet. Approximately 25 tunnels can be constructed on an acre of land depending on the type of vegetable, i.e. watermelon, muskmelon or round gourd.

The cost of stated structural and material requirement of such tunnel varies depending upon the type of material used for structure including the cost related to plastic used as a shield (cover) and mulch.

**2. High Tunnel Farming:**

Off-season vegetables, such as, tomatoes, chilies / hot pepper, cucumber, brinjal, sweet peppers, ridge-gourd and bitter-gourd can be cultivated using high tunnel technology. The estimated yield potential of the farm varies according to the selected type of vegetable.

**Structure:**

Each tunnel is approx. 200 feet long, 10 feet high and 30-32 feet wide. The tunnel is built by 2-3 inch diameter bamboo having 8.5~20 feet length. The bamboos are fixed at regular distance of approximately 10-15 feet. Each tunnel structure will then be covered by 0.10 mm thick plastic sheet. Approximately 6 tunnels can be constructed on an acre of land depending on the type of vegetable, i.e. tomato, sweet pepper and cucumber.

The cost of stated structural and material requirement of such tunnel varies depending upon the type of material used for structure including the cost related to plastic used as a shield (cover) and mulch.

**3. Walk-In Tunnel Farming:**

Off-season vegetable cultivation is recommended with the use of walk in tunnel structure on the basis of its low construction cost.

Off-season vegetables, such as, tomatoes, chilies, cucumber, brinjal, hot pepper, sweet peppers, watermelon, muskmelon, pumpkin, ridge-gourd and bitter-gourd can be cultivated using walk-in tunnel technology.

**Structure:**

Each tunnel is approximately 200 feet long, 8 feet high and 12 feet wide. The tunnel is built by ½ inch galvanized iron of 20 feet length, in half moon shape.

The plastic pipes are put at regular intervals of approximately 10-15 feet. Each tunnel structure is covered by 0.08 mm thick and 20 feet wide plastic sheet. Approximately 14 tunnels can be constructed on an acre of land depending on the type of vegetable, i.e. cucumber, bitter gourd and hot pepper.

#### Temperature Requirements:

No.	Produce	Temp °C
1	Cucumber	24-18
2	Capsicum	24-21
3	Tomato	29-21
4	Sweet Pepper	24-21
5	Bitter Gourd	29-21
6	Filed Pumpkin	24-18
7	Crookneck Pumpkin	24-18
8	Bitter Gourd	24-18
9	Zucchini	24-18

#### Growing Season:

Vegetable	Sowing Time	Transplanting	Direct Sowing
Cucumber	1-15 Oct	1-15 Nov	-
Capsicum	-	-	15-31 Oct
Tomato	1-15 Oct	1-15 Nov	10-20 Nov
Sweet Pepper	1-15 Oct	1-15 Nov	10-20 Nov
Bitter Gourd	-	-	10-20 Nov
Filed Pumpkin	-	-	After Mid Jan
Crookneck Pumpkin	-	-	After Mid Jan
Bitter Gourd	-	-	After Mid Jan
Zucchini	-	-	After Mid Jan

#### Planting Distance for Optimum Yield:

Vegetable	Plant to Plant Distance	Row To Row Distance
Cucumber	30 cm	75 cm
Capsicum	30 cm	100 cm
Tomato	30 cm	100 cm
Sweet Pepper	50 cm	150 cm
Bitter Gourd	45 cm	200 cm

Filed Pumpkin	30 cm	200 cm
Crookneck Pumpkin	50 cm	300 cm
Bitter Gourd	50 cm	300 cm
Zucchini	50 cm	300 cm

#### Useful Links:

[www.smeda.org.pk](http://www.smeda.org.pk)

[www.pfa.gop.pk](http://www.pfa.gop.pk)

[www.punjab.gov.pk](http://www.punjab.gov.pk)

[www.icid.punjab.gov.pk](http://www.icid.punjab.gov.pk)

<https://www.agribusiness.com.pk/tunnel-farming-materials/>

[www.parc.gov.pk](http://www.parc.gov.pk)

[www.companylist.org](http://www.companylist.org)

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