Apple Tree Scientific name: Malus domestica Family: Rosaceae The apple is a deciduous tree, generally standing 2 to 4.5 m tall An apple is a sweet, edible fruit produced by an apple tree (Malus domestica). The tree originated in Central Asia. Apples have been grown for thousands of years in Asia and Europe. china, The United States, Turkey, France, Italy and Iran are leading apple exporters. Apple trees are large if grown from seed. Generally, apple cultivars are propagated by grafting onto rootstocks.

Bark on young trees is reddish grey with conspicuous pores (lenticels). Older bark is greyish-brown and scaly with thin, flaking plates.

•Apple has twigs with many short shoots bearing compact scars. Twigs are reddish-brown (young twigs have white woolly hairs) with small lateral buds pressed against the twig.

Apple varieties of which there are thousand fall into three broad classes:

1-cider varieties:

2- cooking varieties:

3-Desert varieties:

Apples are popular because they can be consumed in many ways: eaten fresh, or cooked, dried and in liquid form as juice and alcoholic cider.

Apples are a good nutritional source of dietary fiber, Vitamin C and A, a rich source of phenolics, High in carbohydrates, many varieties are relatively high in sugar.

The leaves alternately are simple, oval in shape, 4-10cm long, with small sharp teeth along the edges.

The undersides of the leaves are covered with grey hairs. In the fall, leaves turn yellow.

flower: Flowers are borne in clusters in early spring, with 5 white petals often flushed with pink. leaves and are produced on spurs and some long shoots.

• The fruit is a pome round that matures in late summer or autumn. and cultivars exist in a wide range of sizes. Commercial growers aim to produce an apple that is (7.0 to 8.3 cm) in diameter, due to market preference. The skin of ripe apples is generally red, yellow, green, and pink.

•The nature of bearing habit fruit terminally on spurs .

Among a huge number of cultivars more than 7,500 known cultivars of apple, commercial production is restricted to about ten important apple varieties, worldwide; these fruit bearing 'scions' are always grafted onto a genetically distinct rootstock. Cultivars vary in their yield and the ultimate size of the tree, even when grown on the same rootstock.

Most of commercial apple tree varieties thrive in cold and wet climate apple trees need a long, cold dormant period to prepare for the growth cycle. Abundant sunlight is necessary, as it significantly affects the color of the fruit Generally, the apple tree has greater needs in cold than most of other deciduous fruit trees.

• Most popular apple tree varieties thrive in regions where the temperature rarely increases above (32oC). Many apple farmers also make use of big fans in order to cool the apple orchard, when the temperature exceeds a certain point. Most of the apple varieties require 1.000-1.500 hours of chilling requirement

The apple tree can thrive in an average soil with PH close to 7 provided that is well drained and free from stagnated water. However, maximum yields are reported on fertile sandy loams with PH ranging from 6 to 7. we start by carefully plowing the field in depth of at least 20 inches(50cm)and we remove all the weeds.

Irrigation: The average young apple tree needs a lot of water in order to develop strong roots, leaves and finally fruits. As a first rule, young apple trees need more water than mature apple trees.

which can rely mostly on rainwater in regions with frequent rainfalls. As a second rule, in regions where there are no frequent rainfalls, it is beneficial to irrigate apple trees (especially the younger ones) about once a week from late spring to fall. As a third rule, the majority of apple trees need almost half of the annual water supply during summer.

Nitrogen and Potassium are very important for leaf growth, flowering and fruit set, while Phosphorus is crucial for the development of a strong root system especially at the early stages of plant development.

• Calcium, Magnesium, Manganese, Zinc and Boron are also important for various stages of bud development, flowering and fruition and any deficiency will have a negative effect in fruit number, quality and general tree health.

Pollination

Apples are self-incompatible, they need cross-pollinate to develop fruit.

During the flowering each season, apple growers often utilize pollinators to carry pollen.

Honey bees are most commonly used.

Group A – Early flowering, 1 to 3 May in England ('Gravenstein', 'Red Astrachan')

•Group B – 4 to 7 May ('Idared', 'McIntosh')

•Group C – Mid-season flowering, 8 to 11 May ('Granny Smith', 'Cox's zOrange Pippin')

•Group D – Mid/late season flowering, 12 to 15 May ('Golden Delicious', 'Calville blanc d'hiver')

•Group E – Late flowering, 16 to 18 May ('Braeburn', 'Reinette d'Orléans')

•Group F – 19 to 23 May ('Suntan')

•Group H – 24 to 28 May ('Court-Pendu Gris' – also called Court-Pendu plat)

•One cultivar can be pollinated by a compatible cultivar from the same group or close (A with A, or A with B, but not A with C or D).

Training and Pruning

•are essential practices for maintaining a healthy and productive apple tree.

Training is the removal parts of the young plants to get a suitable or desirable shape with strong framework capable of bearing a heavy crop load.

training done primarily on young trees (first 4-5 years) to establish a strong structure for future growth and fruit production.

Aims to develop a central leader (main trunk) with well-spaced branches for optimal light penetration.

Objectives of training:

1- To admit more light and air to the center of the tree. 2. To facilitate orchard cultural operations such spraying and harvesting.

3-To provide an attractive appearance.

4-To secure a balanced distribution of fruit bearing parts on the main limbs of the plant.

Pruning:

Pruning is defined as the removal of any excess or undesirable branches, shoots or any other parts of a plant so as to allow the remaining parts to grow normally.

Performed throughout the life of the tree, but most heavily during the dormant season (late winter/early spring).

Objectives of Pruning:

1-To remove the non-productive parts.

2-To remove diseased, dried and broken branches.

3-To control the size of the plant.

Fruit Thinning

•Fruit Thinning is a fundamental technique in which producers remove a significant number of small, non-uniformed, or defective fruits from the tree to let the tree redirect its fruits of higher quality Thinning is mainly done manually, either by removing flowers-fruits or by pruning some fruit-bearing branches. Some producers also apply chemical thinning .

•Before harvesting apples, we have to “thin” the trees. Apple tree thinning is crucial in order to have a good yield and normalize the production throughout the years (minimize the phenomenon of Biennial Bearing). Apple tree thinning takes place from late spring to summer (April to July).

• benefits of thinning fruit:

1.Improve remaining fruit size color, quility

2.Help to avoid limb damage from a heavy fruit load.

Maturity indices and Harvesting

•In order to determine the maturity of fruit and the appropriate harvest dates.

•Maturity indices have been developed and these are:

1.Days from full bloom to harvesting.

2. External fruit color .

3. Flesh firmness.

4. Starch, sugar, or acid content.

•For the longest storage life with optimum eating quality, apples should be harvested in maturation stage

Harvesting

•Apple harvesting typically occurs in the fall, from September to October in the Northern Hemisphere. However, the exact timing can vary depending on the specific apple variety and climate conditions.

Storage

Commercially apples can be stored for some months in-controlled atmosphere chamber , apple store (below 5 0c) 1-4 0c.