Tomato Production

IDEA-NEW -May, 2010

Noor Mohammad Noori

Tomatoes production

- Tomato are related with solanaceae family
- They are among the most popular and useful of all vegetable
- Tomato consumed fresh or processed as juice ketch up and paste
- Tomato is warm season crop
- Behsood, Battikot, Shin war, Sorkhrud, Khas Kunar, Asadabad, Shigal, Qarghaee and Mehterlam districts are the main production areas

Cultivars

- Hybrids and OP varieties are planted in ER
  - Hybrids:
    - Yaqui, Super Blocky VFN, Xico, Gala, CLX-VF, Dollor-1, Kalaam 1, Lucky
  - OP:
    - Rio Grande, Roma, Super Roma and Roma VF
- All varieties planted are determined type
- ADP/E have been planting Rio Grande, Yaqui, and Beef Tomato

Soils

- Well drained deep havily manured soils
- Tomatoes matures early on sandy soils but silt or clay loam soils are generally more productive
- Moderately tolerant to acidity
- It can grow in soils with pH 5.8-6.8
- Optimum pH is 6.0-6.5

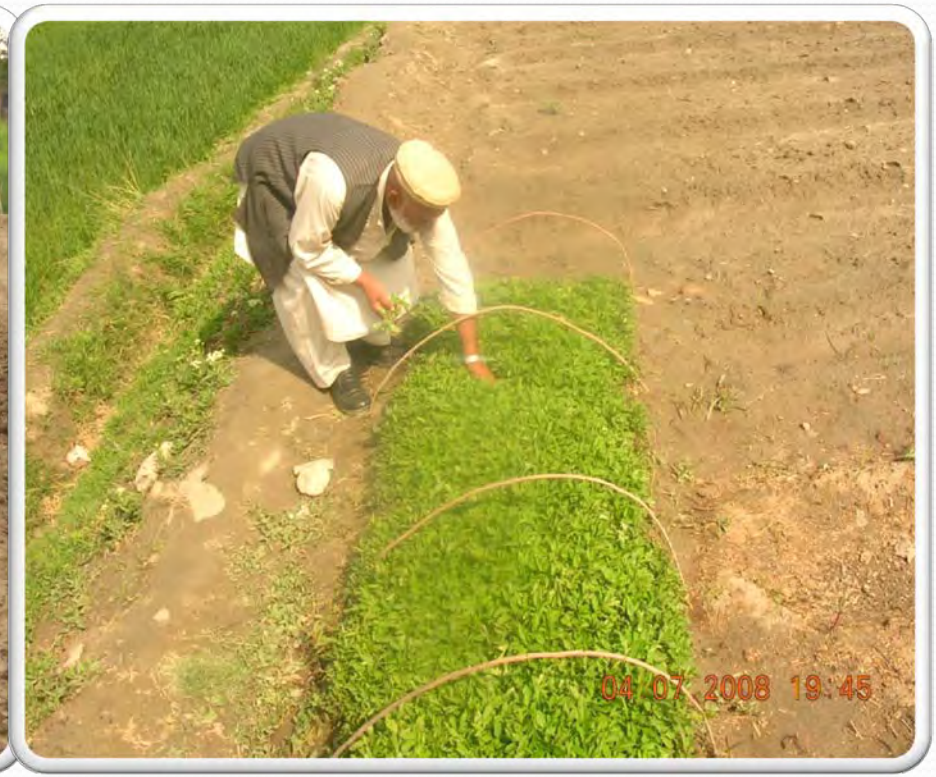
Climate

- Optimum temperatures
  - Seedling growth: 18 – 24 ºC during the day and 15 -18 ºC during the night
  - For growing: 18 – 30 ºC
- Fruit set is very sensitive both with high and low temperatures
- Temperatures > than 27 ºC can cause pollen sterility
- Night temperatures and temperatures < 13 ºC may cause flower to produce oddly-shaped fruit or flower falling without fruit set
- Tomatoes need at least 6 hours direct sunlight to flower
- Excessive humidity can cause leaf disease

