TOMATO PRODUCTION

Lycopersicon esculentum

There are two types of tomatoes: the staking type that requires support as they grow tall since they fall over when they are heavy with fruits and also the non-staking or bushy **types however it is recommended to stake all tomatoes to reduce wastage due to insect and fungal attacks**. Varieties includes tengeru,rodade,money maker,star 9030,roma,Heinz,nemoneta

CLIMATE, SOILS AND LANDPREPARATIONS

Tomato is a warm season crop that is sensitive to frost. It grows within temperature ranges of 18^0c to 27 ^{0}c.It may also be grown all year round using frost tolerant varieties.

Too much rain promotes fungal diseases.

The soil should be light to heavy loams. In light soils the crop matures early. Good yields are realised from heavy soils. The soils must be well drained. It grows well in pH ranges 5.5-6.8.

Prepare a good seedbed by ploughing 1 or 2 times to a depth of 30cm, followed by 2 or 3 harrowing.

SEEDRATE AND TRANSPLANTING

The seedlings are transplanted from the nursery at 3 to 6 weeks after sowing. To plant a nursery, the quantities of seed required are shown in the table below. Sow the seeds to a depth of 5mm and in lines 7 to 10cm apart.

Hectare	**Quantity of Seed in grams**	**Seedbed Size**
1(10,000m^2)	250	1m x 70m (70m^2)

The crop upon transplanting should be spaced as follows in the main field.

Wet season at 90cm x 45cm and dry season at 90cm x 30cm.This is at small scale level. On the commercial scale, the spacing is 120cm x 60cm and 100-120cm x 40cm for drip systems. Bushy types must be spaced 120cm x 45cm and staking types 100cm x 45cm.

With directly sown tomatoes, you require more seeds as indicated below.

Hectare	**Seed grams**	**Quantity of Seed in Kilograms**
1 (10,000m^2)	1000g	1kg

The number of seeds per station should be 5 and spacing 120cm x 60cm.The seeds being placed 4 cm from each other.

MANURING AND FERTILISATION

Apply both Farm yard manure and compound fertilisers, before planting or after planting. The manure should be well incorporated into the soil.

The top dressing fertiliser is applied as ammonium nitrate and potassium chloride.

Hectare	**Farm Yard Manure (kg)**	**Compound D (Kg)**	**Top Fertiliser (KCl)potassium chloride kg**	**Top Fertiliser NH_4NO_3 (Kg)**
1(10000m^2)	10,000	500	90	150 (2 splits)

The potassium chloride is split and applied two (2) times. Apply first one when fruit is 3 cm in diameter and the next 4 weeks after the first while the ammonium nitrate is split and applied 75kg at 3 weeks after transplanting and the second 7weeks after transplanting.

IRRIGATION

Do not use sprinkler irrigation as it might have encouraged blight (early blight and late blight) proliferation (an increase in number). Drip irrigation and flood irrigation more appropriate(recommended)

Initially apply sufficient amount until plant takes (establishes itself). This can be reducing to watering every 3-4days.

In September through to November, it can be done every day.

Inter-cultivations: should be done to control weeds and to promote good drainage and distribution of nutrients.

PRUNING AND STAKING

Pruning is carried out to remove excess/unwanted branches so as to maintain only one (1) or (2) main stems for this helps in fruit quality. The terminal buds are removed in tall growing varieties to limit their growth to 1.5-1.8 meters' high.

Staking is the placing of sticks/stakes near the plant to tie it for support (tall types), so that the plants remain erect. Stake plants 3-4weeks after transplanting or earlier than that for heavy fruiting types.

The important of staking are as follows: -

- Improved fruit size and quality
- Reduce attack by insects
- Reduce soil and water contacts for the leaves
- Easy field managements eg watering, weeding, spraying
- Allows for light penetration resulting in good colour formation in fruits.

PESTS AND DISEASES AND THEIR CONTROL

Pests	**Morphology/Form**	**Feeding habit and Damage/Symptoms**	**Control Measures**
Nematodes	Worm stage, white in colour	Nursery and transplants where they attack vessels and roots.	Ethylene dibromide at rate of 4ml on soil
Red spider mites	Tiny spider like organisms found on the underside of leaves.	Suck plant juices causing leaf to curl and show surface yellowing.	Karate,abaforce,snow tiger,snow busrt and Abamectin
Grasshoppers	Insects	Chew leaves	Malathion sprays
Stink bugs (Green and brown)		Pierce and suck fruits and leaves. Damaged fruits have a blotchy appearance.	Malathion
Termites	Insects	Cut and chew some plants.	Dust or spray with dieldrin.
Aphids	Whitish greenish insects	Feed on the lower part of the leaves and tender shoots. Introduce viral diseases	Any Aphicide
Caterpillar	Egyptian leaf eaters. semi looper	Eat leaves	Servin 20g/10litres of water.

Tomato fruit borer		Tomato fruit borer tunnels into the fruit causing considerable damage. It eventually lead to fruit decay.	Bacillus thuringiensis, Fluxenoxuron
Cutworms			
Diseases			
Damping off	Fungal disease	Occurs in young plants in nursery and main bed.	Spray with Formaldehyde or drenching with 50% Captan 40g/10litres of water apply to $10m^2$
Early Blight (*Alternaria solani*)	Fungal disease	Black roundish spots with sharp edges on the leaves. .	Weekly application of Dithane M45 80% WP,20g/30ltrs of water.
Late Blight (*Phytophthora infestans)*	Fungal disease	Large necrotic areas around the edge of the leaves. Round blackish areas with pale purple blue zone. Attacks stems and roots. April-May	Dithane M45 sprays and copper oxy chloride Tebucon
Blossom End rot or black bottom		Slight water soaked area at blossom end of the fruit, which darkens and enlarges. Its hard to touch with a leathery feel.	Apply lime and manure to soil. Ensure adequate and consistent watering.
Bacterial Leaf Spot		Dark water soaked spots on the leaves, stems and fruits.	Plant disease free seedlings, weed control, avoid sprinkler irrigation. Use copper oxy chloride.

Powdery Mildew		Powdery substances on the leaves	Copper based sprays
Tobacco Mosaic Virus		Light and dark green mottling of leaves, stunting of plants and puckering of leaves.	Resistant/tolerant varieties. Avoid handling of tobacco, and planting on soil previously infected with the diseases.

HARVESTING, YIELD AND HANDLING FOR MARKETING

Flowering starts at about 4 weeks after transplanting. Harvesting starts at 3 months. The yield depends on the seasons variety: 25-50 tonnes/ha.

Keeping harvested crop must be kept in plank or plastic crates. If seeling directly on market must harvest once they have attained maturity – showing a greenish reddish, orange colouration.

Grading is important as it adds value to the crop. Organising a market in advance helps to reduce losses, if you are producing in bulk.