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ROSES FOR THE ARIZONA HOME

Perpetual or everblooming roses are better adapted to our wide range of growing conditions than any other class of cut flowers we have. Their long blooming season and splendid flowers make them very popular. Except at the higher altitudes, the canes of even tea roses are not injured with winter temperatures. With proper culture roses suffer little injury from extreme heat and aridity, though in the hotter valleys their growth is checked during June and July. At this season they may be given a short resting period by partly withholding irrigation and cultivation, though they should never be allowed to suffer for want of water. Roses flower in Arizona during the spring and early summer and again in autumn, often as late as November and December. In planting roses one should set at least two plants of a kind to insure enough flowers at one time for a bouquet. Interest in roses is greatly increased by keeping a list of varieties planted and studying these as they bloom. The flowers should be cut as the buds begin to open, preferably in the early morning.

Perpetual or everblooming roses. These roses are grown for cut flowers, as climbers, and occasionally as ornamental shrubs. They have been classified into several groups, according to their origin and characters. Rose specialists, however, are not always agreed as to which group a rose belongs, since these are closely related through long continued hybridization. The more important of these classes or groups of roses are tea roses, hybrid teas, hybrid perpetuals, dwarf ramblers, Noisettes, and China or Bengal roses.

Tea roses have ascending canes with rather stout prickles and smooth, slightly glossy leaves. The flowers are rounded and usually slow to come into full bloom, they are medium sized and tea-scented, often with large thick petals. Commonly, the bases of the petals are yellowish tinted and the pink or rose color is not solid.

The prevailing colors for tea roses are light yellow or copper-colored to nearly white, pink or rose. They are nearly constant bloomers but are rather tender for altitudes above 5,500 feet. They have not been injured here with temperatures of 6° P. They do best in warm, sandy loam soil with good drainage.

A number of tea roses have succeeded well in southern Arizona with care. Among these are the following: *The Bride*, flowers large, white, with blush-edged petals; *White Maman Cochet*, flowers similar, but light cream at the center; *Duchesse de Brabant*, flowers rather small, continuous, light rose; *Cocheurinc Mermet*, flowers large, double, pink, stems long; *Devoniensis*, flowers cream-white, rose center, large, fragrant; *Maman Cochet*, buds long pointed, flowers delicate, silvery pink; *Papa Gontier*, buds fine, opening quickly, flowers large, half-double, cherry red; *Homci*, flowers full, medium sized, white tinged with pink, slow to open.

Hybrid tea roses have ascending or nearly erect canes which are usually stouter than those of tea roses; the leaves are slightly wrinkled and scarcely glossy. The flowers are larger than those of tea roses, fragrant, but not tea-scented, usually rounded in form and from half to very double. There is the widest range in color from white or cream-white to yellow, pink, salmon, rose, red, and deep red. Hybrid tea roses are hardier than tea roses and bloom about as constantly. Many of the finest roses we grow belong to this class. Of the number under observation, the following are recommended because of their good growth and flowers: *Kaiserin Augusta Victoria*, flowers large, fragrant, with thick ivory-white petals; *Madame Abel Chatenay*, buds long pointed, flowers silvery salmon; *Sunburst*, flowers large, orange and yellow, stems long; *Radiance* and *Madame Caroline Testout*, flowers large, double, rose pink lasting well, *Madame Segund Weber*, buds long-pointed, flowers large, flesh-pink, becoming deeper; constant bloomer; *Etoile de France*, flowers large, double, deep crimson red; *Crimson Queen*, flowers large, full, bright velvety crimson; *Gruss an Teplitz*, flowers medium size, less double, bright scarlet, abundant. Gruss an Teplitz is usually classed as a hybrid tea, but regarded by many as a hybrid China rose; its foliage is bronze green, smooth, glossy and persistent. It is hardy and adapted to a wide range of conditions and uses.