Seedling production

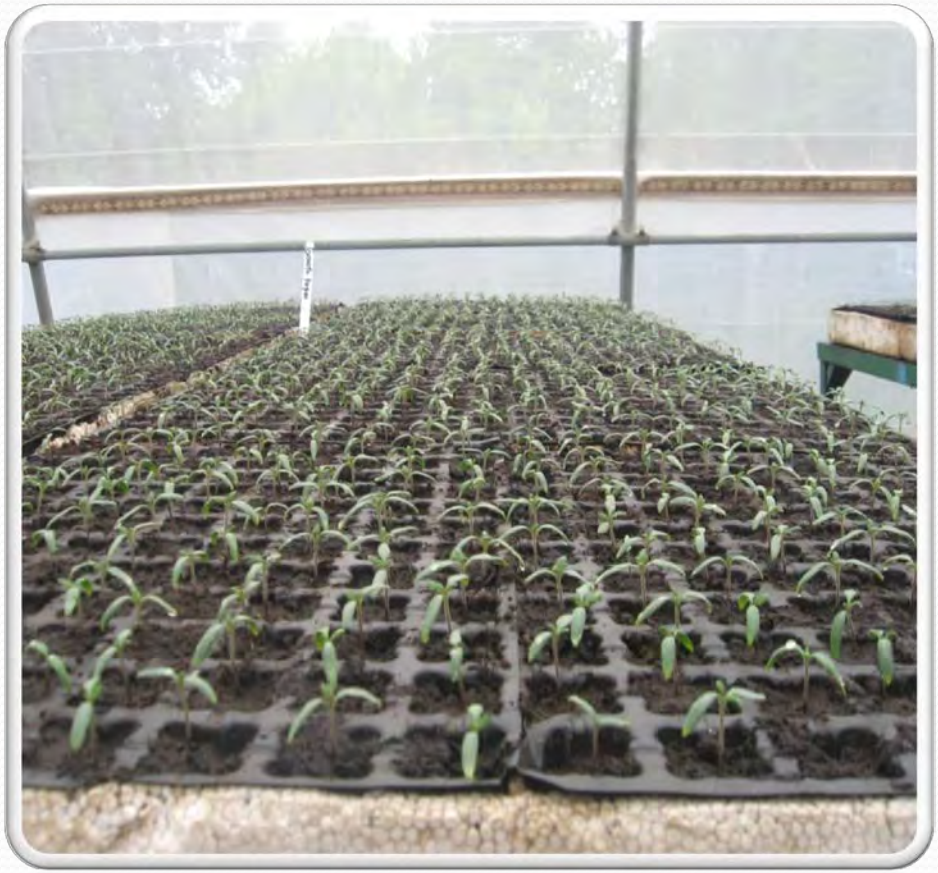
- Field nursery
  - Use a Raise bed for nursery
    - 60 cm wide and 30 cm high
    - Protect the seed from high Temperatures (Mulch)
- Seed rate per Jerib, 70 g
- Seed should be planted at a depth of 1-2 cm
- Seed emergence, 7-14 days
- Seedling ready for transplanting
  - When they are 7-9 cm in height and
  - With 4 - 5 leaf stage

Tomato Field Nursery



Tomato Plug-Seedlings

- Another way to produce tomato seedlings
  - Produce earlier crop
  - Save seed
  - Healthy seedlings, diseases-free and pest-free seedlings



Production Practices

- Bed width 100 cm
- Alternate planting system
- 2 rows per bed,
  - rows are separated 80 cm
- Distance between plants 60 cm
- Over 4,000 plants per Jerib

Staking

- Staking or trellising tomato plants with
  - bamboo poles, wood stakes, or other sturdy material
  - provides support and keeps the fruit and foliage off the ground.
  - Staking can increase fruit yield and size, reduce fruit rot, and ease spraying and harvesting
  - Two weeks after transplanting

Tomato Fertilization

- Tomato plants should be fertilized with organic (animal manure) and/or chemical fertilizers to produce high yields.
- 4-5 T/jerib (FYM) should be incorporated into the soil at the time of land preparation.
- basal application of 50Kg/jerib DAP , 40 Kg potassium sulfate and 50 Kg of urea can be top dressed in two splits, the first, 20-25 days after transplanting and the rest at the pre-flowering stage.

Irrigation

- Insufficient water at any growth stage will reduce yield and fruit quality.
  - Tomato is most sensitive to water deficit during flowering, somewhat sensitive immediately after transplanting and during fruit development, and least sensitive during vegetative growth
- Wilting in the late morning indicates that the field should be irrigated

