Evaluation of Date Cultivars for Dessert Quality

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The date, *Phoenix dactylifera* L., is one of the most ancient fruit crops used by man; records of its culture date back nearly 5,000 years. Hundreds of individual palms have had sufficiently favorable attributes to attract the attention of cultivators and have received names. Only a small number of these cultivars, perhaps less than 200, have been imported to this country, beginning about the turn of this century. These imports represent the cultivars most highly regarded by cultivators in the Old World and those selected by European horticulturists who visited and studied date cultivars throughout their range of cultivation. Many cultivars failed to live up to the reputations acquired in their homeland or had serious horticultural—and U.S.—market shortcomings.

Date cultivars that are fully mature and grown under normal conditions in a favorable climate are generally placed into three categories by flesh consistency: soft, semidry, or dry. U.S. consumers are familiar with soft types, slightly familiar with semidry types, and almost completely unfamiliar with dry-type dates. The 'Deglet Noor' cultivar, which accounts for at least 85% of domestic production is considered to be semidry, but after the usual commercial processing, it reaches the consumer as a soft-type date product. Almost all imported dates are derived from soft-type cultivars or reach the consumer as a soft-type date product.

Flavor, consistency, and appearance are the most important components of sensory appreciation in dates. The intricate and subtle ways in which these components are combined in a cultivar largely determine the esthetic pleasure derived in eating the fruit. Nutritional attributes are an important part of quality in dates, but they have no obvious relationship to sensory appreciation and are not discussed in this article. Dates available in general food markets are of such quality that it may be difficult for a consumer to really appreciate that some cultivars of dates can be used for a superlative dessert. Commonly available dates, whether domestic or imported, are characteristically soft, sticky, and often of mediocre dessert quality, but are quite satisfactory for cooking. High-quality dessert dates generally are obtainable from local growers only, markets in the Coachella Valley, or a few specialists who market dates by mail order.

Unfortunately for consumers who appreciate high-quality dessert fruit, the date has suffered from the same "improvement" syndrome that has been a major factor in lowering the quality of many other foods. Two of the most obvious examples of this type of improvement in fruits are the resurrection by hydration of late-harvested, dried-out 'Deglet Noor' dates to obtain a chewable product and the treatment of 'Thompson Seedless' grapes with gibberellic acid to increase berry size. In both instances, varieties with very high potential dessert quality have, under one pretext or another, undergone changes that have resulted in a mediocre product.

The following comments on quality in date cultivars represent my evaluation of this important characteristic in germplasm available to the USDA date-breeding program. The fruits of the cultivars are discussed in approxi-

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mate order of merit as dessert fruit and illustrated in Figure 1.

Deglet Noor. This is one of the oldest cultivars of which details of its origin are known. It originated in an oasis near Tougourt, Algeria, just after the turn of the 17th century, or about 370 years ago. The name, of Arabic derivation, is said to mean "date of the light" or "the transparent date," because the outline of the seed is visible when the fruit is held up to the light. A properly grown 'Deglet Noor' is probably the world's finest quality date. As such, it would have to be included in any epicurean list of fruits along with the 'Black Monukka' grape, 'Doyenne du Comice' pear, 'Cox's Orange' apple, and 'Suwanee' strawberry. The fruit is medium to medium large, oblong-ovate, and translucent light brown, with a semidry, amber flesh of exquisite flavor. To me, 'Deglet Noor' has a flavor and sweetness reminiscent of pralines or brown sugar and is never cloying, despite its richness, in contrast to most date clones which are merely sweet, cloying, and undistinguished in flavor. 'Deglet Noor' holds its fruit shape; the skin surface is generally dry and not "weepy" with syrup, as in many soft-date types. Unfortunately, this cultivar is quite sensitive to soil, climate, and mishandling in harvest and may become dry, tough, and mediocre in flavor. The season of maturity is medium-late.

'Kush Zebda'. The 'Kush Zebda' is a comparatively rare and little-known cultivar that originated in Arabia. The name is said to mean "butter date." The fruit is small, ovate, and chestnut brown, with a soft, rich, buttery-flavored flesh of superb quality. It matures at midseason. 'Kush Zebda' may often look unattractive, because its skin is very susceptible to checking from high humidity and rain.

'Dayri'. The name of this cultivar is said to mean "monastery date" and was acquired from its having originated in Iraq near a monastery. 'Dayri' is a large, oblong, midseason, semidry date of dark, reddish brown to nearly black color, with a lighter colored bloom. It is very sensitive to factors affecting maturity, and, like 'Deglet Noor', the excessively dry fruits are deficient in flavor and quality. When well grown, 'Dayri' has a semidry to slightly soft flesh with a very rich, distinctive flavor and excellent quality.

'Empress'. This cultivar originated from open-pollinated seed of 'Thoory', planted about 1916 by Mr. Davall near Cathedral City, California. 'Empress' has a large, oblong fruit of a light-to-medium chestnut color, with a moderately soft, rich-flavored flesh of high quality. The fruit matures in midseason. 'Empress' is probably the highest quality date that has originated from the many seedling dates grown in the southwestern U.S.

