# Carrot Production

Noor Muhammad Noori

IDEA-NEW

# Carrot Production in the Eastern Region

- Carrot is cool season crop, but some cultivars can tolerate quite high temperature
- Carrot can be planted from September to January, bi-weekly basis
- Temperature effect
  - Optimum plant growth temperature is (16-24 ºC)
  - high temperatures, reduce root length, may produces fibrous, unmarketable carrots
  - Low temperatures, long root carrots with poor color

# Soils

- Carrots grow well on deep (20-30cm Minimum) friable, well drained soils
- Preferred soil types, are loam and sandy loam
- Optimal soil pH is 5.5 - 6.5
- Sandy soil produces early yield, for higher yields, silt and silt loams are recommended
- Fresh market cultivars are mostly planted in lighter soils (sandy soil)

# Carrot Varieties

- Red and orange varieties are planted in ER
- Varieties planted in Easter region:
  - Temperate varieties:
    - Nantes, Chantenav, Nelson F1, Mokum F1, Napoles F1
  - Tropical varieties:
    - Pusa Yamdagni, Pusa Indian, A Plus, Desi, Long red, Red deep, and All Season Cross.

# Carrot Varieties Planted in ER

Nantes Kronos

# Carrots Planting Techniques

- Carrots are sown *directly onto the field*, a smooth, well prepared seed bed is required
- Raised beds are recommended for carrots production
  - 1.5 m bed center to bed center and at least 25 cm high.
  - Rows should be 25 cm apart
- The soil is cultivated 25cm depth

# Carrot Seeds Planted on Raised Beds

# Seeding Rate

- For easer handling seed is *mixed with sand*
- Seed rate: 2 kg/Jerib
- Carrot seeds germinate in 12-18 days.
- Three to four weeks after sowing, the plants should be *thinned* to 2-2.5 cm between plants to improve root quality
  - 2-3 thinning are needed during crop cycle.
- Expected carrot yields are 4-6 MT/Jerib

# Thinning Carrots

# Thinning

# Carrot Field at Batikot District

# Fertilization

- Carrots should be grown on soils which were heavily manured for the previous crop (cabbage, cauliflower, etc)
- Before sowing,
  - 1 bag of DAP and ½ bag urea per jerib should be incorporated into the soil.
- After last thinning
  - ½ bag of urea/jerib should be top dressed in bands when carrots are one cm diameter
- If the nitrogen is applied too early, it will promote excessive leaf growth and fanging roots (forked roots).
- Do not apply the fertilizer too close to the carrots.

# Irrigation

- The field should be irrigated immediately after sowing for rapid, uniform seed germination and stand establishment
- Carrots have deep roots, they need for continuous irrigation.
- Carrot furrows need for 6-8 times irrigation during the growing season.

# Weed Management

- Youth carrot seedlings *grow slowly*, so it's important to keep weeds under control during early grow
- Both manual and chemical weed control methods can be used.
  - Hoe cultivation should be shallow so that the roots are NOT injured
  - Manual weeding during *thinning*
- For commercial production,
  - Chemicals weed control, Post-emergence herbicides like Linuron, Diuron or Monuron, can be applied at the rate of 200 g/jerib 40 days after sowing.

# Aphids, *Myzus persicae*

- Green peach aphid, transmit over 100 virus diseases
- Virus infested leaves are distorted and curled
  - High population, can stunting crop
  - Young plants more susceptible
- Usually attacked by common predators & parasites

# Cotton Melon Aphid, *Aphis gossypii*

- Symptoms:
  - Curled and distorted leaves; possible viruses were transmitted so virus symptoms may be present.
- Control:
  - Promote existing natural control (predators, parasites, fungal attack);
  - plant carrots some distance away from melons and cotton.

# Carrot Rust Fly, Psila rosea

- Symptoms
  - tunneling or destruction of the tap root extremity by maggots.
- Control:
  - Adjust seeding dates; remove and destroy infested plants.

# Carrot Weevil, *Listronotus oregonensis*

- Symptoms:
  - zig-zag grooves and tunnels in root; plant wilts and dies.
- Control:
  - Promote existing natural control (predators, parasites, fungal attack);
  - remove infested plants from field;
  - use suitable crop rotation.

# Leaf Blight, *Alternaria dauci*

- Symptoms:
  - Infection begins as small, round spots with concentric rings within the lesion. Lesions can also be on petioles. Lesions enlarge and grow together causing a burned appearance.
  - leaves shrivel and appear to be burned.
  - Spores may be carried on seed.

# Leaf Blight, *Alternaria dauci*

- Control:
  - Keep fields well drained;
  - destroy crop residues;
  - practice suitable crop rotation, 2 years minimum;
  - treat seed with hot water 50°C for 15 minutes;
  - Plant pathogen-free seed
  - treat seed with Thiram, Vitavax or Captan (3g/Kg of seed) before sowing.
  - Chlorothalonil provides effective control

# Cercospora Leaf Blight, *Cercospora carotae*

- Small, irregular, black to purplish colored spots. Spots may coalesce to cover the entire leaf.
- Entire leaves and petioles may die on severely infected plants
- The symptoms first appear along the margins of the leaves, often causing the leaves to curl
- Lesions are tan and circular in shape with a dark definitive margin

# Physiological Disorders

- Cavity spot
  - Cause by Calcium deficiency,
  - Prevention, Maintain adequate Ca and moisture level in the soil
- Growth crack
  - Carrot root split along its length
  - Caused by soil moisture fluctuations throughout the growing season
  - Prevention, water the crop more regularly

# Harvesting and Handling

- Carrots harvesting depending on varieties,70-100 days after planting
- Most fresh market carrots are harvested *partially mature,* roots are 1.8 cm or larger in diameter at upper end
- For fresh-cut processing, carrots are harvested *immature* to insure they are tender and sweet.
- Harvesting
  - Light irrigate the field before harvesting
  - Dig on the bed with shovel, remove leaves before

# Immature Carrots

# Carrot Field - Batikot