Irrigation

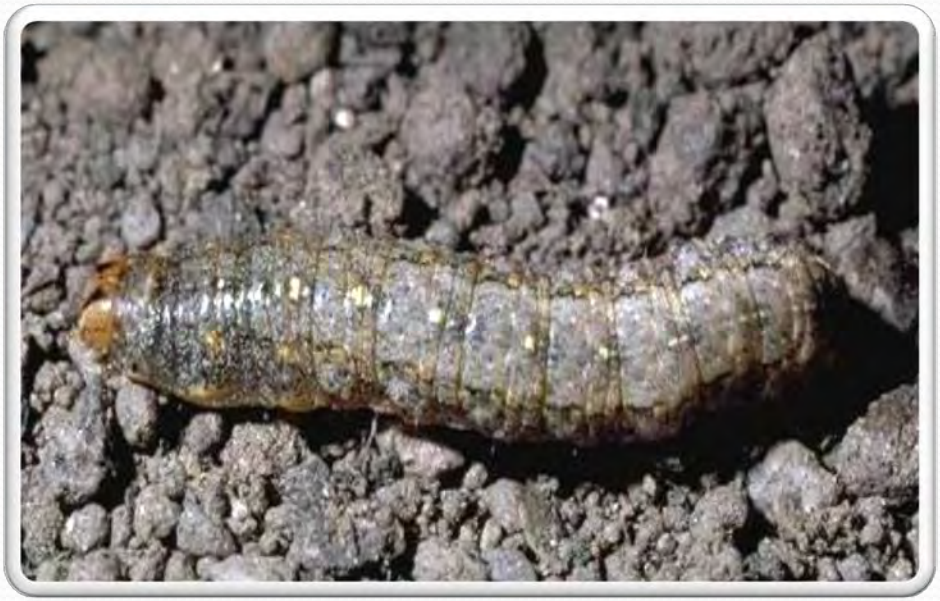
- The root zone of young transplants is shallow so irrigation should be frequent and just enough to recharge the root zone. As the crop develops, the root zone enlarges and less frequent but heavier irrigation is required.

Tomato Fruit Worm

- Tomato Fruit worm (corn ear worm)
  - Larva color are: pale yellow to red, to green, to brown
  - They prefer to feed on green fruit and usually do not enter ripe fruit
- Symptoms
  - Deep watery cavities frequently in the stem end of the fruit
  - Control
    - Thiodan 4 cc/lit
    - Larsbin 4 cc/lit

Cutworm, *Agrotis sp.*

- Cut worm
  - It gives damages to field in two stages; larva stages, when they feed on foliage and fruit
  - Control
    - Larsbin 4 cc/lit
    - Agridon
    - Thiodan 4 cc/lit



Spider Mites

- Spider mites
  - Usually spider are on lower leaf surfaces
  - They inserting their stylet mouthpart into individual plant cells and withdrawing cellular contents
- Control
  - Horticultural oil, horticultural soap and Kelthane are the 3 most popular materials used to combat spider
  - Through spray coverage and timely follow-up treatment

Early Blight

- Symptoms
  - The small black or brown spots on leaves stems, and fruits
- Control
  - Volunteer plants of solanacea family should be destroyed
  - Plant residues should be removed from field and destroyed after harvest
  - Copper oxychloride also used to control early blight

Late Blight, *Phytophthora infestans*

- Symptoms
  - It appear as small, water-soaked areas that rapidly enlarge to form purple-brown, oily-appearing blotches
- Control
  - Cultivation of resistant varieties
  - Eliminate residues of solanacea family from field
  - Mencozeb and binomil also used to control it

Fusarium Wilt, *Fusarium oxysporum sp. Lycopersici*

- Symptoms
  - It begins on outer leaflets and drooping of leaf petiole
  - Leaves become wilt ,turn yellow and die and the entire plant may be killed before plant reaches to maturity
- Control
  - Long crop rotation (4-6 years)
  - Avoid any solanacea family crop
  - Rotate with cereal and grasses if possible

Physiological Disorders

- Blossom end rots
  - Several environmental factors and cultural problems can cause Blossom end rots in tomato
    - Restricted water uptake
    - Growth too rapid and Ca cannot be taken
    - Water loss from leaves during hot weather
  - Water management

Physiological Disorders

- Sunscald
  - Bleached areas on fruits caused by the exposure to sunlight
    - Protect crop against defoliation diseases
    - Plant the crop closer (distance between plants and rows)
    - Less severe pruning practices

Harvesting and Post Harvest Handling

- Tomatoes can be harvested in different stages of ripening, depending upon distance and time needed to market the fruits
  - For long distance transport, fruit can be harvested at the breaker stage (not more than 10% of the surface is tannish-yellow, pink, or red).
  - Fruit for local sale can be harvested at later ripening stages.

Harvest and Post Harvest Handling

- Healthy fruit should be picked, rotten and insect damaged and diseased ones rejected
- Green to pink, sound pink, yellow and fully ripe are picked separately
- In practice fruits are picked by size and location on the plants
- Harvest early in the morning
- Shade harvested fruit, avoid exposing fruit to temperatures higher 25 ºC

Storage

- After harvesting tomatoes should be washed
- Tomato should be submerge in 300 ppm solution of chlorine
- Tomato are repined artificially with ethylene gas in special rooms
- The relative humidity should be 90 to 95 percent
- Mature green tomato start to develop red color in 5 to 7 days at 18-20 ºC
- Tomato will not ripe > than 30 ºC and < than 10 ºC
- In the absence of these type places farmer should store with other fruit that produce ethylene gas like banana

Tomato Harvest, Khushgunbad