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Rediscovering the Realm of Fruiting Mulberry Varieties

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Abstract

The fruiting mulberry tree, *Morus spp.*, was once admired as "easily the king of tree crops." Fruiting mulberry varieties of all three major species, *Morus nigra, Morus alba,* and *Morus rubra,* peaked in popularity in the United States around the turn of the century. Today, only black mulberries, *Morus nigra,* are grown commercially, and only in Europe and Turkey. Most of the recent mulberry breeding and production research has been directed towards silkworm forage rather than fruit. Fruiting mulberry varieties deserve to be rediscovered and improved for commercial production in the United States because the mulberry has many advantages as a fruit crop.

Introduction

The fruiting mulberry tree was once proclaimed by J. Russell Smith (27) as "easily the king of tree crops," but now it is referred to as the "tree that gets no respect" (23). A survey of literature today reveals that the king has truly lost his realm:

1). Fruiting mulberry varieties are rarely listed in nursery catalogs in the United States (See Appendix).

2). The mulberry tree is rarely discussed in fruit-growing texts (10).

3). Serious mulberry breeding and production research is mainly directed towards silkworm forage. Although China is still active in the silk industry, most of the available research reports are from the Soviet Union (1, 2, 19, 24), Japan (14, 21), and India (15, 16, 21, 22).

5). Very few articles have been directed towards the production or use of mulberry fruit. Researchers in Turkey have recently reported on the propagation (18) and fruit processing (11) of *Morus nigra* varieties. Although black mulberries are also reportedly (7, 8) grown commercially in Sicily, no research papers were available from Italy.

The Black Mulberry

The realm of fruiting mulberry varieties once included representatives from all three major species, *Morus nigra, Morus alba,* and *Morus rubra* (5, 9, 13). Both *M. alba* and *M. rubra* are simple diploids (2n=2x=28), but *M. nigra* has a very high ploidy level (2n=22x=308) which complicates mulberry breeding (28).

The universal favorite fruiting species has been the native mulberry of West Asia, *Morus nigra* (6). The black mulberry has been popular in England where it is considered "without equal for tarts, preserves and wine" (4). The fruits are often picked in the firmer, more acidic, red stage for baking (25). Although there have been several fruiting varieties developed in Europe (13), only the 'Black Persian' has been available in the United States (6). It has plump, 4 cm x 2.5 cm, black, juicy fruit with a rich, subacid flavor (7). It is adapted to the mild mediterranean climate (6) and only hardy south of USDA Zone 5.

The White Mulberry

The second most popular species for edible fruit has been the white mulberry, *Morus alba,* native to China (6). The majority of the white mulberry cultivars have been developed

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for silkworm forage. They are either fruitless or have dry, insipid, pale fruit. Two common types introduced to the United States were the very hardy Russian mulberry, 'Tartarica,' and the vigorous, but rather tender shrub form, *Morus alba* var. *multicaulis* (5). The fruiting varieties of white mulberry introduced in the United States were chance seedlings with superior fruit:

1). 'Downing's Everbearing,' 1846 in New York State, black, 4.5 cm x 1.5 cm, pleasant, subacid flavor. Selected from *M. alba.* var. *multicaulis* and too tender for the northern states (5).

2). 'New American,' 1854 in Connecticut, soon sold as 'Downing's Everbearing' in the north because it was similar but hardier (5). It is now considered the best fruiting mulberry hardy in the northern states (13, 28).

3). 'Trowbridge,' 1850's, chance *M. alba* seedling similar to 'New American' (5).

4). 'Thorburn,' 1850's, similar to 'New American' (5).

5). 'Ramsey White,' between 1875-1900, Texas, from 'Tartarica,' white, larger than the type (13).

6). 'Victoria,' similar to 'Ramsey White' in origin.

7). 'Munson,' 1900, Texas, "one of the largest, most prolific, and best of the Russian class" (13).

