

less space is required to grow and fruit the hybrids. Seedling trees of no value can be removed from the nursery. Trees of doubtful value can remain in the nursery and be evaluated the second or third year. Only the more promising trees are transplanted to the field.

Benlate can be recommended for the control of brown rot and scab of stone fruit. Sulfur when properly applied will provide effective disease control but Benlate provides added safety factors to aid the growers.

Peach and nectarine rust must be controlled for successful stone fruit production in North Central Florida. Rust control can be accomplished only when the fruit trees are properly fertilized and watered during the summer and early fall

months. Some growers have obtained commercial rust control with wettable sulfur, by maintaining a spray coverage of the foliage. This may require up to 20 spray applications and may be prohibitive in cost. Zineb appears to offer commercial control for the growers.

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THE STRAWBERRY TREE, MYRICA RUBRA, SIEB. AND ZUCC.

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Abstract. *Myrica rubra*, Sieb. and Zucc. was introduced as seed from Okinawa in 1953 and from southern Japan in 1959. Fruiting has been observed since 1965 in Gainesville. The plants are ornamental and fruits are of interest for jellies.

The common name, strawberry tree, has been applied to *Myrica rubra* Sieb. and Zucc. in the family *Myricaceae* (4), also to *Arbutus Unedo* L. in the *Ericaceae* family (1). The genus *Myrica* has several representatives in North America (2) including *M. cerifera* L., the wax myrtle, and *M. carolinensis* Mill, the bayberry. Bailey (1) does not list any *Myrica* species as cultivated plants.

There were at least 19 introductions of *M. rubra* by the U.S. Department of Agriculture from 1898 to 1927, 11 of which were from China and 5 from Japan. The principal distributions of plants from these introductions were 61 to Florida, 48 to California, 32 to Texas, and 19 to Georgia, according to a personal communication, dated Oct.

17, 1952, from Dr. W. E. Whitehouse, Division of Plant Exploration and Introduction, U.S.D.A., Beltsville, Md. As far as could be determined at that time, no plants survived in Florida.

One species from the Mediterranean area, *M. faya*, which was introduced into Hawaii as an ornamental has become a serious pest (3). It bears small edible red fruit, which are cherished by birds and the seed is disseminated in droppings.

Florida Importations

Okinawa. Seeds were obtained in 1953 during exchange of other plant material. It is listed there (4) as a common native plant on acid soils of low fertility. Common names given are strawberry tree in English, *Yama - momo* in Japanese, and *Mumi* in the Ryuku Islands. The fruit are eaten fresh or processed into pickles and wine; dye and drugs are extracted from the bark, and the trunks are used for posts. About 50 seedlings grown from seed were distributed in vicinities of Gainesville, Groveland, and Homestead. Dr. C. W. Campbell, Agricultural Research and Education Center, Homestead, Florida, stated in 1963 that the plants at Homestead were severely affected by iron chlorosis on the shallow limerock soils and had not survived. Other test plants have grown well, but have been injured in 17°F temperatures in the Gainesville area. Flowering has been in late January. Fruiting has been intermittent since 1965, because of frequent losses from frost.

Japan. Seeds were obtained in 1959 from the Tokushima Agricultural Experiment Station on Shikoku, through the assistance of Professor Y. Sakurai of Hyogo University of Agriculture. Seedlings from two cultivars, 'Kondo' and 'Birodo' have been grown in the Gainesville area. Bloom has been in late February, about 1 month later than the Okinawa source material. There has been regular fruiting of these since 1969, including the 1972 season following a very mild winter. Freeze damage to plants or fruit has been negligible. So far, 10 female plants have been rated for cropping and fruit quality. There have been only small differences in fruit of the seedlings. The fruit from this source were larger than from the Okinawa types. They ripen in early June about 1 month later than the Okinawa source and may have somewhat more resinous flavor in fresh fruit.

Plant and Fruit Characters

M. rubra fruit are the size of small sour cherries, with a seed of similar size, but with a roughened surface. They change from green through orange-red to dark red at full maturity. Hanging from the dark green branches, the fruit is strikingly attractive. When ripe, it is easily shaken from the branches. The fresh fruit has a slightly resinous odor and flavour and is very juicy and soft.

The plant is shrubby, resembling the native wax myrtle. It grows to at least 12' in height, is evergreen and quite ornamental. All of the plants observed have been very strongly dioecious, though a few predominantly male plants have borne scattered fruit.

Propagation of selected plants by rooting of softwood cuttings under mist has not been very satisfactory. In Japan, selected types are bark-grafted on seedlings according to a personal communication from Professor Sakurai in 1959. Seeds are stratified immediately after harvest, and sown the following spring. Our trials with stratified seed have been erratic, and further experience will be needed to assure good results. A few grafts have been made on native wax myrtle but insufficient time has elapsed to assure compatibility. There might be objectionable suckering of wax myrtle used for stocks. In contrast, *M. rubra* plants have not suckered any under our conditions.

Seeds which have fallen to the ground are quickly consumed by rodents. We have not seen any consumption of fruit by birds. For these reasons and lack of suckering, it has not been seen as an escape from cultivation.