Hybrid perpetual roses have rather stout, usually erect canes, with fewer and smaller prickles. The leaves are deep green, not glossy, rather thick and somewhat wrinkled. The flowers are large and flattish. The prevailing colors are light pink, rose, red and maroon. The flower stems are stiff and quite long. Hybrid perpetuals are among the hardiest of the everblooming roses and with the hybrid teas are well suited for growing over the State. They are not as free bloomers as hybrid teas or tea roses, but are hardier. The varieties mentioned below have proved very satisfactory under our conditions: *Frau Karl Druschki* (White American Beauty), flowers large, pure white, opening quickly; *Margaret Dickson*, flowers large double, white tinged with pink, set among the leaves; this and the

preceding are shy bloomers; *Mrs. John Laing*, flowers large, double, clear silvery pink; *Captain Christy*, flowers large, light pink, fading to nearly white; *American Beauty*, flowers deep rose, a regular bloomer and too well known to need description; *General Jacqueminot*, flowers brilliant crimson red, mostly in spring.

Dwarf Ramblers (Polyantha roses) are low plants with a compact habit of growth and many small blooms in clusters. They are very free bloomers and as hardy as hybrid perpetuate. They are sometimes grown as pot plants. *Mlle. Cecile Brunner*, with small flowers, rose-pink with a cream white background, and *Perle d'Or* with flowers coppery gold changing to fawn, are good representatives.

China or Bengal roses are hardy and bloom quite continuously. Their canes are usually slender, smooth and nearly free from prickles. The leaves are large, glossy, evergreen and somewhat bronze colored. The flowers are fragrant, rather small, and dark red, becoming darker. China roses are grown little now, though they are worthy of a place in gardens for hedges and as ornamental shrubs. *Agrippina* roses on the University grounds, 20 years old, are still thrifty and bear well. *Gloire des Rosomanes* or "Ragged Robin" is a type of the Bourbon roses. It is hardy and makes strong growth with ordinary conditions. It blooms throughout the growing season and produces a wealth of half-double, crimson-red flowers which open quickly but do not last well. Neither China nor Bourbon roses are good for cut flowers.

Climbing everblooming roses: Our choicest climbing roses are sports of everblooming varieties, including teas, hybrid teas, hybrid perpetuals, and Noisettes, thus combining the qualities of climbing and free blooming. Climbing roses are stronger growers than ordinary roses and hence require deep rich soil with abundant irrigation. Usually, their foliage is not as dense as that of other climbing plants and they should not be planted where dense shade is wanted. The flowers of the red-flowered forms scald with the hot afternoon sun, and hence such climbers should be planted on the east or north sides of houses. The foliage of these climbers is not injured with our highest temperatures.

Of the tea roses and hybrid Noisettes resembling teas, *Lamarque* and climbing *Papa Gontier* are recommended. *Lamarque* is one of the hardiest and most successful of our climbing roses. It bears a profusion of double, white, fragrant flowers in the spring and a considerable number of flowers in summer. The flowers resemble tea roses, but the foliage is of the Noisette type. Plants on the University grounds 20 years old are still thrifty. Climbing *Papa Gontier* is the strongest grower and most desirable of the deep red tea roses. It should be budded and grows well on a western exposure, but the blossoms are injured with high temperatures.

The climbing hybrid tea roses are represented by climbing *Kaiserin Augusta Victoria*, *Caroline Testout* and climbing *Wootton*. The *Kaiserin* is the most superb of the white climbing roses, though not as hardy as *Lamarque*. The flowers are identical with those

of the bush plant. Climbing Caroline Testout has large, globular, very double, clear pink flowers. It is not a heavy bloomer nor as strong a grower as the climbing Wootton which bears a profusion of half-double bright magenta flowers in spring and after that occasional flowers in summer.

The climbing form of *Mlle. Cecile Brunner*, a rambler rose, is very pleasing, because of the wealth of pink-white flowers produced most of the season. The plant is hardy. *Dorothy Perkins* is also hardy and vigorous and bears dense clusters of shell pink flowers which last well. This is splendid for training over arches. Other rambler roses grown especially in the northern part of Arizona are *Crimson Rambler* and *Tausendschon*. These are hardy, though subject to mildew, even in our dry climate. The ramblers bear flowers in clusters, the *Crimson Rambler* has crimson red flowers and *Tausendschon* pink or whitish flowers.

