



# Temperate Zone Pomology

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# Orchard Management Systems

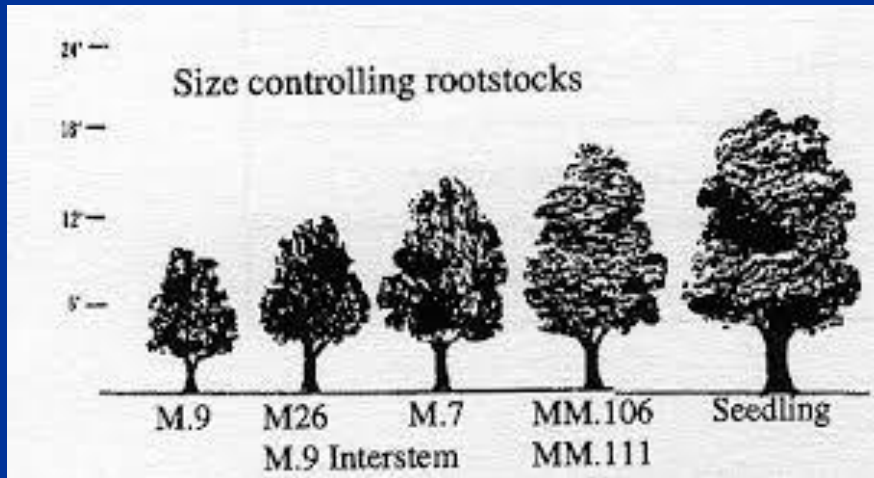
# Low Density Orchard

- Space ( $\sim 6 \times 6$ ,  $6 \times 7$ ;  $40\text{m}^2$ ;  $\sim 250$  trees per Hec.)
- Pruning
- Vigorous Rootstocks (Seedlings)
- Low Yield



# Medium Density Orchard

- Space ( $\sim 4 \times 5$ ;  $20\text{m}^2$ ;  $\sim 500$  trees per Hec.)
- Pruning
- Semi-Dwarf, Semi-Vigorous Rootstocks (MM106, M7)
- Better Yield



# High Density Orchard

- Space ( $\sim 3 \times 2.5$ ;  $8\text{m}^2$ ;  $\sim 1235$  trees per Hec.)
- Training and Pruning
- Dwarf Rootstocks (M9)
- The Best Yield





# **Orchard Floor Management (Soil Management)**

# Orchard Floor Management (Soil Management)

## Goals:

- Increase soil moisture availability
- Maintain soil structure and reduce soil erosion
- Improve soil organic matters
- Soil aeration
- Weed control
- Improve nutrient balance
- Facilitate movement in the orchard



# Orchard Floor Management Systems

- Clean cultivation
- Intercropping
- Cover crops
- Sod culture
- Mulching

No single orchard floor management system  
accomplishes all of goals

Considering the soil type, age of trees, slope, irrigation  
system and harvesting method

# Clean Cultivation

The inter space between the trees is kept clean by tillage and/or use herbicides



- Advantages:
  - Improves soil aeration and physical conditions
  - Controls weeds and thus reduces competition for light, nutrients and moisture
  - Eliminates or avoids alternate hosts for pests and diseases
  - Enhances biological activity in the soil through better aeration
- Advantages



# Intercropping

It is the practice of growing one or more short duration crops between inter-spaces of trees

## Advantages:

- It gives additional yield or income/unit area than sole cropping
- Higher productivity per unit area
- Maintain soil fertility
- Reduction in soil run-off

## Young Peach Orchard and Tomato as intercropping



## Young Peach Orchard and Bean as intercropping

# Cover crops

Growing some crops (clover, alfalfa, soybean) between inter-spaces of trees during year

## Advantages:

- N fixation (legumes)
- Soil C, N, and other nutrients
- Soil biology
- Soil and orchard temperature
- Increase fruit cleanliness/quality at harvest



# Sod Culture

Grasses are allowed to grow in the interspaces between the trees without tillage

The grasses are mowed periodically to reduce competition for water and nutrients with the trees

## Advantages:

- Controls soil erosion
- Maintains optimum soil moisture and organic matter
- Provides better aeration to the roots
- Enhances microbiological activity in the soil through better aeration
- Avoids bruising of falling fruits





# Mulching

Covering soil by organic or inorganic materials for maintain moisture and improve soil conditions

- Advantages:
  - Conserves soil moisture
  - Organic mulches add organic matter and nutrients thus save fertilizer requirements
  - Improves the soil structure, nutrient availability and micro flora
  - Controls soil erosion
  - Improves water infiltration and controls weed growth due to etiolation
  - Reduces soil temperature fluctuation
  - Mulch acts as a cushion for dropping fruits and thus avoiding physical injury
  - Growth, production, color and quality of fruits are improved



## Herbicide Damage to Trees

- Fruit trees can be damaged by herbicides if not used properly
- Injury can be local (affecting only the tissue directly hit by the spray), or it may be systemic.
- Systemic injury can produce symptoms some distance from the site of contact.
- Damage can also be related to the herbicide rate, tree vigor, and tree age as well as drought stress.