The fruit can be harvested every 2 or 3 days by shaking, with a minimum number of immature fruit. About 3 harvests are necessary. Yields per plant have not been measured but have approximated 10 to 15 pounds per plant each of the past 4 seasons for the 1959 introduction. They were set at 3 ft. spacing in single rows.

Fruit Utilization

The fresh fruit has not been greatly esteemed by most samplers. It has been tested for jellies the past 3 seasons. To make jellies, the fruit was boiled a few minutes, after which the pulp was easily separated from the seeds by being passed through a ricer or pulper. One 550-g random sample of fruit gave a 65.8% recovery of pulp with 9.5% soluble solids content (by refractometer) and a pH of 3.0. The pulp was centrifuged to remove most of the suspended solids. Jelly was made using a standard formulation (45 parts juice: 55 parts sugar, 150-grade slow set pectin, and a final solids content of 65%) and poured into 10-oz clear plastic tumblers.

About 50 samples of the jelly were distributed, mostly within IFAS, along with a handout which explained about the *M. rubra* shrub and fruit and asked the respondents to indicate which of four statements best expressed their feelings. From forty-five recorded responses, 20 (44%) indicated their desire to have *M. rubra* shrubs in their yard. At least some of this group were more interested in the landscape use of the plants than in the fruit. Eight respondents (18%) indicated that they liked the jelly enough to make a special effort to get the fruit. The remaining 17 (38%) would use this jelly if available. No one indicated a dislike for the jelly.

Whereas the fruit has a distinctly resinous odor and flavor, only a trace of this comes through in the jelly, and it is easily masked by stronger flavors such as those of toast or peanut butter. The degree of liking for the jelly is probably dependent on taste acuity and conditions of use. Because the cooked *M. rubra* flavor is delicate, temperature of use is also important in its appreciation.

Further study of propagation methods is planned because of the possible value of this plant for landscape and home fruit in central and northern Florida.

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SENSORY EVALUATION OF PROCESSED OKLAWAHA AND FLORDAGRAND BLACKBERRIES

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Abstract. Jellies, jams, and preserves prepared from 'Oklawaha' (Ok) and 'Flordagrاند' (Fg) blackberries were rated at least as acceptable, and were sometimes preferred over, corresponding commercial products. The 2 cultivars appear to have equally good flavor.

Acceptability of Fg pie fillings was independent of fruit level but that of Ok fillings was inversely related to fruit level (55 to 75%). Removal of seeds from pie fillings had no effect on acceptability.

Florida has the potential for a considerable blackberry industry. If economic factors warranted it, production could easily be increased to supply five percent of the national and half of the Florida consumption of the fruit (3). Most of the present blackberry production in the state is marketed on a pick-it-yourself basis. Further expansion of production will depend on acceptance of Florida blackberries for processing.

Kuhn (5) found that jellies made from Ok and Fg blackberries were superior to jelly from 'Brazos' blackberries and to two commercially available jellies in flavor and general acceptance. So far as is known these cultivars, originated and grown in Florida, have never been evaluated as raw materials for other products.

The objects of this study were to (a) evaluate the processing potential of the cultivars Ok and Fg by comparing jams, jellies and preserves made from them with corresponding commercial products of good quality; (b) determine flavor preference for clear juice from the 2 cultivars; (c) determine how the acceptability of blackberry pie

filling was influenced by the amount of fruit contained, and whether the acceptability would be influenced by removal of all seeds.

Materials and Methods

Fg and Ok blackberries were picked at the Fla. Agr. Expt. Station's Horticultural Unit, Gainesville. At the Food Science Bldg., on campus, they were washed and sorted to remove immature and defective fruit. They were frozen at -29°C either as whole berries or as seedless puree and stored for one year, until utilized. Prior to use they were thawed, the whole fruit in a pan set in warm water, the puree in a steam kettle with only moderate heating.

Tasting of juice samples occurred within two days of preparation. All the other products were sealed in glass jars and stored 1-3 weeks at laboratory temperatures ($22-25^{\circ}\text{C}$) until required for taste panel evaluation.

Standard 45:55 (fruit: sugar) jams, jellies and preserves were prepared in the laboratory using conventional formulations (1). The jam was prepared from seedless puree, while a 40:60 mixture of whole fruit and puree was used in preserves. Clear juice was prepared from puree by centrifugation and incorporated into jelly. These products representing Ok and Fg cultivars were compared with each other and with a corresponding commercial product (C) by sensory panels made up of 15 Food Science Dept. personnel, using a composite complete-incomplete block design (2). Of the 4 samples tasted each day, 3 were Fg, Ok and C and the 4th was a replication of one of the 3. On each of 2 days each 5 judges received a replication of a different sample. The replicated samples were rotated among the judges so that no panelist received replications of the same sample on successive days of testing. The relative acceptability of each sample compared to a reference sample was indicated on a 9-point scale (4). The data was subjected to the analysis of variance devised by Cornell (2).

In order to compare the flavor of Ok and Fg

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