There are still other climbing roses that bloom only in the spring. These include the *Banksias*, *Cherokee* roses and the well known *Gold of Ophir*. The *Banksias* are all climbers with dense foliage. The flowers are small, double, white or yellow and borne in clusters. The canes are slender, without prickles and with small leaves. The *Cherokees* are similar to the *Banksia* roses. Their flowers are also borne in clusters and are small, single or double, and white, pink or red. The foliage is glossy and evergreen and the canes are slender and smooth. *Cherokees* are hardy and thrive with ordinary conditions. They are fine for hedges, arbors, fences and growing over banks. *Gold of Ophir* is a splendid, hardy, climbing or half-climbing Noisette rose. It bears masses of yellow flowers tinged with coppery red and requires little care for good growth. None of these roses should be pruned severely and all are hardy at temperatures of 6° F.

Soil requirements: Roses delight generally in heavy loam or clay loam soils with good drainage and aeration. Clay soils are mostly too heavy for their best growth, while sandy soils are too light and do not contain enough plant food. They are heavy feeders and require rich soils, regular irrigation and fertilization. In planting, dig holes to a depth of 2 or 3 feet and as wide and fill with a mixture of finely divided and well-rotted cow or sheep manure and soil, in the proportion of one part of manure to about six parts of soil. This should be done, if possible, some time before planting, and the manure must not come in contact with the roots of newly set plants. Where the soil is shallow and underlaid with hardpan or caliche, dig or blast with dynamite full sized holes deep enough to insure drainage. Trenches should be dug 4 or 4½ feet wide. Where there is danger of poor drainage through caliche or hardpan, fill the bottom of the hole or trench to a depth of 6 inches or so with tin cans, cobble stones or old bricks. On top of this put a good layer of prunings from trees and shrubs, lawn clippings, wood chips, or similar rubbish from the yard. If the soil is inclined to be heavy or clayey in character, mix loose organic matter of this sort throughout in addition to the manure. This insures drainage and prevents the soil from becoming too compact. After the trenches have been

filled and the soil settled with a heavy irrigation set the roses in a double row, alternating with one another, on both sides of a small irrigating ditch, 12 or 15 inches from the outer edges of the trench and $2\frac{1}{2}$ to 3 feet distant between plants. The soil in the holes or trenches when settled should be about 6 inches below the level of the ground to assist in irrigation and to collect storm water. The deep, rich soils of our agricultural valleys need not be prepared as described above, as these are usually well supplied with plant food. With the above suggestions proper soil can be supplied for roses even where the native soil is sandy, gravelly, heavy adobe, underlaid with hardpan or caliche or otherwise unsuited for growing roses. Cow manure is cheaper and better for roses than perhaps any other fertilizer we can purchase.

When to plant roses: For southern Arizonan conditions plant roses early, i. e., from December 15 to February, and not later than the first week in March. Late planted roses rarely do well. For altitudes of 5,000 or 6,000 feet plant roses in March, which is at least a month before they begin growth. Some years ago the writer planted 4 roses on the first of each month from December to April, inclusive. The plants set in December and January blossomed late the following spring, and made about as good growth during the season as those which had been set out one year. Those plants that were set out in April made poor growth and most of them died during the summer. In connection with this experiment, it was noted that the young roots of roses were making considerable growth in December and January when the plants are supposed to be dormant. The young plants should be set at this season so as to become established before the hot weather begins.

How to plant roses: Purchase strong, one-year-old field plants, preferably from home or near-by nurseries. If shipped, have them come by express and well packed so that the roots will not dry out in transit. Upon receipt of the plants set them in a vessel of cold water with the roots well covered for one or two hours, or longer if the tops show signs of shriveling. Cut back the tops to 10 inches if this has not been done already, and remove with clean cuts any injured or broken roots. If the stems are badly shriveled, the plants may be buried in wet soil in a shady place for 2 or 3 days and then planted out. Set the plants about 3 feet apart in the bed, and slightly deeper than they grow in the nursery row. Spread the roots out well in the hole, pack finely pulverized soil firmly about them, and irrigate immediately to settle the soil and prevent the roots from drying out. Examine the soil the following day to see that it has not cracked or settled away from the plants as a result of irrigation. Do not expose the roots to the air any longer than is necessary. Budded roses should be set 3 inches below the union of stock and scion to discourage the stock from sending up shoots from the base.