8). 'Merrit,' before 1910, Florida, where it ripens as early as April and continues for 8-10 weeks. Large, good flavor, precocious and productive (13).

The Red Mulberry

The red mulberry, *Morus rubra,* is native to moist bottomlands from Canada to Southern Texas (3). It is very hardy once established (13). Most forms become large trees, but *Morus rubra* var. *tomentosa* can remain shrub-like and spreading (13). The red mulberry has not been received well outside of the United States (26), although several superior fruiting selections have been made:

1). 'Johnson,' 1845, Ohio, perhaps the largest mulberry fruit ever described: 5 cm x 2 cm, black, pleasant, subacid. Not as productive as later selections (5).

2). 'Hick's Everbearing,' 1850, Georgia, produces over 14 weeks, medium size, insipidly sweet. Used for livestock and poultry forage (5).

3). 'Stubbs,' 1875, Georgia, superior to 'Hick's Everbearing' in size and flavor, introduced as "the most productive of all mulberries" (13).

4). 'Lampasas,' 1889, Texas, selected from *M. rubra* var. *tomentosa* for larger and "very good quality" fruit (13). A spreading shrub hardy only in USDA Zones 8-9.

5). 'Townsend,' about 1900, Florida, where it ripens as early as March, very productive, medium-sized fruit, mediocre flavor (13).

6). 'Travis,' about 1900, Texas, introduced as "the best of all mulberries for human food—very large and sweet" (13).

7). 'Illinois Everbearing' 1958, Illinois, introduced for its abundant, large, flavorful and nearly seedless fruit, a possible polyploid (9).

Mulberry Germplasm Today

Fruiting mulberry varieties deserve to be rediscovered and improved for commercial production in the United States because the mulberry has many advantages as a fruit crop:

1). It is easy to propagate, easy to transplant, rapid-growing, and precocious (4).

2). It can be grown in marginal areas: producing in frost pockets and wet or alkaline soils (27).

3). It is a reliable producer: even after a late frost kills the first crop, it will crop on secondary buds that same year (27).

4). It is long-lived: known to produce fruit with minimal care for as long as 300 years (25).

5). It is adaptable to high-density training systems by fruiting on new

wood after dormant shearing (6); coloring well even in shady areas of a hedge (5); and by being easily pollinated in dense rows by the wind (6).

The main drawbacks with fruiting mulberry trees which need to be overcome are:

1). The fruit is too soft to handle as a commercial fresh fruit crop (13).

2). The immature fruit abscise prematurely when shaken, and must be floated off after harvest (23).

3). The mulberry tree has a bad reputation as a weedy, invasive tree with staining, tasteless fruits which attract pesky birds (10,23,29).

Future fruiting mulberry varieties should be selected for firmer fruit, stronger abscission zones, fewer seeds (to prevent reseeding), and an irresistible flavor.

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APPENDIX

Swain (29) lists five nurseries which stock a few of the remaining fruiting mulberry varieties and others like The Fig Tree Nursery, P.0 Box 124, Gulf Hammock, FL 32639; Patrick's Vineyard, Orchard Nursery and Farm Market, Pomegranate Blvd., TyTy, GA 31795; and Bountiful Ridge, Nurseries, Inc., Princess Anne, MD 21853 also advertise mulberry varieties. In addition, budwood could be solicited via informal routes:

1). The "mulberry chairman" of the North American Fruit Explorers' Association, A. J. Bullard, 103 Smith Chapel, Mt. Olive, NC 28365.
2). Volunteer sources of mulberry germplasm, as listed on p. 267 of USDA Misc. Pub. #1406: Fogle, H. W., and H. F. Winters (eds.). 1981. North American and European fruit and tree nut germplasm resources inventory.
3). Members of the New York State Fruit Testing Cooperative Association, P.0. Box 462, Geneva, NY.
4). Readers of other fruit journals like the California Rare Fruit Growers' Journal.

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