University of California Cooperative Extension
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Low-Chill Apples

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Introduction: The apple (*Malus domestica*) is a member of Rosaceae, the rose family. It is older in cultivation than the rose and is sometimes referred to as the prince of the rose family. It presents many of the extremes in color, size, fragrance and plant character of its rose cousin plus an important added benefit—flavor!
One can find apples to suit nearly every taste and cultural demand. With attention to variety selection apples can be grown successfully in Southern California.

Low-Chill Apple Varieties: There are 8,000-plus apple varieties worldwide with new ones introduced annually. Apple varieties exhibit considerable genetic diversity. Some varieties have several strains, each with its own characteristics. Spur-type (short shoot growth and abundant spur production) varieties do poorly on dwarfing rootstocks; they are best grown on seedling rootstock. Some require as few as 70 days to mature; others take 180 days or more. For optimum production, most apple varieties require cross-pollination from another variety that blooms at the same time and produces abundant, viable pollen. Many varieties are self-unfruitful and have sterile pollen; others are partially self-fruitful (not all of their pollen is viable); a few are self-fruitful.

Winter chilling requirements for most varieties are 500 to 1000 hr. below 45° F (7° C). There are relatively few varieties adapted to mild winter climates (chill hours below 500) like those in non-mountainous areas of Southern California. However, home growers in these areas still have a remarkable selection of fine quality, tried-and-true varieties since low-chill varieties are available that need no more than about 300 hr. below 45° F. To ensure successful apple production in mild winter zones of Southern California, select from the following varieties that need less than 300 hr. of chilling: Beverly Hills, Gordon, Tropical Beauty, Anna, Dorsett Golden, and Ein Shemer. Gala has recently proven itself in Southern California except for the lowest chill areas near the coast.

Recent U.C. variety evaluations in Irvine, CA. determined that the best flavored apples were Fuji, Anna, and Gala. Gala was superb. The most vigorous growers were Pink Lady, Gala, and Jonagold. Greatest fruit number and total weight per tree were Anna, Dorsett, Granny Smith, and Braeburn..

Of the Southern California favorites, Anna, Dorsett Golden and Ein Shemer have performed well in areas that receive little or no winter chill, including the low desert. Knowledgeable apple growers are incredulous when they see thriving Anna apple trees with firm, pretty, delicious fruit in places like Thermal, CA. Anna has a sweet flavor similar to Red Delicious; Dorsett Golden has a flavor similar to Golden Delicious. Ein Shemer needs no chill at all and sets heavy crops of small, mildly sweet, flavorful apples. Gordon, discovered in Whittier, CA, is a proven variety for Southern California, having chill needs similar to Gala.

There are also antique varieties adapted to warm winter climates. Pettingill, Yellow Bellflower and Winter Banana along with the hardy White Winter Pearmain are all long-time favorites of Southern California apple hobbyists. Each of these antique apples has a unique, indescribable flavor that has made it a perpetual favorite. Pettingill, discovered in Long Beach, CA in 1949, at one time was the #1 apple planted in Southern California.

History: The world's biggest collection of apple cultivars is housed at the National Fruit Collection in England. As noted earlier, most apples have a winter chilling requirement in order to produce flowers. Thus, different cultivars are available for temperate (high winter chilling hours) versus subtropical (low winter chilling hours) climates. Apples do not flower in tropical climate areas except in high elevations because of this chilling requirement.

Commercially popular apple cultivars are soft but crisp. Other desired qualities in modern commercial apple breeding are a colorful skin, absence of russeting, ease of shipping, lengthy storage ability, high yields, disease resistance, typical 'Red Delicious' apple shape, long stem (to allow pesticides to penetrate the top of the fruit), and popular flavor.

Old cultivars are often oddly shaped, russeted, and have a variety of textures and colors. Many of them have excellent flavor (often better than most modern cultivars), but may have other problems which make them commercially unviable, such as low yield, disease, or poor tolerance for storage or transport. A few old cultivars are still produced on a large scale, but many have been kept alive by home gardeners and farmers that sell directly to local markets. Many unusual and locally important cultivars with their own unique taste and appearance are out there to discover; apple conservation campaigns have sprung up around the world to preserve such local cultivars from extinction. Although most cultivars are bred for eating fresh (dessert apples), some are cultivated specifically for cooking (cooking apples) or producing cider. Cider apples are typically too tart and astringent to eat fresh, but they give the beverage a rich flavor that dessert apples cannot.

Modern apples are, as a rule, sweeter than older cultivars. Most North Americans and Europeans favor sweet, subacid apples, but tart apples have a strong minority following. Extremely sweet apples with barely any acid flavor are popular in Asia and especially India.

Tastes in apples vary from one person to another and change continually over time. As an example, the U.S. state of Washington made its reputation for apple growing on Red Delicious. In recent years, many apple connoisseurs have come to regard the Red Delicious as inferior to cultivars such as Fuji and Gala due to its mild flavor and insufficient firm texture.

Planting: It is best to plant an apple tree in a location where it will receive full sun and have good drainage. The ideal planting time for fruit or nut trees is during the dormancy period of January to March in the bare-root stage. Plant bare-root plants as soon as possible after receiving them from the nursery, and do not let the roots dry out. The roots are very sensitive and must be kept moist and protected from harsh temperatures.

General Care: Maintaining a good fertilization program can keep your plants vigorous and help minimize certain pest problems. Nitrogen and zinc are two of the most important nutrients to supply apple trees. Fertilizing twice per year, once in the spring and again in the fall, will keep an apple tree very vigorous.

Pruning in the first year is important to shape the tree and make it grow strong and healthy. Pruning out the center branches can keep the tree from growing too tall.

Keep the tree well watered. Water stress in the first couple of years can cause the tree to become stunted and susceptible to boring insects. It is best to keep the soil moisture even and water the tree deeply to maintain a strong root system. Cool temperatures and bright sunshine during final ripening are usually needed for optimum coloration in most red varieties.

For more information on growing fruit trees in temperate climates see this article at:
http://homeorchard.ucdavis.edu/plant_apple.pdf

Pests and Diseases: Some apple varieties have a tendency to develop the surface cosmetic blemish on the fruit known as russeting. This condition is enhanced by foggy days and dew.

Check with this site for a complete list of pest and diseases:
http://www.ipm.ucdavis.edu/PMG/GARDEN/FRUIT/apples.html

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