Care of roses: Keep the soil moist about newly-set roses to encourage a rapid growth of the young roots. If the plants were set out late, apply a good heavy mulch to keep the soil cooler. It is sufficient to irrigate newly-set plants every 4 or 5 days. Plant roses

by themselves in beds or in a rose garden which has an exposure to direct sunlight at least one-half of each day. The north side of a house in a small yard is not as favorable as an eastern or western exposure, since the plants will get little or no direct sunlight during the late fall and winter months. A southern exposure is perhaps the best as the plants have sunlight throughout the year. Protect the rose garden by hedges, fences, or other means from strong winds, as these damage the delicate buds, flowers, and foliage. Roses will not grow well in a grass sod, and besides they give a lawn an untidy appearance. They should have clean and regular cultivation throughout their growing season. The soil should be loosened once every month with a hoe fork to stimulate vigorous growth.

In southern Arizona, where the summers are hot, the air dry, and evaporation is brisk, the rose garden should be irrigated once in 7 or 8 days. At altitudes of 5,000 feet or higher, with proper culture, it is sufficient, ordinarily, to irrigate roses once in 10 or 12 days. It is an excellent practice to mulch the rose garden during the summer. This may consist of wood chips, lawn clippings, or, better, rotted cow manure. A mulch makes less cultivation necessary, prevents an excess of evaporation and also keeps the soil cooler. Cover the rose garden with a heavy application of cow manure in the fall and remove any excess of this in the spring and spade under the remainder to a depth of 6 or more inches with a garden fork, but not deep enough to disturb the roots of the plants. Where the winter rains are not heavy, which is usually the case in the Southwest, water the rose garden heavily with a sprinkler once in three or four weeks. This will assist in carrying down into the soil the soluble fertilizing material from the manure, and keep the plants in good growing condition. The secret of successful rose growing in Arizona is good culture. A dozen roses well planted and cared for will produce more and better flowers than twice that number with just ordinary care. *

Pruning eve? blooming roses: Rose flowers are borne on new wood of the season that grows from the canes or from crowns of the plants. Pruning influences very materially the number, size, and quality of the flowers, as well as the growth and vigor of the plant. Prune during the winter season or in early spring before the buds begin to swell. At the lower altitudes in our State the month of January is a good time, but if one desires to use the cuttings for planting the pruning may be done in December. In all cases cut out weak, crooked or crossing branches and reduce the number of stout canes to 5 or 6 in young plants and 10 or 12 in older ones. Some planters allow one cane for each year of age of the plant. Strive to keep as much new wood as possible in the base of the plant. Hybrid perpetual roses are mostly pruned closer than those of other groups. They are vigorous growers and their canes may be cut back to within 12 or 14 inches of the ground. Make the cut about one-fourth inch above an outside bud of the cane to encourage the development of an open head for the plant. This secures more room for the growth of the flower-bearing stems. The closer the pruning the

more vigorous will be the growth of the plant, and the finer the flowers. Where the canes are cut to 18 inches the flowers are abundant but smaller and with shorter stems.

Hybrid tea roses are pruned similarly to hybrid perpetuals, but they are cut back rather less severely. About one-half the length of the canes are cut off, the weak or crooked ones are removed, and the number of good ones reduced as before. Tea roses are cut back less than hybrid tea roses, since normally their flowers are smaller and there is less desire to grow large or oversize flowers. A heavy pruning may be necessary occasionally to rejuvenate the plants. In cutting flowers from any of the perpetual blooming roses and in removing old flower stems, cut back far enough to leave only two or three strong buds at the base of the flower stem for further growth. This prevents the bushes from getting "twiggy" and helps to keep them in healthy condition. There is always a temptation to leave too much wood on rose bushes. The flower buds on a shoot should be reduced to three, two, or one for choice flowers.

