Deciduous fruits and nuts considered in this chapter are cultivated trees that shed their leaves in the fall. Of these the most important fruit crops are apples (Malus sylvestris), apricots (Prunus armeniaca), cherries (Prunus sp.), figs (Ficus carica), peaches (Prunus persica), pears (Pyrus communis), plums (Prunus sp.), and prunes (Prunus domestica). Important nut crops are almonds (Prunus amygdalus), filberts (Corylus avellana), pecans (Carya illinoensis), and walnuts (Juglans regia).

All of these crops are grown mainly in the temperate zones. All require a period of dormancy to grow and produce well, hence they are not successful in the tropics. Most are grown between 25° and 55° latitude, both north and south of the equator.

Within these temperate zone regions, annual precipitation varies from < 5 inches/year, as in certain areas of north-Africa and Southwest USA, to areas > 100 inches. In general, irrigation of orchards is essential for commercial production of these crops where annual precipitation is < 20 inches. Some supplementary irrigation is needed where precipitation is between 20 and 30 inches while irrigation is rarely used in areas of > 30 to 35 inches precipitation.

Since these deciduous trees are without leaves during the winter months, they use very little water during that time. In the Northern Hemisphere the period without leaves will extend from October to May in northern areas and from late November to April in more southern areas. Precipitation occurring in these periods will be stored in the soil, if the soil is sufficiently deep and retains water. Thus the depth of soil and its water-holding capacity are very important in determining the need for irrigation in areas where total precipitation may be ample but where distribution of rainfall is erratic and uncertain.

I. ROOT SYSTEMS OF DECIDUOUS FRUIT AND NUT TREES

Trees develop very extensive root systems when grown in deep, well-drained soil, free of impervious layers or high water tables. Proebsting (1943) reported apricot roots 16 ft deep in a well-drained soil in California, USA. Veihmeyer and Hendrickson (1938), on the basis of water-extraction studies in well-drained soil, concluded that walnuts had numerous roots at a depth of 12 ft and peaches and prunes at 6 ft, the maximum depths studied. Wiggans (1936) found apple roots 30 to 35 ft deep in the loess soil of Nebraska, USA.