'Barhee'. The 'Barhee' cultivar originated in Iraq, and the name, of uncertain meaning, is supposedly connected in some manner with the hot summer winds at Basra, Iraq, and the date's maturity. However, 'Barhee' is a late-maturing variety. The fruit is small and short-ovate, with a very smooth, caramel-like flesh and a rich, delicate flavor. The skin tends to separate from the flesh (an undesirable trait) and, depending on the degree of separation, ranges from amber to reddish brown. 'Barhee' tends to lose its delicate flavor fairly rapidly in storage.

'Halawy'. The 'Halawy' cultivar originated in Iraq and is said to mean "sweet." The fruit is below medium in size, slender-oblong, translucent golden brown, and very wrinkled. 'Halawy' has a distinctive, very rich, sweet flavor and a soft, caramel-like flesh of fine quality. Its fruits are ex-

Fig. 1. Fruit of dessert date cultivars. Top row (left to right): 'Amir Hajj', 'Empress', 'Kush Zebda', 'Dayri', 'Khadrawy', 'Halawy'. Bottom row (left to right): 'Abbada', 'Medjool', 'Thoory', 'Deglet Noor', 'Barhee'.

tensively exported from Iraq to American markets, but are not usually sold under the cultivar name. The soft, sticky, hydrated and pasteurized product has a recognizable 'Halawy' flavor, but like all processed dates that I have tasted, the treatment reduces dessert quality.

'Khadrawy'. The name 'Khadrawy' is said to mean "green" or "verdant," and the cultivar originated in Iraq. The fruit is early in maturity, below medium in size, oblong-ovate, and reddish brown. The flesh is soft and caramel-like with a rich, pleasant flavor. The palm of 'Khadrawy' is most distinctive because of its slow, vertical growth rate, equal to about half the growth rate of most other dates. 'Khadrawy' is precocious in fruiting, and, with its slow vertical growth rate, it comes closest to being a dwarf date palm.

'Amir Hajj'. This midseason, soft-type cultivar originated in Iraq and is comparatively rare and highly esteemed in that country. The name is said to mean "leader of the pilgrimage." Fruits are below medium in size, oblong-oval, and clear amber to reddish brown. Flesh of 'Amir Hajj' is very smooth and caramel-like in consistency and has a rich, not overly sweet flavor.

'Medjool'. 'Medjool' originated in Morocco, and the meaning of the

name is said to be "unknown." Fruit are of imposing appearance—large to very large, early maturing, oblong-ovate, and reddish brown. Flesh of 'Medjool' is somewhat firmer than that of most other soft dates. Many people consider the thick, caramel-like flesh to be high in quality. I rate 'Medjool' as good to above medium in quality and hardly as good as those mentioned above. 'Medjool' has many desirable attributes, such as fruit size, resistance to moisture damage, and early maturity, which makes it a valuable commercial variety, as well as a potential parent for use in date breeding. At one time, 'Medjool' was a leading commercial cultivar in Morocco, but has been almost wiped out by the bayoud disease.

'Abbada'. This cultivar originated from a chance seedling, presumably of 'Deglet Noor', found in a riverbed in Brawley, California, in 1936 by a Mr. Sniff. The early maturing fruit of 'Abbada' is strikingly handsome—black with a frostlike bloom. Fruit size is medium, rather slender, and oblong-ovate in shape; and the flesh is soft, melting, sweet, and somewhat cloying, with only medium quality.

'Thoory'. 'Thoory originated in Algeria, and the name is said to mean "bull's date." Fruits are medium to above medium, oblong, and light brown to light, greyish brown. 'Thoory' is a dry type with a firm but brittle flesh of pleasant, nutlike flavor. The flesh consistency differs markedly from that of the soft or semidry dates. Before a consumer can appreciate the unique qualities of dry date cultivars, he must become familiar with them. 'Thoory' matures its fruit late.

Of all date cultivars I have tasted, 'Deglet Noor', 'Kush Zebda' and 'Dayri' were the most flavorful.

The Technique of Budwood Grafting

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Three general techniques are used in seedless propagation of pome fruit trees. They are "June" budding, dormant budding, and grafting. Each has its season: spring to midsummer, midsummer till frost, and the dormant season, respectively. When possible, "June" budding is preferable to dormant budding, because a season of strong growth is usually obtained in the year of the bud insertion, rather than the material's having to be held dormant until the next season. Last year, a chance discovery made possible the benefits of both "June" budding and grafting during the dormant-budding season.

Conclusions from horticultural texts and manuals (1, 2, 3, 4, 5) indicate that most authors consider winter and spring to be the time to graft. The following quotations were noted:

"The time to graft is in the spring" (5),

"Deciduous trees are grafted in the winter (from January on), or not later than early spring just when the bark first slips well" (1),

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