Propagation from layering and cuttings Most people prefer to buy rose plants, but they may be grown. Layering, which is too common to need description, is one means of doing this. Roses can be grown from cuttings made 8 or 9 inches long. Cut these in December and bury in moist sand with the tip ends down. The sand must have drainage and be kept moist. In the early spring set out these cuttings, in garden soil and give good culture. Mulch with straw to protect them from sudden drying out and also the hot sun. Good plants may be grown in this way which will be ready for permanent planting the following winter or spring.

The above applies to own-root roses and generally these are best for the beginner. Own-root roses are sometimes not as vigorous as budded roses. Budded roses must be watched constantly to see that the stock does not send up shoots that will choke out or rob the budded part of the plant of its vigor. The beginner often has difficulty to distinguish between the shoots of the stock and those of the scion, and so both are left to grow.

Propagation by budding Roses are mostly budded on Manetti or sweet briar stocks, though any hardy rose that grows easily from cuttings, does not spread from its roots, and buds readily will answer. One can bud whenever the bark slips readily, usually from June to October. To bud, make a vertical cut about an inch long in the cane at the ground and from the top of this make another at right angles, so as to form a "T" shaped cut. Loosen the flaps of bark thus made and insert a shield bud of the variety of rose desired under these and push this down gently as far as possible. Press the flaps back now and wrap a piece of white cord several times about them and tie to hold them snugly in place. Remove this cord when the bud begins growth and cut off the cane just above the bud. In this work do not injure the growing bud. Cut the shield bud with a sharp knife, preferably a budding knife, to include almost no wood from below but with enough bark to make it oblong in form and

about one-fourth inch wide and one-half inch long. Cut off the leaf at the base of the bud so as to leave its stalk one-half inch long, and use this as a handle in pushing the shield bud to its place in the stock.

Rose troubles. The leaf-cutter bee is a common, though usually not serious, pest of roses and similar plants. This insect cuts out small circles from the leaflets, which spoils the appearance of the foliage and retards the growth of the plants. Unfortunately, no remedy can be suggested.

Rose thrips, also, are troublesome pests that as yet have not been controlled. They are very small insects living in the flowers. When abundant they cause imperfections in the buds which often do not open well. Thrips are held in check somewhat by cutting the flower buds as soon as they begin to open and also by removing undesirable or damaged flower buds as fast as they appear. Only such buds should be left on the plant as give promise of developing into good flowers.

For treatment of the rose aphid and the rose mildew see Timely Hint No. 99, Arizona Agricultural Experiment Station.

Chlorosis is an abnormal or diseased condition of rose bushes. It is prevalent in poorly drained soils and most pronounced in mid-summer. Diseased plants have smaller leaves than normal, and these are yellow or light yellowish in color and scald badly in summer. The flowers are few, small and imperfect. The plants stop growth and have a sickly appearance. Chlorosis appears to be due to a diseased condition of the roots and may result from various causes, all of which arise, directly or indirectly, from unfavorable soil conditions. Among these causes are large amounts of alkali, fresh manure, or an excess of old manure in the soil, bad drainage and aeration, over-irrigation, lack of cultivation, and shallow, sterile soils, particularly when underlaid with hardpan or caliche. The writer was troubled with this disease for several years. The plants did well for a season or two after which they would turn yellow, cease growth and die slowly. Heavy irrigation and applications of liquid manure intensified the disease, while if water was withheld the plants suffered from drought. The soil was shallow—about 15 inches deep—and underlaid with the usual, nearly impervious caliche, so that there was poor drainage and aeration. Four years ago the top layer of this soil was removed and the caliche dug out to a depth of 4 feet into a porous layer. This was done over an area of 16 feet on a side and the hole was filled with a mixture of mesa soil, well-rotted manure and other miscellaneous organic matter. Healthy roses of the same varieties that had failed previously were set out and have made fine growth. The trouble was bad drainage.

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